STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

May 16, 2024

Jeffrey Barbadora
Permitting Specialist
Crown Castle
1800 West Park Drive
Westborough, MA 01581
Jeff.Barbadora@crowncastle.com

RE: **EM-VER-130A-231004** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 1432 Old Waterbury Road, Southbury, Connecticut.
Request for Project Change.

Dear Jeffrey Barbadora:

The Connecticut Siting Council (Council) is in receipt of the correspondence dated May 9, 2024 and the associated Structural Analysis dated October 20, 2023, regarding a project change for the above-referenced exempt modification request acknowledged by the Council on November 13, 2023.

Pursuant to Condition No. 1 of the Council's November 13, 2023 exempt modification approval, the request to increase the number of Kaelus interference mitigation filters to be installed from two to four is hereby approved.

This approval applies only to the project change in the correspondence dated May 8, 2024.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/ANM/laf

c: The Honorable Jeff Manville, First Selectperson, Town of Southbury (selectman@southbury-ct.gov)

From: Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>
Sent: Thursday, May 9, 2024 10:13 AM
To: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: EM-VER-130A-231004 - 1432 Old Waterbury Road Southbury CT - 806358

Good morning,

Would the CSC please update the approval for EM-VER-130A-231004 to include a total of 4 filters?

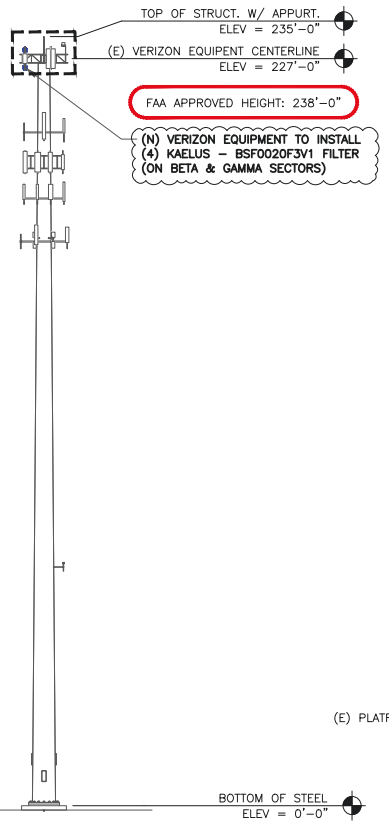
The original SA submitted with the application and dated 8/30/2023 stated only 2 filters and should have stated 4 filters.

Please see updated SA stating a total of 4 filters and let me know if you have any questions.

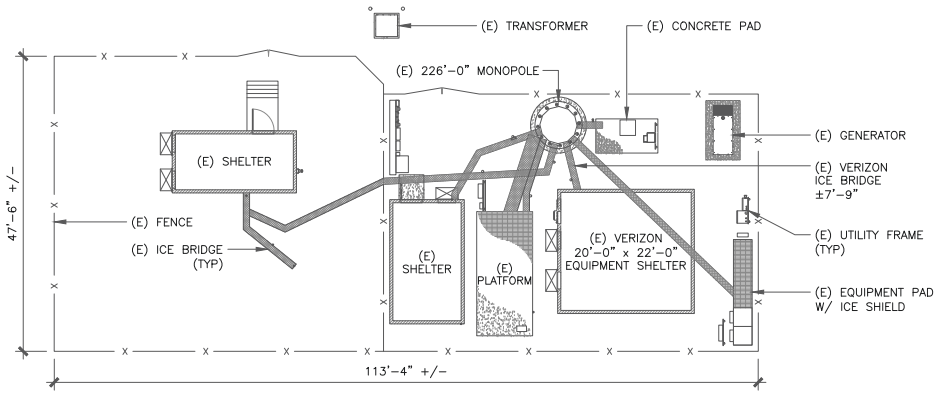
Thanks,

Jeffrey Barbadora
Permitting Specialist
781-970-0053

Crown Castle
1800 W. Park Drive, Suite 250
Westborough, MA 01581



1 FINAL TOWER ELEVATION
SCALE: NOT TO SCALE



3 FINAL SITE PLAN
SCALE: 0' 10' 20' 30' 40' 1"=20'

N

NOTE:
AN ANALYSIS OF THE CAPACITY OF THE STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS NOT BEEN COMPLETED BY CROWN CASTLE. DRAWINGS ARE SUBJECT TO CHANGE PENDING OUTCOME OF A STRUCTURAL ANALYSIS.

LEASE EXHIBIT:
THIS LEASE EXHIBIT IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF THE SITE SURVEY AND FACILITY DESIGN.

verizon

CROWN CASTLE

VERIZON SITE NUMBER:
5000386016

BU #: **806358**

CROWN CASTLE SITE NAME
NHV 109 943107
VERIZON SITE NAME
SOUTHBURY CT

1432 OLD WATERBURY ROAD
SOUTHBURY, CT 06488

EXISTING 226'-0"
MONOPOLE

ISSUED FOR:

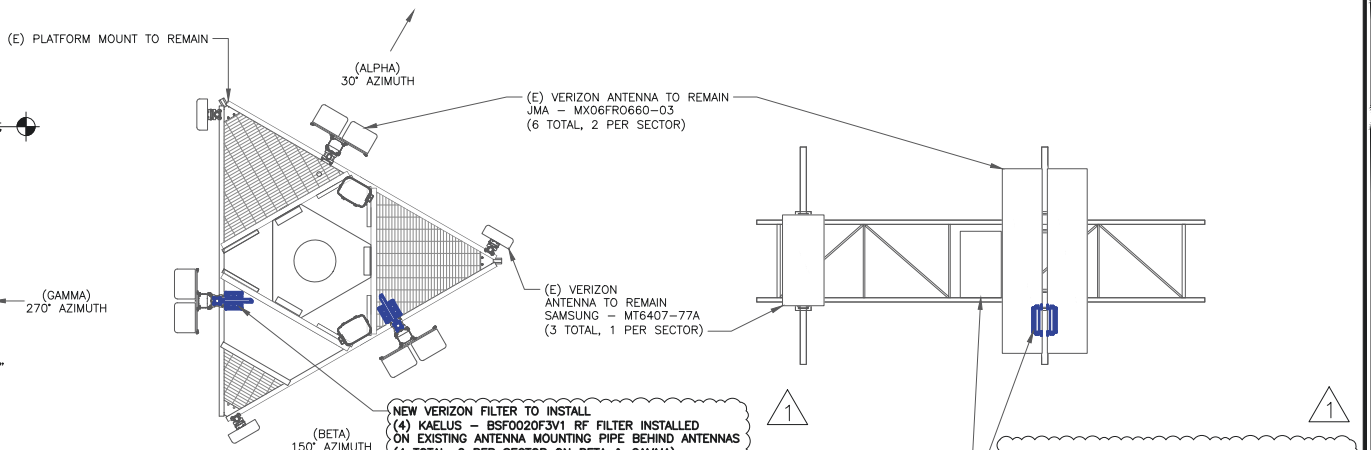
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/28/24	MDW	LEASE EXHIBIT	MD
1	4/12/24	WS	LEASE EXHIBIT	MB

DocuSigned by:
Mahan Barimani
6DB7630923AD4B1...

4/12/2024 | 9:58:11 AM CDT

CROWN CASTLE USA INC.
CERTIFICATE OF REGISTRATION #PEC.0001101

SHEET NUMBER: LE-1
REVISION: 1



2 LOCATION MAP
SCALE: NOT TO SCALE

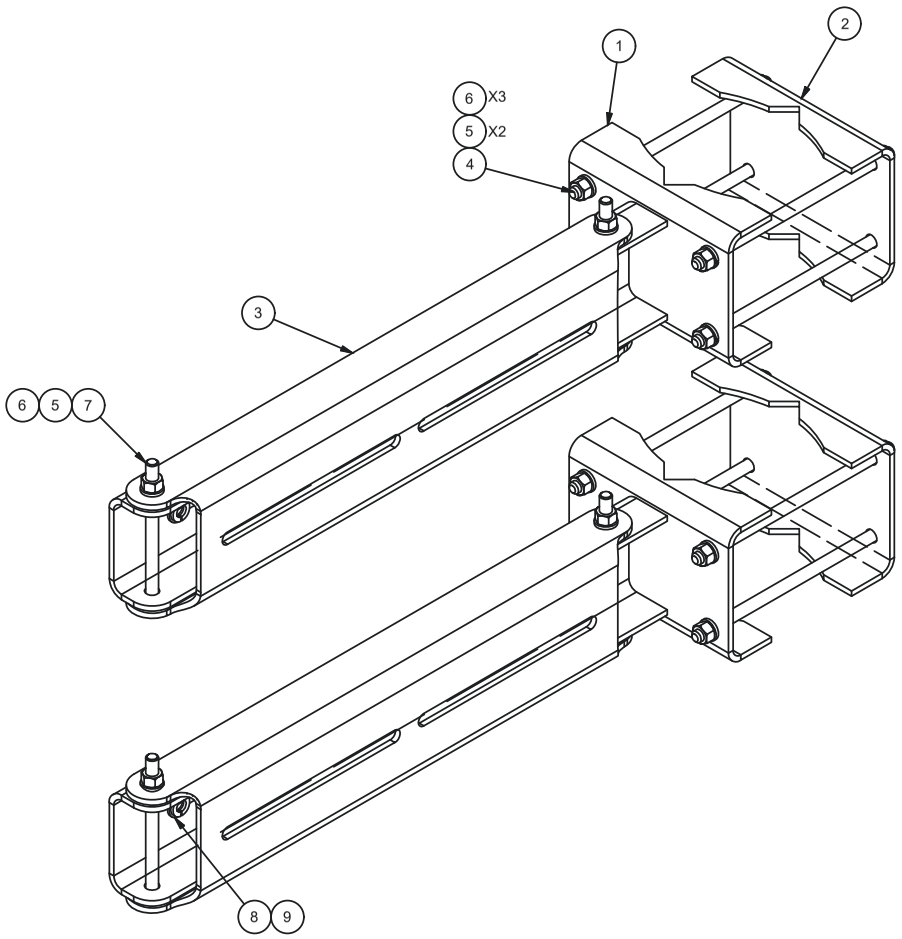
N

4 FINAL ANTENNA PLAN
SCALE: 0' 1' 4' 8' 16'

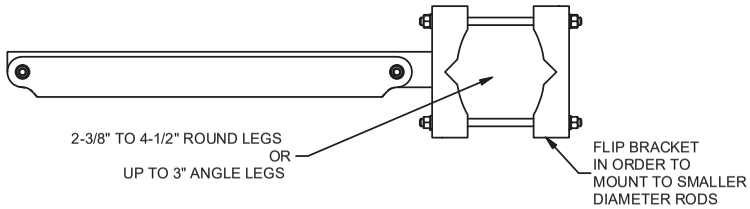
N

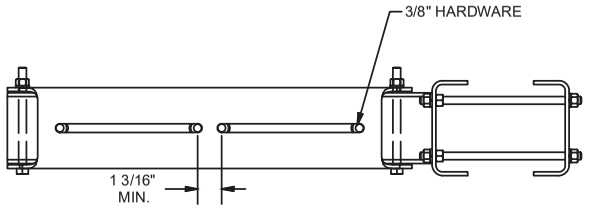
5 FINAL RF FILTER ELEVATION
SCALE: 0' 1' 2' 4' 10'

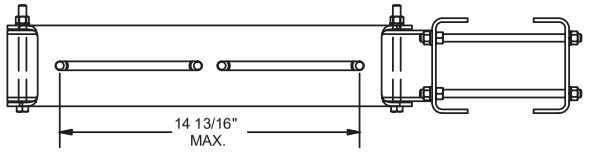
+608/325Ã,5914671Ã.+'Ä-(%,!!)-Ä!"" Ã#&(*Å&%$$Å!(&#&+%,*#*%



PARTS LIST					
ITEM	QTY	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	MOUNTING ARM		8.99	17.97
2	2	CLAMP PLATE		2.35	4.69
3	2	SWIVEL MOUNT		6.65	13.30
4	8	3/8"-16 UNC X 8" GALV. THREADED ROD		0.25	2.00
5	20	3/8" GALV LOCK WASHER		0.01	0.13
6	28	3/8"-16 UNC GALV HEX NUT		0.02	0.52
7	4	3/8" X 5" GALV BOLT		0.18	0.71
8	8	3/8" SS FLAT WASHER		0.01	0.06
9	8	3/8" SS LOCK WASHER		0.01	0.05
				TOTAL WT. #	39.43







TOLERANCE NOTES

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

DESCRIPTION
RRU
DUAL SWIVEL MOUNT

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/12/2015		RRUDSM

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	SHOP	BMC 2/3/2015	RRUDSM

DocuSign

Certificate Of Completion

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Subject: Complete with DocuSign: SOUTHBURY_CT_LE_328_20240412.pdf
Source Envelope:
Document Pages: 2
Certificate Pages: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Signatures: 1
Initials: 0

Status: Completed

Envelope Originator:
Trista Bonomi
2000 Corporate Drive
Canonsburg, PA 15317
Trista.Bonomi@crowncastle.com
IP Address: 4.78.157.2

Record Tracking

Status: Original
4/12/2024 9:56:21 AM

Holder: Trista Bonomi
Trista.Bonomi@crowncastle.com

Location: DocuSign

Signer Events	Signature	Timestamp
Maham Barimani Maham.Barimani@crowncastle.com Security Level: Email, Account Authentication (None)	DocuSigned by: Maham Barimani 6DB7630923AD4B1... Signature Adoption: Pre-selected Style Using IP Address: 64.213.130.18	Sent: 4/12/2024 9:57:38 AM Viewed: 4/12/2024 9:58:01 AM Signed: 4/12/2024 9:58:11 AM

Electronic Record and Signature Disclosure:
Not Offered via DocuSign

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	4/12/2024 9:57:38 AM
Certified Delivered	Security Checked	4/12/2024 9:58:01 AM
Signing Complete	Security Checked	4/12/2024 9:58:11 AM
Completed	Security Checked	4/12/2024 9:58:11 AM

Payment Events	Status	Timestamps

Date: **October 20, 2023**

MORRISON HERSHFIELD

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Site Number:	5000386016
	Site Name:	Southbury CT
Crown Castle Designation:	**BU Number:**	806358
	Site Name:	NHV 109 943107
	JDE Job Number:	2103494
	Work Order Number:	2265250
	Order Number:	658817 Rev. 0
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN12-647R1 / 2300001	
Site Data:	**1432 Old Waterbury Road, Southbury, New Haven County, CT 06488** **Latitude *41° 29' 36.92"*, Longitude *-73° 9' 54.98"*** **225.79 Foot – EEI Monopole Tower**	

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity – 59%**

This analysis utilizes an ultimate 3-second gust wind speed of 116 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. 28133)
Senior Engineer

EXP 1/31/2024

Digitally signed by G. Lance Cooke
Date: 2023.10.20 17:36:04+05'30'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 225.79 ft monopole tower designed by Engineered Endeavors, Inc.

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

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	116 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1 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)
228.0	230.0	2	raycap	RRFDC-3315-PF-48	14	1-5/8
	228.0	6	jma wireless	MX06FRO660-03		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RF4439D-25A		
		3	samsung telecommunications	RF4440D-13A		
		4	kaelus	BSF0020F3V1		
		3	-	JMA Wireless 91900314 Dual-Mount Antenna Bracket		
		1	-	Platform Mount (LP 101-1)		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
218.0	218.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/4
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	-	Commscope MC-PK8-DSH		
205.0	207.0	3	commscope	VV-65A-R1_TMO w/ Mount Pipe	3	1-5/8
		3	ericsson	AIR6449 B41 w/ Mount Pipe		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	205.0	1	-	Site Pro 1 HRK12-HD Handrail Kit		
		1	-	Platform Mount [LP 712-1]		
196.0	196.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	12 6 2 2	1-1/4 5/8 3/8 Conduit
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		3	kathrein	800 10121 w/ Mount Pipe		
		3	kathrein	80010798 w/ Mount Pipe		
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4426 B66		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	cci antennas	DTMABP7819VG12A		
		3	kaelus	DBC0061F1V51-2		
		6	kathrein	860 10025		
		3	raycap	DC6-48-60-18-8F		
		1	-	Sector Mount [SM 504-3]		
185.0	187.0	3	decibel	978QNB120E-M w/ Mount Pipe	6 1	1-5/8 1/2
		6	ems wireless	FV90-16-02DP w/ Mount Pipe		
		3	rfs celwave	APXV18-206517S-C w/ Mount Pipe		
		3	nokia	CS72993.07		
	185.0	1	-	Platform Mount [LP 712-1]		
173.0	173.0	3	alcatel lucent	1900MHz RRH (65MHz)	-	-
		3	alcatel lucent	800MHZ RRH		
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER		
		9	rfs celwave	ACU-A20-N		
		1	-	Side Arm Mount [SO 102-3]		
172.0	173.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	4	1-1/4
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	alcatel lucent	TD-RRH8x20-25		
	172.0	1	-	Platform Mount [LP 1201-1]		
72.0	73.0	1	gps	GPS_A	1	1/2
	72.0	1	-	Side Arm Mount [SO 702-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	217688	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	821496	CCISITES
4-TOWER MANUFACTURER DRAWINGS	821494	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	1276594	CCISITES
4-POST-MODIFICATION INSPECTION	1863184	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4062841	CCISITES
4-POST-MODIFICATION INSPECTION	4062849	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	225.79 - 197.75	Pole	TP28.6563x21.5x0.1875	1	-12.03	1002.63	38.0	Pass
L2	197.75 - 162.72	Pole	TP37.0938x27.24x0.375	2	-29.40	2589.87	42.5	Pass
L3	162.72 - 120.09	Pole	TP47.1563x35.0487x0.4375	3	-43.15	3846.79	51.9	Pass
L4	120.09 - 78.99	Pole	TP56.6563x44.6617x0.5	4	-60.52	5287.57	51.2	Pass
L5	78.99 - 38.92	Pole	TP65.7813x53.7418x0.5625	5	-82.53	6910.70	48.0	Pass
L6	38.92 - 0	Pole	TP74.5x62.453x0.5625	6	-113.65	8108.48	51.0	Pass
							Summary	
						Pole (L3)	51.9	Pass
						Rating =	51.9	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	54.7	Pass
1	Base Plate		38.7	Pass
1, 2	Base Foundation (Compared w/ Design Loads)	0	59.0	Pass

Structure Rating (max from all components) =	59%*

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

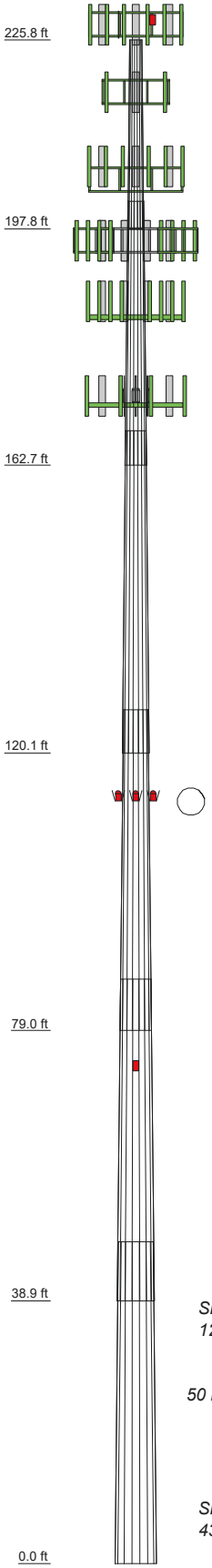
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	28.04	18	0.1875	4.08	21.5000	28.6563	A572-65	1.4
2	39.11	18	0.3750	5.14	27.2400	37.0938		5.0
3	47.77	18	0.4375	6.39	35.0487	47.1563		9.2
4	47.49	18	0.5000	7.58	44.6617	56.6563		12.9
5	47.65	18	0.5625	8.72	53.7418	65.7813		17.1
6	47.64	18	0.5625		62.4530	74.5000		19.7
								65.3



ALL REACTIONS ARE FACTORED

AXIAL 154 K

SHEAR 12 K

MOMENT 2086 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 114 K

SHEAR 43 K

MOMENT 7061 kip-ft

TORQUE 2 kip-ft
REACTIONS - 116 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 116 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 51.9%

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

Job:	***CN12-647R1 / 2300001***		
Project:	***806358 / NHV 109 943107***		
Client: Crown Castle USA	Drawn by: CKK		App'd:
Code: TIA-222-H	Date: 10/20/23		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

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

- Tower is located in New Haven County, Connecticut.
- Tower base elevation above sea level: 666.00 ft.
- Basic wind speed of 116 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	225.79-197.75	28.04	4.08	18	21.5000	28.6563	0.1875	0.7500	A572-65 (65 ksi)
L2	197.75-162.72	39.11	5.14	18	27.2400	37.0938	0.3750	1.5000	A572-65 (65 ksi)
L3	162.72-120.09	47.77	6.39	18	35.0487	47.1563	0.4375	1.7500	A572-65 (65 ksi)
L4	120.09-78.99	47.49	7.58	18	44.6617	56.6563	0.5000	2.0000	A572-65 (65 ksi)
L5	78.99-38.92	47.65	8.72	18	53.7418	65.7813	0.5625	2.2500	A572-65 (65 ksi)
L6	38.92-0.00	47.64		18	62.4530	74.5000	0.5625	2.2500	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	It/Q in^2	w in	w/t
L1	21.8027	12.6836	727.8616	7.5659	10.9220	66.6418	1456.6810	6.3430	3.4540	18.421
	29.0694	16.9425	1734.8057	10.1064	14.5574	119.1702	3471.8941	8.4728	4.7135	25.139
L2	28.6462	31.9760	2915.6454	9.5371	13.8379	210.6999	5835.1273	15.9911	4.1342	11.025
	37.6081	43.7045	7444.5646	13.0352	18.8436	395.0707	14898.9250	21.8564	5.8685	15.649
L3	36.8448	48.0620	7274.0007	12.2870	17.8048	408.5427	14557.5727	24.0356	5.3986	12.34
	47.8162	64.8748	17889.4123	16.5852	23.9554	746.7807	35802.3639	32.4436	7.5295	17.21
L4	46.9123	70.0846	17268.3561	15.6774	22.6881	761.1185	34559.4344	35.0489	6.9805	13.961
	57.4531	89.1200	35506.5661	19.9355	28.7814	1233.6647	71059.8527	44.5685	9.0915	18.183
L5	56.4288	94.9449	33922.9724	18.8786	27.3008	1242.5625	67890.5816	47.4815	8.4686	15.055
	66.7093	116.4399	62572.6159	23.1527	33.4169	1872.4856	125227.5665	58.2310	10.5875	18.822
L6	65.5688	110.4978	53473.5626	21.9711	31.7261	1685.4739	107017.4870	55.2594	10.0017	17.781
	75.5625	132.0062	91171.9378	26.2478	37.8460	2409.0244	182463.8419	66.0156	12.1220	21.55

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 225.79-197.75				1	1	1			
L2 197.75-162.72				1	1	1			
L3 162.72-120.09				1	1	1			
L4 120.09-78.99				1	1	1			
L5 78.99-38.92				1	1	1			
L6 38.92-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
Safety Line 3/8"	A	No	Surface Ar (CaAa)	225.79 - 0.00	1	1	0.250 0.250	0.3750		0.22
Step Pegs	A	No	Surface Ar (CaAa)	225.79 - 0.00	1	1	0.200 0.300	0.3500		0.45
HB158-1-08U8-	C	No	Surface Ar	225.79 -	2	2	0.206	1.9800		1.30

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
S8J18(1-5/8)			(CaAa)	0.00			0.270			
***										
CU12PSM6P4XXX(1-3/4)	A	No	Surface Ar (CaAa)	218.00 - 0.00	1	1	-0.170 -0.170	1.7500		2.72
LDF6-50A(1-1/4)	A	No	Surface Ar (CaAa)	196.00 - 0.00	3	3	-0.270 -0.190	1.5500		0.60
***										
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	185.00 - 0.00	6	6	0.270 0.480	1.9800		0.82
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	185.00 - 0.00	1	1	0.490 0.490	0.6250		0.15
***										
LDF4-50A(1/2)	A	No	Surface Ar (CaAa)	72.00 - 0.00	1	1	-0.150 -0.150	0.6250		0.15
***										
FP 6"x1"	A	No	Surface Af (CaAa)	134.00 - 124.00	1	1	0.000 0.000	6.0000	14.0000	20.41
FP 6"x1"	B	No	Surface Af (CaAa)	134.00 - 124.00	1	1	0.000 0.000	6.0000	14.0000	20.41
FP 6"x1"	C	No	Surface Af (CaAa)	134.00 - 124.00	1	1	0.000 0.000	6.0000	14.0000	20.41
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	225.79 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
***									
*									
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Inside Pole	205.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.50 2.50 2.50
***									
LDF6-50A(1-1/4)	A	No	No	Inside Pole	196.00 - 0.00	9	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.60 0.60 0.60
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	196.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
WR-VG82ST-BRDA(5/8)	A	No	No	Inside Pole	196.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.31 0.31 0.31
WR-VG82ST-BRDA(5/8)	A	No	No	Inside Pole	196.00 - 0.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.31 0.31 0.31
CONDUIT(2)	A	No	No	Inside Pole	196.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.80 2.80 2.80
***									
HB114-1-0813U4-M5J(1-1/4)	B	No	No	Inside Pole	172.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.20 1.20 1.20
HB114-21U3M12-XXXF(1-1/4)	B	No	No	Inside Pole	172.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.22 1.22 1.22
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	225.79-197.75	A	0.000	0.000	5.577	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	11.104	0.000	0.35
L2	197.75-162.72	A	0.000	0.000	24.145	0.000	0.61
		B	0.000	0.000	0.000	0.000	0.31
		C	0.000	0.000	41.733	0.000	0.55
L3	162.72-120.09	A	0.000	0.000	39.495	0.000	0.98
		B	0.000	0.000	9.121	0.000	0.73
		C	0.000	0.000	79.312	0.000	0.95
L4	120.09-78.99	A	0.000	0.000	29.284	0.000	0.75
		B	0.000	0.000	0.000	0.000	0.51
		C	0.000	0.000	67.671	0.000	0.72
L5	78.99-38.92	A	0.000	0.000	30.617	0.000	0.73
		B	0.000	0.000	0.000	0.000	0.49
		C	0.000	0.000	65.975	0.000	0.70
L6	38.92-0.00	A	0.000	0.000	30.163	0.000	0.71
		B	0.000	0.000	0.000	0.000	0.48
		C	0.000	0.000	64.082	0.000	0.68

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	225.79-197.75	A	1.023	0.000	0.000	21.199	0.000	0.24
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	21.053	0.000	0.51
L2	197.75-162.72	A	1.007	0.000	0.000	58.036	0.000	1.06
		B		0.000	0.000	0.000	0.000	0.31
		C		0.000	0.000	71.040	0.000	1.09
L3	162.72-120.09	A	0.983	0.000	0.000	82.030	0.000	1.59
		B		0.000	0.000	10.215	0.000	0.80
		C		0.000	0.000	127.334	0.000	1.90
L4	120.09-78.99	A	0.949	0.000	0.000	68.391	0.000	1.25
		B		0.000	0.000	0.000	0.000	0.51
		C		0.000	0.000	112.218	0.000	1.55
L5	78.99-38.92	A	0.901	0.000	0.000	73.870	0.000	1.26
		B		0.000	0.000	0.000	0.000	0.49
		C		0.000	0.000	108.457	0.000	1.48
L6	38.92-0.00	A	0.804	0.000	0.000	71.495	0.000	1.20
		B		0.000	0.000	0.000	0.000	0.48
		C		0.000	0.000	104.032	0.000	1.39

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	225.79-197.75	-2.2201	1.6869	-2.4549	0.6258
L2	197.75-162.72	-6.3492	3.6493	-5.5704	2.2019
L3	162.72-120.09	-6.8540	4.3548	-6.3985	3.0210
L4	120.09-78.99	-8.4479	5.3613	-7.6251	3.6130
L5	78.99-38.92	-9.1685	5.5982	-8.6025	3.7498
L6	38.92-0.00	-9.6507	5.8461	-9.1595	3.9812

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Safety Line 3/8"	197.75 - 225.79	1.0000	1.0000
L1	3	Step Pegs	197.75 - 225.79	1.0000	1.0000
L1	6	HB158-1-08U8-S8J18(1-5/8)	197.75 - 225.79	1.0000	1.0000
L1	8	CU12PSM6P4XXX(1-3/4)	197.75 - 218.00	1.0000	1.0000
L2	2	Safety Line 3/8"	162.72 - 197.75	1.0000	1.0000
L2	3	Step Pegs	162.72 - 197.75	1.0000	1.0000
L2	6	HB158-1-08U8-S8J18(1-5/8)	162.72 - 197.75	1.0000	1.0000
L2	8	CU12PSM6P4XXX(1-3/4)	162.72 - 197.75	1.0000	1.0000
L2	16	LDF6-50A(1-1/4)	162.72 - 196.00	1.0000	1.0000
L2	22	LDF7-50A(1-5/8)	162.72 - 185.00	1.0000	1.0000
L2	23	LDF4-50A(1/2)	162.72 - 185.00	1.0000	1.0000
L3	2	Safety Line 3/8"	120.09 - 162.72	1.0000	1.0000
L3	3	Step Pegs	120.09 - 162.72	1.0000	1.0000
L3	6	HB158-1-08U8-S8J18(1-5/8)	120.09 - 162.72	1.0000	1.0000
L3	8	CU12PSM6P4XXX(1-3/4)	120.09 - 162.72	1.0000	1.0000
L3	16	LDF6-50A(1-1/4)	120.09 - 162.72	1.0000	1.0000
L3	22	LDF7-50A(1-5/8)	120.09 - 162.72	1.0000	1.0000
L3	23	LDF4-50A(1/2)	120.09 - 162.72	1.0000	1.0000
L3	30	FP 6"x1"	124.00 - 134.00	1.0000	1.0000
L3	31	FP 6"x1"	124.00 - 134.00	1.0000	1.0000
L3	32	FP 6"x1"	124.00 - 134.00	1.0000	1.0000
L4	2	Safety Line 3/8"	78.99 - 120.09	1.0000	1.0000
L4	3	Step Pegs	78.99 - 120.09	1.0000	1.0000
L4	6	HB158-1-08U8-S8J18(1-5/8)	78.99 - 120.09	1.0000	1.0000
L4	8	CU12PSM6P4XXX(1-3/4)	78.99 - 120.09	1.0000	1.0000
L4	16	LDF6-50A(1-1/4)	78.99 - 120.09	1.0000	1.0000
L4	22	LDF7-50A(1-5/8)	78.99 - 120.09	1.0000	1.0000
L4	23	LDF4-50A(1/2)	78.99 - 120.09	1.0000	1.0000
L5	2	Safety Line 3/8"	38.92 - 78.99	1.0000	1.0000
L5	3	Step Pegs	38.92 - 78.99	1.0000	1.0000
L5	6	HB158-1-08U8-S8J18(1-5/8)	38.92 - 78.99	1.0000	1.0000
L5	8	CU12PSM6P4XXX(1-3/4)	38.92 - 78.99	1.0000	1.0000
L5	16	LDF6-50A(1-1/4)	38.92 - 78.99	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L5	22	LDF7-50A(1-5/8)	38.92 - 78.99	1.0000	1.0000
L5	23	LDF4-50A(1/2)	38.92 - 78.99	1.0000	1.0000
L5	28	LDF4-50A(1/2)	38.92 - 72.00	1.0000	1.0000
L6	2	Safety Line 3/8"	0.00 - 38.92	1.0000	1.0000
L6	3	Step Pegs	0.00 - 38.92	1.0000	1.0000
L6	6	HB158-1-08U8-S8J18(1-5/8)	0.00 - 38.92	1.0000	1.0000
L6	8	CU12PSM6P4XXX(1-3/4)	0.00 - 38.92	1.0000	1.0000
L6	16	LDF6-50A(1-1/4)	0.00 - 38.92	1.0000	1.0000
L6	22	LDF7-50A(1-5/8)	0.00 - 38.92	1.0000	1.0000
L6	23	LDF4-50A(1/2)	0.00 - 38.92	1.0000	1.0000
L6	28	LDF4-50A(1/2)	0.00 - 38.92	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	30	FP 6"x1"	124.00 - 134.00	Auto	0.0000
L3	31	FP 6"x1"	124.00 - 134.00	Auto	0.0000
L3	32	FP 6"x1"	124.00 - 134.00	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
Lighting Rod 5/8" x 5'	C	From Leg	2.00 0.00 2.00	0.0000	226.00	No Ice 1/2" Ice 1" Ice	0.31 0.83 1.32	0.31 0.83 1.32	0.03 0.03 0.04
Flash Beacon Lighting	B	From Leg	2.00 0.00 2.00	0.0000	226.00	No Ice 1/2" Ice 1" Ice	2.70 3.10 3.50	2.70 3.10 3.50	0.05 0.07 0.09
Side Light	A	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
Side Light	B	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
Side Light	C	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
***									
RRFDC-3315-PF-48	B	From Leg	4.00 0.00 2.00	0.0000	228.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.30	2.51 2.73 2.95	0.03 0.06 0.10
RRFDC-3315-PF-48	C	From Leg	4.00 0.00 2.00	0.0000	228.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.30	2.51 2.73 2.95	0.03 0.06 0.10
4' x 2" Pipe Mount	A	From Leg	4.00 0.00	0.0000	228.00	No Ice 1/2" Ice	0.79 1.03	0.79 1.03	0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				0.00				1" Ice	1.28	1.28	0.04
4' x 2" Pipe Mount	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.79	0.79	0.03
				0.00				1/2" Ice	1.03	1.03	0.04
				0.00				1" Ice	1.28	1.28	0.04
4' x 2" Pipe Mount	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.79	0.79	0.03
				0.00				1/2" Ice	1.03	1.03	0.04
				0.00				1" Ice	1.28	1.28	0.04
2' x 2" Pipe Mount	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.02	0.02	0.01
				0.00				1/2" Ice	0.05	0.05	0.01
				0.00				1" Ice	0.09	0.09	0.01
2' x 2" Pipe Mount	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.02	0.02	0.01
				0.00				1/2" Ice	0.05	0.05	0.01
				0.00				1" Ice	0.09	0.09	0.01
2' x 2" Pipe Mount	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.02	0.02	0.01
				0.00				1/2" Ice	0.05	0.05	0.01
				0.00				1" Ice	0.09	0.09	0.01
Transition Ladder	C	From Leg	2.00	0.00		0.0000	228.00	No Ice	6.00	6.00	0.16
				0.00				1/2" Ice	8.00	8.00	0.24
				-2.00				1" Ice	10.00	10.00	0.32
Platform Mount (LP 101-1)	A	None				0.0000	228.00	No Ice	35.83	35.83	1.50
								1/2" Ice	40.98	40.98	2.32
								1" Ice	46.57	46.57	3.26
*											
(2) MX06FRO660-03	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	6.81	4.67	0.08
				0.00				1/2" Ice	7.37	5.19	0.15
				0.00				1" Ice	7.93	5.73	0.22
(2) MX06FRO660-03	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	6.81	4.67	0.08
				0.00				1/2" Ice	7.37	5.19	0.15
				0.00				1" Ice	7.93	5.73	0.22
(2) MX06FRO660-03	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	6.81	4.67	0.08
				0.00				1/2" Ice	7.37	5.19	0.15
				0.00				1" Ice	7.93	5.73	0.22
MT6407-77A w/ Mount Pipe	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	5.94	3.10	0.10
				0.00				1/2" Ice	6.47	3.55	0.13
				0.00				1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	5.94	3.10	0.10
				0.00				1/2" Ice	6.47	3.55	0.13
				0.00				1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	5.94	3.10	0.10
				0.00				1/2" Ice	6.47	3.55	0.13
				0.00				1" Ice	7.02	4.02	0.18
(2) BSF0020F3V1	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.96	0.29	0.02
				0.00				1/2" Ice	1.09	0.36	0.02
				0.00				1" Ice	1.22	0.45	0.03
(2) BSF0020F3V1	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	0.96	0.29	0.02
				0.00				1/2" Ice	1.09	0.36	0.02
				0.00				1" Ice	1.22	0.45	0.03
RF4439D-25A	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.25	0.07
				0.00				1/2" Ice	2.03	1.39	0.09
				0.00				1" Ice	2.21	1.54	0.11
RF4439D-25A	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.25	0.07
				0.00				1/2" Ice	2.03	1.39	0.09
				0.00				1" Ice	2.21	1.54	0.11
RF4439D-25A	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.25	0.07
				0.00				1/2" Ice	2.03	1.39	0.09
				0.00				1" Ice	2.21	1.54	0.11
RF4440D-13A	A	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.13	0.07
				0.00				1/2" Ice	2.03	1.27	0.09
				0.00				1" Ice	2.21	1.41	0.11
RF4440D-13A	B	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.13	0.07
				0.00				1/2" Ice	2.03	1.27	0.09
				0.00				1" Ice	2.21	1.41	0.11
RF4440D-13A	C	From Leg	4.00	0.00		0.0000	228.00	No Ice	1.87	1.13	0.07
				0.00				1/2" Ice	2.03	1.27	0.09
				0.00				1" Ice	2.21	1.41	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
JMA Wireless 91900314	A	From Leg	4.00		0.0000	228.00	No Ice	2.30	2.30	0.07
Dual-Mount Antenna Bracket			0.00				1/2" Ice	3.13	3.13	0.10
			0.00				1" Ice	3.62	3.62	0.13
JMA Wireless 91900314	B	From Leg	4.00		0.0000	228.00	No Ice	2.30	2.30	0.07
Dual-Mount Antenna Bracket			0.00				1/2" Ice	3.13	3.13	0.10
			0.00				1" Ice	3.62	3.62	0.13
JMA Wireless 91900314	C	From Leg	4.00		0.0000	228.00	No Ice	2.30	2.30	0.07
Dual-Mount Antenna Bracket			0.00				1/2" Ice	3.13	3.13	0.10
			0.00				1" Ice	3.62	3.62	0.13
***										
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00		0.0000	218.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00		0.0000	218.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00		0.0000	218.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
TA08025-B604	A	From Leg	4.00		0.0000	218.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B604	B	From Leg	4.00		0.0000	218.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B604	C	From Leg	4.00		0.0000	218.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B605	A	From Leg	4.00		0.0000	218.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
TA08025-B605	B	From Leg	4.00		0.0000	218.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
TA08025-B605	C	From Leg	4.00		0.0000	218.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
RDIDC-9181-PF-48	A	From Leg	2.00		0.0000	218.00	No Ice	2.01	1.17	0.02
			0.00				1/2" Ice	2.19	1.31	0.04
			0.00				1" Ice	2.37	1.46	0.06
6' x 2" Mount Pipe	A	From Leg	2.00		0.0000	218.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
(2) 8' x 2" Mount Pipe	A	From Leg	4.00		0.0000	218.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00		0.0000	218.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00		0.0000	218.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
Commscope MC-PK8-DSH	A	None			0.0000	218.00	No Ice	34.24	34.24	1.75
							1/2" Ice	62.95	62.95	2.10
							1" Ice	91.66	91.66	2.45
***										
Transition Ladder	C	From Leg	2.00		0.0000	205.00	No Ice	6.00	6.00	0.16
			0.00				1/2" Ice	8.00	8.00	0.24
			-2.00				1" Ice	10.00	10.00	0.32
Platform Mount [LP 712-1]	A	None			0.0000	205.00	No Ice	24.56	24.56	1.34
							1/2" Ice	27.92	27.92	1.91
							1" Ice	31.27	31.27	2.55
*										
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	205.00	No Ice	4.46	2.69	0.05
			0.00				1/2" Ice	4.91	3.10	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	4.46 4.91	2.69 3.10	0.05 0.10
			2.00			1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	4.46 4.91	2.69 3.10	0.05 0.10
			2.00			1" Ice	5.36	3.52	0.15
AIR6449 B41 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	5.18 5.59	2.72 3.05	0.12 0.16
			2.00			1" Ice	6.01	3.39	0.22
AIR6449 B41 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	5.18 5.59	2.72 3.05	0.12 0.16
			2.00			1" Ice	6.01	3.39	0.22
AIR6449 B41 w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	5.18 5.59	2.72 3.05	0.12 0.16
			2.00			1" Ice	6.01	3.39	0.22
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	14.69 15.46	6.87 7.55	0.18 0.31
			2.00			1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	14.69 15.46	6.87 7.55	0.18 0.31
			2.00			1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	14.69 15.46	6.87 7.55	0.18 0.31
			2.00			1" Ice	16.23	8.25	0.45
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.14 2.32	1.69 1.85	0.11 0.13
			2.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.14 2.32	1.69 1.85	0.11 0.13
			2.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.14 2.32	1.69 1.85	0.11 0.13
			2.00			1" Ice	2.51	2.02	0.16
Radio 4480_TMOV2	A	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.88 3.09	1.40 1.56	0.08 0.10
			2.00			1" Ice	3.31	1.73	0.13
Radio 4480_TMOV2	B	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.88 3.09	1.40 1.56	0.08 0.10
			2.00			1" Ice	3.31	1.73	0.13
Radio 4480_TMOV2	C	From Leg	4.00 0.00	0.0000	205.00	No Ice 1/2" Ice	2.88 3.09	1.40 1.56	0.08 0.10
			2.00			1" Ice	3.31	1.73	0.13
Site Pro 1 HRK12-HD Handrail Kit	A	None		0.0000	205.00	No Ice 1/2" Ice 1" Ice	6.36 8.52 10.62	6.36 8.52 10.62	0.41 0.55 0.69
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OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	9.19 9.94	6.21 6.93	0.11 0.18
			0.00			1" Ice	10.71	7.66	0.26
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	9.19 9.94	6.21 6.93	0.11 0.18
			0.00			1" Ice	10.71	7.66	0.26
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	9.19 9.94	6.21 6.93	0.11 0.18
			0.00			1" Ice	10.71	7.66	0.26
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	12.25 13.00	6.05 6.71	0.09 0.18
			0.00			1" Ice	13.76	7.39	0.27
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	12.25 13.00	6.05 6.71	0.09 0.18
			0.00			1" Ice	13.76	7.39	0.27
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	196.00	No Ice 1/2" Ice	12.25 13.00	6.05 6.71	0.09 0.18
			0.00			1" Ice	13.76	7.39	0.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.0000	196.00	No Ice	3.60	2.95	0.07
			0.00			1/2" Ice	4.00	3.34	0.11
			0.00			1" Ice	4.42	3.74	0.17
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	196.00	No Ice	3.60	2.95	0.07
			0.00			1/2" Ice	4.00	3.34	0.11
			0.00			1" Ice	4.42	3.74	0.17
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	196.00	No Ice	3.60	2.95	0.07
			0.00			1/2" Ice	4.00	3.34	0.11
			0.00			1" Ice	4.42	3.74	0.17
80010798 w/ Mount Pipe	A	From Leg	4.00	0.0000	196.00	No Ice	7.79	4.90	0.11
			0.00			1/2" Ice	8.40	5.47	0.19
			0.00			1" Ice	9.02	6.06	0.27
80010798 w/ Mount Pipe	B	From Leg	4.00	0.0000	196.00	No Ice	7.79	4.90	0.11
			0.00			1/2" Ice	8.40	5.47	0.19
			0.00			1" Ice	9.02	6.06	0.27
80010798 w/ Mount Pipe	C	From Leg	4.00	0.0000	196.00	No Ice	7.79	4.90	0.11
			0.00			1/2" Ice	8.40	5.47	0.19
			0.00			1" Ice	9.02	6.06	0.27
RRUS 11 B12	A	From Leg	4.00	0.0000	196.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	196.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	196.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 32 B2	A	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32 B30	A	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32 B30	B	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32 B30	C	From Leg	4.00	0.0000	196.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 4426 B66	A	From Leg	4.00	0.0000	196.00	No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			1" Ice	1.97	0.97	0.08
RRUS 4426 B66	B	From Leg	4.00	0.0000	196.00	No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			1" Ice	1.97	0.97	0.08
RRUS 4426 B66	C	From Leg	4.00	0.0000	196.00	No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			1" Ice	1.97	0.97	0.08
RRUS 4478 B14_CCIV2	A	From Leg	4.00	0.0000	196.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478 B14_CCIV2	B	From Leg	4.00	0.0000	196.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478 B14_CCIV2	C	From Leg	4.00	0.0000	196.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
DTMABP7819VG12A	A	From Leg	4.00	0.0000	196.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	1.23	0.51	0.04
DTMABP7819VG12A	B	From Leg	4.00	0.0000	196.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			0.00			1" Ice	1.23	0.51	0.04
DTMABP7819VG12A	C	From Leg	4.00	0.0000	196.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			0.00			1" Ice	1.23	0.51	0.04
DBC0061F1V51-2	A	From Leg	4.00	0.0000	196.00	No Ice	0.43	0.41	0.03
			0.00			1/2" Ice	0.51	0.50	0.03
			0.00			1" Ice	0.61	0.59	0.04
DBC0061F1V51-2	B	From Leg	4.00	0.0000	196.00	No Ice	0.43	0.41	0.03
			0.00			1/2" Ice	0.51	0.50	0.03
			0.00			1" Ice	0.61	0.59	0.04
DBC0061F1V51-2	C	From Leg	4.00	0.0000	196.00	No Ice	0.43	0.41	0.03
			0.00			1/2" Ice	0.51	0.50	0.03
			0.00			1" Ice	0.61	0.59	0.04
(2) 860 10025	A	From Leg	4.00	0.0000	196.00	No Ice	0.14	0.12	0.00
			0.00			1/2" Ice	0.20	0.17	0.00
			0.00			1" Ice	0.26	0.23	0.01
(2) 860 10025	B	From Leg	4.00	0.0000	196.00	No Ice	0.14	0.12	0.00
			0.00			1/2" Ice	0.20	0.17	0.00
			0.00			1" Ice	0.26	0.23	0.01
(2) 860 10025	C	From Leg	4.00	0.0000	196.00	No Ice	0.14	0.12	0.00
			0.00			1/2" Ice	0.20	0.17	0.00
			0.00			1" Ice	0.26	0.23	0.01
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	196.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8F	B	From Leg	1.00	0.0000	196.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8F	C	From Leg	1.00	0.0000	196.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
Sector Mount [SM 504-3]	A	None		0.0000	196.00	No Ice	31.05	31.05	1.71
						1/2" Ice	43.83	43.83	2.33
						1" Ice	56.44	56.44	3.14
***									
978QNB120E-M w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	7.83	5.15	0.06
			0.00			1/2" Ice	8.28	5.92	0.12
			2.00			1" Ice	8.74	6.61	0.19
978QNB120E-M w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	7.83	5.15	0.06
			0.00			1/2" Ice	8.28	5.92	0.12
			2.00			1" Ice	8.74	6.61	0.19
978QNB120E-M w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	7.83	5.15	0.06
			0.00			1/2" Ice	8.28	5.92	0.12
			2.00			1" Ice	8.74	6.61	0.19
(2) FV90-16-02DP w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	4.47	2.92	0.04
			0.00			1/2" Ice	5.08	3.50	0.07
			2.00			1" Ice	5.70	4.10	0.11
(2) FV90-16-02DP w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	4.47	2.92	0.04
			0.00			1/2" Ice	5.08	3.50	0.07
			2.00			1" Ice	5.70	4.10	0.11
(2) FV90-16-02DP w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	4.47	2.92	0.04
			0.00			1/2" Ice	5.08	3.50	0.07
			2.00			1" Ice	5.70	4.10	0.11
APXV18-206517S-C w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
			2.00			1" Ice	4.99	4.35	0.15
APXV18-206517S-C w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
			2.00			1" Ice	4.99	4.35	0.15
APXV18-206517S-C w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
			2.00			1" Ice	4.99	4.35	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
CS72993.07	A	From Leg	4.00		0.0000	185.00	No Ice	1.23	0.39	0.02
			0.00				1/2" Ice	1.36	0.48	0.03
			2.00				1" Ice	1.51	0.59	0.04
CS72993.07	B	From Leg	4.00		0.0000	185.00	No Ice	1.23	0.39	0.02
			0.00				1/2" Ice	1.36	0.48	0.03
			2.00				1" Ice	1.51	0.59	0.04
CS72993.07	C	From Leg	4.00		0.0000	185.00	No Ice	1.23	0.39	0.02
			0.00				1/2" Ice	1.36	0.48	0.03
			2.00				1" Ice	1.51	0.59	0.04
Transition Ladder	C	From Leg	2.00		0.0000	185.00	No Ice	6.00	6.00	0.16
			0.00				1/2" Ice	8.00	8.00	0.24
			-2.00				1" Ice	10.00	10.00	0.32
Platform Mount [LP 712-1]	A	None			0.0000	185.00	No Ice	24.56	24.56	1.34
							1/2" Ice	27.92	27.92	1.91
							1" Ice	31.27	31.27	2.55
******										
1900MHz RRH (65MHz)	A	From Leg	1.00		0.0000	173.00	No Ice	2.31	2.38	0.06
			0.00				1/2" Ice	2.52	2.58	0.08
			0.00				1" Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	B	From Leg	1.00		0.0000	173.00	No Ice	2.31	2.38	0.06
			0.00				1/2" Ice	2.52	2.58	0.08
			0.00				1" Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	C	From Leg	1.00		0.0000	173.00	No Ice	2.31	2.38	0.06
			0.00				1/2" Ice	2.52	2.58	0.08
			0.00				1" Ice	2.73	2.79	0.11
800MHZ RRH	A	From Leg	1.00		0.0000	173.00	No Ice	2.13	1.77	0.05
			0.00				1/2" Ice	2.32	1.95	0.07
			0.00				1" Ice	2.51	2.13	0.10
800MHZ RRH	B	From Leg	1.00		0.0000	173.00	No Ice	2.13	1.77	0.05
			0.00				1/2" Ice	2.32	1.95	0.07
			0.00				1" Ice	2.51	2.13	0.10
800MHZ RRH	C	From Leg	1.00		0.0000	173.00	No Ice	2.13	1.77	0.05
			0.00				1/2" Ice	2.32	1.95	0.07
			0.00				1" Ice	2.51	2.13	0.10
800 EXTERNAL NOTCH FILTER	A	From Leg	1.00		0.0000	173.00	No Ice	0.66	0.32	0.01
			0.00				1/2" Ice	0.76	0.40	0.02
			0.00				1" Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	1.00		0.0000	173.00	No Ice	0.66	0.32	0.01
			0.00				1/2" Ice	0.76	0.40	0.02
			0.00				1" Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	1.00		0.0000	173.00	No Ice	0.66	0.32	0.01
			0.00				1/2" Ice	0.76	0.40	0.02
			0.00				1" Ice	0.87	0.48	0.02
(3) ACU-A20-N	A	From Leg	1.00		0.0000	173.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				1" Ice	0.15	0.21	0.00
(3) ACU-A20-N	B	From Leg	1.00		0.0000	173.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				1" Ice	0.15	0.21	0.00
(3) ACU-A20-N	C	From Leg	1.00		0.0000	173.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				1" Ice	0.15	0.21	0.00
6' x 2" Mount Pipe	A	From Leg	0.50		0.0000	173.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	B	From Leg	0.50		0.0000	173.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	C	From Leg	0.50		0.0000	173.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
			0.00				1" Ice	2.29	2.29	0.05
Side Arm Mount [SO 102-3]	A	None			0.0000	173.00	No Ice	3.60	3.60	0.07
							1/2" Ice	4.18	4.18	0.11
							1" Ice	4.75	4.75	0.14
***										

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
Platform Mount [LP 1201-1]	A	None		0.0000	172.00	No Ice 1/2" Ice 1" Ice	18.38 22.11 25.87	18.38 22.11 25.87	2.10 2.65 3.26
***									
GPS_A	A	From Leg	6.00 0.00 1.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
Side Arm Mount [SO 702-1]	A	From Leg	3.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.62 0.74 0.89	1.49 2.07 2.54	0.03 0.04 0.06
***									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice

Comb. No.	Description
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	225.79 - 197.75	Pole	Max Tension	45	0.00	-0.00	0.00
			Max. Compression	26	-23.63	1.72	-1.48
			Max. Mx	20	-12.04	228.96	0.07
			Max. My	14	-12.04	0.10	-228.50
			Max. Vy	20	-14.30	228.96	0.07
			Max. Vx	14	14.30	0.10	-228.50
			Max. Torque	22			1.46
L2	197.75 - 162.72	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.70	3.76	-2.95
			Max. Mx	20	-29.41	984.59	0.41
			Max. My	14	-29.41	0.03	-983.91
			Max. Vy	20	-28.55	984.59	0.41
			Max. Vx	14	28.56	0.03	-983.91
			Max. Torque	25			2.14
L3	162.72 - 120.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.82	5.32	-4.74
			Max. Mx	20	-43.15	2244.56	0.99
			Max. My	14	-43.15	-0.58	-2244.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-32.29	2244.56	0.99
			Max. Vx	14	32.29	-0.58	-2244.00
			Max. Torque	25			2.14
L4	120.09 - 78.99	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.78	6.89	-6.67
			Max. Mx	20	-60.52	3610.94	1.47
			Max. My	14	-60.52	-1.11	-3610.53
			Max. Vy	20	-36.04	3610.94	1.47
			Max. Vx	14	36.05	-1.11	-3610.53
			Max. Torque	25			2.13
L5	78.99 - 38.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117.70	8.54	-8.12
			Max. Mx	20	-82.53	5087.57	2.02
			Max. My	14	-82.53	-1.54	-5086.47
			Max. Vy	20	-39.58	5087.57	2.02
			Max. Vx	14	39.56	-1.54	-5086.47
			Max. Torque	25			2.13
L6	38.92 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-153.53	10.82	-10.64
			Max. Mx	20	-113.65	7058.25	2.36
			Max. My	14	-113.65	-1.95	-7056.09
			Max. Vy	20	-42.91	7058.25	2.36
			Max. Vx	14	42.89	-1.95	-7056.09
			Max. Torque	25			1.97

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	153.53	12.42	0.01
	Max. H_x	20	113.67	42.87	0.02
	Max. H_z	2	113.67	0.02	42.85
	Max. M_x	2	7048.80	0.02	42.85
	Max. M_z	8	7050.14	-42.87	-0.02
	Max. Torsion	25	1.97	21.46	37.12
	Min. Vert	5	85.25	-21.41	37.09
	Min. H_x	8	113.67	-42.87	-0.02
	Min. H_z	14	113.67	-0.02	-42.85
	Min. M_x	14	-7056.09	-0.02	-42.85
	Min. M_z	20	-7058.25	42.87	0.02
	Min. Torsion	13	-1.95	-21.46	-37.12

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	94.72	0.00	0.00	2.86	3.17	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	113.67	-0.02	-42.85	-7048.80	10.05	-1.57
0.9 Dead+1.0 Wind 0 deg - No Ice	85.25	-0.02	-42.85	-6937.31	8.85	-1.57
1.2 Dead+1.0 Wind 30 deg - No Ice	113.67	21.41	-37.09	-6100.98	-3517.86	-0.74
0.9 Dead+1.0 Wind 30 deg - No Ice	85.25	21.41	-37.09	-6004.60	-3462.80	-0.75
1.2 Dead+1.0 Wind 60 deg - No Ice	113.67	37.11	-21.40	-3517.40	-6102.08	0.27

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
0.9 Dead+1.0 Wind 60 deg - No Ice	85.25	37.11	-21.40	-3462.23	-6005.81	0.27
1.2 Dead+1.0 Wind 90 deg - No Ice	113.67	42.87	0.02	9.63	-7050.14	1.21
0.9 Dead+1.0 Wind 90 deg - No Ice	85.25	42.87	0.02	8.55	-6938.74	1.21
1.2 Dead+1.0 Wind 120 deg - No Ice	113.67	37.14	21.44	3535.05	-6108.05	1.82
0.9 Dead+1.0 Wind 120 deg - No Ice	85.25	37.14	21.44	3477.75	-6011.66	1.82
1.2 Dead+1.0 Wind 150 deg - No Ice	113.67	21.46	37.12	6114.23	-3528.24	1.95
0.9 Dead+1.0 Wind 150 deg - No Ice	85.25	21.46	37.12	6015.81	-3472.98	1.95
1.2 Dead+1.0 Wind 180 deg - No Ice	113.67	0.02	42.85	7056.09	-1.95	1.56
0.9 Dead+1.0 Wind 180 deg - No Ice	85.25	0.02	42.85	6942.67	-2.91	1.56
1.2 Dead+1.0 Wind 210 deg - No Ice	113.67	-21.41	37.09	6108.27	3525.97	0.75
0.9 Dead+1.0 Wind 210 deg - No Ice	85.25	-21.41	37.09	6009.96	3468.75	0.76
1.2 Dead+1.0 Wind 240 deg - No Ice	113.67	-37.11	21.40	3524.68	6110.20	-0.25
0.9 Dead+1.0 Wind 240 deg - No Ice	85.25	-37.11	21.40	3467.59	6011.76	-0.25
1.2 Dead+1.0 Wind 270 deg - No Ice	113.67	-42.87	-0.02	-2.36	7058.25	-1.20
0.9 Dead+1.0 Wind 270 deg - No Ice	85.25	-42.87	-0.02	-3.21	6944.70	-1.20
1.2 Dead+1.0 Wind 300 deg - No Ice	113.67	-37.14	-21.44	-3527.78	6116.15	-1.83
0.9 Dead+1.0 Wind 300 deg - No Ice	85.25	-37.14	-21.44	-3472.41	6017.61	-1.83
1.2 Dead+1.0 Wind 330 deg - No Ice	113.67	-21.46	-37.12	-6106.95	3536.33	-1.97
0.9 Dead+1.0 Wind 330 deg - No Ice	85.25	-21.46	-37.12	-6010.46	3478.92	-1.97
1.2 Dead+1.0 Ice+1.0 Temp	153.53	-0.00	0.00	10.64	10.82	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	153.53	-0.01	-12.42	-2061.02	12.52	-0.53
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	153.53	6.21	-10.75	-1782.75	-1023.91	-0.28
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	153.53	10.76	-6.20	-1023.86	-1783.00	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	153.53	12.42	0.01	12.33	-2061.33	0.36
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	153.53	10.76	6.21	1048.15	-1784.33	0.57
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	153.53	6.22	10.75	1806.07	-1026.23	0.63
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	153.53	0.01	12.42	2082.99	9.84	0.53
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	153.53	-6.21	10.75	1804.73	1046.28	0.28
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	153.53	-10.76	6.20	1045.83	1805.36	-0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	153.53	-12.42	-0.01	9.65	2083.69	-0.36
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	153.53	-10.76	-6.21	-1026.17	1806.70	-0.57
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	153.53	-6.22	-10.75	-1784.09	1048.60	-0.64
Dead+Wind 0 deg - Service	94.72	-0.01	-10.80	-1758.15	4.85	-0.40
Dead+Wind 30 deg - Service	94.72	5.40	-9.35	-1521.47	-876.16	-0.19
Dead+Wind 60 deg - Service	94.72	9.36	-5.39	-876.28	-1521.51	0.07
Dead+Wind 90 deg - Service	94.72	10.81	0.01	4.51	-1758.25	0.31
Dead+Wind 120 deg - Service	94.72	9.36	5.41	884.90	-1523.00	0.47

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 150 deg - Service	94.72	5.41	9.36	1528.99	-878.75	0.50
Dead+Wind 180 deg - Service	94.72	0.01	10.80	1764.18	1.86	0.40
Dead+Wind 210 deg - Service	94.72	-5.40	9.35	1527.50	882.87	0.19
Dead+Wind 240 deg - Service	94.72	-9.36	5.39	882.31	1528.22	-0.07
Dead+Wind 270 deg - Service	94.72	-10.81	-0.01	1.52	1764.95	-0.31
Dead+Wind 300 deg - Service	94.72	-9.36	-5.41	-878.87	1529.71	-0.47
Dead+Wind 330 deg - Service	94.72	-5.41	-9.36	-1522.96	885.46	-0.50

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-94.72	0.00	0.00	94.72	0.00	0.000%
2	-0.02	-113.67	-42.85	0.02	113.67	42.85	0.000%
3	-0.02	-85.25	-42.85	0.02	85.25	42.85	0.000%
4	21.41	-113.67	-37.09	-21.41	113.67	37.09	0.000%
5	21.41	-85.25	-37.09	-21.41	85.25	37.09	0.000%
6	37.11	-113.67	-21.40	-37.11	113.67	21.40	0.000%
7	37.11	-85.25	-21.40	-37.11	85.25	21.40	0.000%
8	42.87	-113.67	0.02	-42.87	113.67	-0.02	0.000%
9	42.87	-85.25	0.02	-42.87	85.25	-0.02	0.000%
10	37.14	-113.67	21.44	-37.14	113.67	-21.44	0.000%
11	37.14	-85.25	21.44	-37.14	85.25	-21.44	0.000%
12	21.46	-113.67	37.12	-21.46	113.67	-37.12	0.000%
13	21.46	-85.25	37.12	-21.46	85.25	-37.12	0.000%
14	0.02	-113.67	42.85	-0.02	113.67	-42.85	0.000%
15	0.02	-85.25	42.85	-0.02	85.25	-42.85	0.000%
16	-21.41	-113.67	37.09	21.41	113.67	-37.09	0.000%
17	-21.41	-85.25	37.09	21.41	85.25	-37.09	0.000%
18	-37.11	-113.67	21.40	37.11	113.67	-21.40	0.000%
19	-37.11	-85.25	21.40	37.11	85.25	-21.40	0.000%
20	-42.87	-113.67	-0.02	42.87	113.67	0.02	0.000%
21	-42.87	-85.25	-0.02	42.87	85.25	0.02	0.000%
22	-37.14	-113.67	-21.44	37.14	113.67	21.44	0.000%
23	-37.14	-85.25	-21.44	37.14	85.25	21.44	0.000%
24	-21.46	-113.67	-37.12	21.46	113.67	37.12	0.000%
25	-21.46	-85.25	-37.12	21.46	85.25	37.12	0.000%
26	0.00	-153.53	0.00	0.00	153.53	-0.00	0.000%
27	-0.01	-153.53	-12.42	0.01	153.53	12.42	0.000%
28	6.21	-153.53	-10.75	-6.21	153.53	10.75	0.000%
29	10.76	-153.53	-6.20	-10.76	153.53	6.20	0.000%
30	12.42	-153.53	0.01	-12.42	153.53	-0.01	0.000%
31	10.76	-153.53	6.21	-10.76	153.53	-6.21	0.000%
32	6.22	-153.53	10.75	-6.22	153.53	-10.75	0.000%
33	0.01	-153.53	12.42	-0.01	153.53	-12.42	0.000%
34	-6.21	-153.53	10.75	6.21	153.53	-10.75	0.000%
35	-10.76	-153.53	6.20	10.76	153.53	-6.20	0.000%
36	-12.42	-153.53	-0.01	12.42	153.53	0.01	0.000%
37	-10.76	-153.53	-6.21	10.76	153.53	6.21	0.000%
38	-6.22	-153.53	-10.75	6.22	153.53	10.75	0.000%
39	-0.01	-94.72	-10.80	0.01	94.72	10.80	0.000%
40	5.40	-94.72	-9.35	-5.40	94.72	9.35	0.000%
41	9.36	-94.72	-5.39	-9.36	94.72	5.39	0.000%
42	10.81	-94.72	0.01	-10.81	94.72	-0.01	0.000%
43	9.36	-94.72	5.41	-9.36	94.72	-5.41	0.000%
44	5.41	-94.72	9.36	-5.41	94.72	-9.36	0.000%
45	0.01	-94.72	10.80	-0.01	94.72	-10.80	0.000%
46	-5.40	-94.72	9.35	5.40	94.72	-9.35	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
47	-9.36	-94.72	5.39	9.36	94.72	-5.39	0.000%
48	-10.81	-94.72	-0.01	10.81	94.72	0.01	0.000%
49	-9.36	-94.72	-5.41	9.36	94.72	5.41	0.000%
50	-5.41	-94.72	-9.36	5.41	94.72	9.36	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00016363
3	Yes	5	0.00000001	0.00007963
4	Yes	6	0.00000001	0.00037299
5	Yes	6	0.00000001	0.00012981
6	Yes	6	0.00000001	0.00037302
7	Yes	6	0.00000001	0.00012985
8	Yes	5	0.00000001	0.00016361
9	Yes	5	0.00000001	0.00007927
10	Yes	6	0.00000001	0.00038538
11	Yes	6	0.00000001	0.00013432
12	Yes	6	0.00000001	0.00037077
13	Yes	6	0.00000001	0.00012864
14	Yes	5	0.00000001	0.00013953
15	Yes	5	0.00000001	0.00006740
16	Yes	6	0.00000001	0.00037909
17	Yes	6	0.00000001	0.00013188
18	Yes	6	0.00000001	0.00037900
19	Yes	6	0.00000001	0.00013182
20	Yes	5	0.00000001	0.00013980
21	Yes	5	0.00000001	0.00006719
22	Yes	6	0.00000001	0.00037089
23	Yes	6	0.00000001	0.00012867
24	Yes	6	0.00000001	0.00038557
25	Yes	6	0.00000001	0.00013438
26	Yes	4	0.00000001	0.00007719
27	Yes	6	0.00000001	0.00014374
28	Yes	6	0.00000001	0.00018725
29	Yes	6	0.00000001	0.00018743
30	Yes	6	0.00000001	0.00014362
31	Yes	6	0.00000001	0.00019264
32	Yes	6	0.00000001	0.00018974
33	Yes	6	0.00000001	0.00014565
34	Yes	6	0.00000001	0.00019432
35	Yes	6	0.00000001	0.00019412
36	Yes	6	0.00000001	0.00014570
37	Yes	6	0.00000001	0.00019006
38	Yes	6	0.00000001	0.00019298
39	Yes	4	0.00000001	0.00021949
40	Yes	5	0.00000001	0.00007919
41	Yes	5	0.00000001	0.00007925
42	Yes	4	0.00000001	0.00021931
43	Yes	5	0.00000001	0.00008686
44	Yes	5	0.00000001	0.00007762
45	Yes	4	0.00000001	0.00021772
46	Yes	5	0.00000001	0.00008361
47	Yes	5	0.00000001	0.00008356
48	Yes	4	0.00000001	0.00021782
49	Yes	5	0.00000001	0.00007781
50	Yes	5	0.00000001	0.00008705

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	225.79 - 197.75	36.737	48	1.6333	0.0044
L2	201.83 - 162.72	28.811	48	1.4893	0.0024
L3	167.86 - 120.09	19.071	48	1.2130	0.0013
L4	126.48 - 78.99	10.161	48	0.8209	0.0006
L5	86.57 - 38.92	4.556	48	0.5046	0.0003
L6	47.64 - 0	1.375	48	0.2611	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
228.00	RRFDC-3315-PF-48	48	36.737	1.6333	0.0044	33475
226.00	Lighting Rod 5/8" x 5'	48	36.737	1.6333	0.0044	33475
218.00	MX08FRO665-21 w/ Mount Pipe	48	34.112	1.5890	0.0037	21486
205.00	Transition Ladder	48	29.824	1.5103	0.0026	8065
196.00	OPA-65R-LCUU-H6 w/ Mount Pipe	48	26.992	1.4483	0.0021	6846
185.00	978QNB120E-M w/ Mount Pipe	48	23.723	1.3628	0.0017	6598
173.00	1900MHz RRH (65MHz)	48	20.408	1.2598	0.0014	6346
172.00	APXVTM14-C-120 w/ Mount Pipe	48	20.144	1.2508	0.0013	6326
113.00	Side Light	48	7.968	0.7048	0.0004	6878
72.00	GPS_A	48	3.110	0.4078	0.0002	8414

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	225.79 - 197.75	147.016	20	6.5388	0.0172
L2	201.83 - 162.72	115.342	20	5.9680	0.0094
L3	167.86 - 120.09	76.377	22	4.8639	0.0049
L4	126.48 - 78.99	40.704	22	3.2918	0.0022
L5	86.57 - 38.92	18.247	22	2.0223	0.0010
L6	47.64 - 0	5.504	22	1.0455	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
228.00	RRFDC-3315-PF-48	20	147.016	6.5388	0.0174	8606
226.00	Lighting Rod 5/8" x 5'	20	147.016	6.5388	0.0174	8606
218.00	MX08FRO665-21 w/ Mount Pipe	20	136.529	6.3641	0.0145	5523
205.00	Transition Ladder	20	119.393	6.0515	0.0103	2070
196.00	OPA-65R-LCUU-H6 w/ Mount Pipe	20	108.068	5.8043	0.0083	1752
185.00	978QNB120E-M w/ Mount Pipe	20	94.993	5.4633	0.0066	1681
173.00	1900MHz RRH (65MHz)	20	81.728	5.0510	0.0054	1610
172.00	APXVTM14-C-120 w/ Mount Pipe	20	80.671	5.0150	0.0053	1604
113.00	Side Light	22	31.918	2.8257	0.0017	1723
72.00	GPS_A	22	12.454	1.6339	0.0008	2102

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	225.79 - 197.75 (1)	TP28.6563x21.5x0.1875	28.04	0.00	0.0	16.3228	-12.03	954.88	0.013
L2	197.75 - 162.72 (2)	TP37.0938x27.24x0.375	39.11	0.00	0.0	42.1631	-29.40	2466.54	0.012
L3	162.72 - 120.09 (3)	TP47.1563x35.0487x0.4375	47.77	0.00	0.0	62.6258	-43.15	3663.61	0.012
L4	120.09 - 78.99 (4)	TP56.6563x44.6617x0.5	47.49	0.00	0.0	86.0817	-60.52	5035.78	0.012
L5	78.99 - 38.92 (5)	TP65.7813x53.7418x0.5625	47.65	0.00	0.0	112.5060	-82.53	6581.62	0.013
L6	38.92 - 0 (6)	TP74.5x62.453x0.5625	47.64	0.00	0.0	132.0060	-113.65	7722.36	0.015

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	225.79 - 197.75 (1)	TP28.6563x21.5x0.1875	229.00	596.72	0.384	0.00	596.72	0.000
L2	197.75 - 162.72 (2)	TP37.0938x27.24x0.375	985.04	2275.65	0.433	0.00	2275.65	0.000
L3	162.72 - 120.09 (3)	TP47.1563x35.0487x0.4375	2245.69	4220.43	0.532	0.00	4220.43	0.000
L4	120.09 - 78.99 (4)	TP56.6563x44.6617x0.5	3612.66	6884.04	0.525	0.00	6884.04	0.000
L5	78.99 - 38.92 (5)	TP65.7813x53.7418x0.5625	5089.73	10359.42	0.491	0.00	10359.42	0.000
L6	38.92 - 0 (6)	TP74.5x62.453x0.5625	7060.63	13554.17	0.521	0.00	13554.17	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	225.79 - 197.75 (1)	TP28.6563x21.5x0.1875	14.32	286.46	0.050	1.46	688.08	0.002
L2	197.75 - 162.72 (2)	TP37.0938x27.24x0.375	28.58	739.96	0.039	2.11	2295.53	0.001
L3	162.72 - 120.09 (3)	TP47.1563x35.0487x0.4375	32.31	1099.08	0.029	2.11	4340.89	0.000
L4	120.09 - 78.99 (4)	TP56.6563x44.6617x0.5	36.07	1510.73	0.024	2.10	7176.32	0.000
L5	78.99 - 38.92 (5)	TP65.7813x53.7418x0.5625	39.60	1974.49	0.020	1.83	10896.33	0.000
L6	38.92 - 0 (6)	TP74.5x62.453x0.5625	42.93	2316.71	0.019	1.83	15000.83	0.000

Pole Interaction Design Data

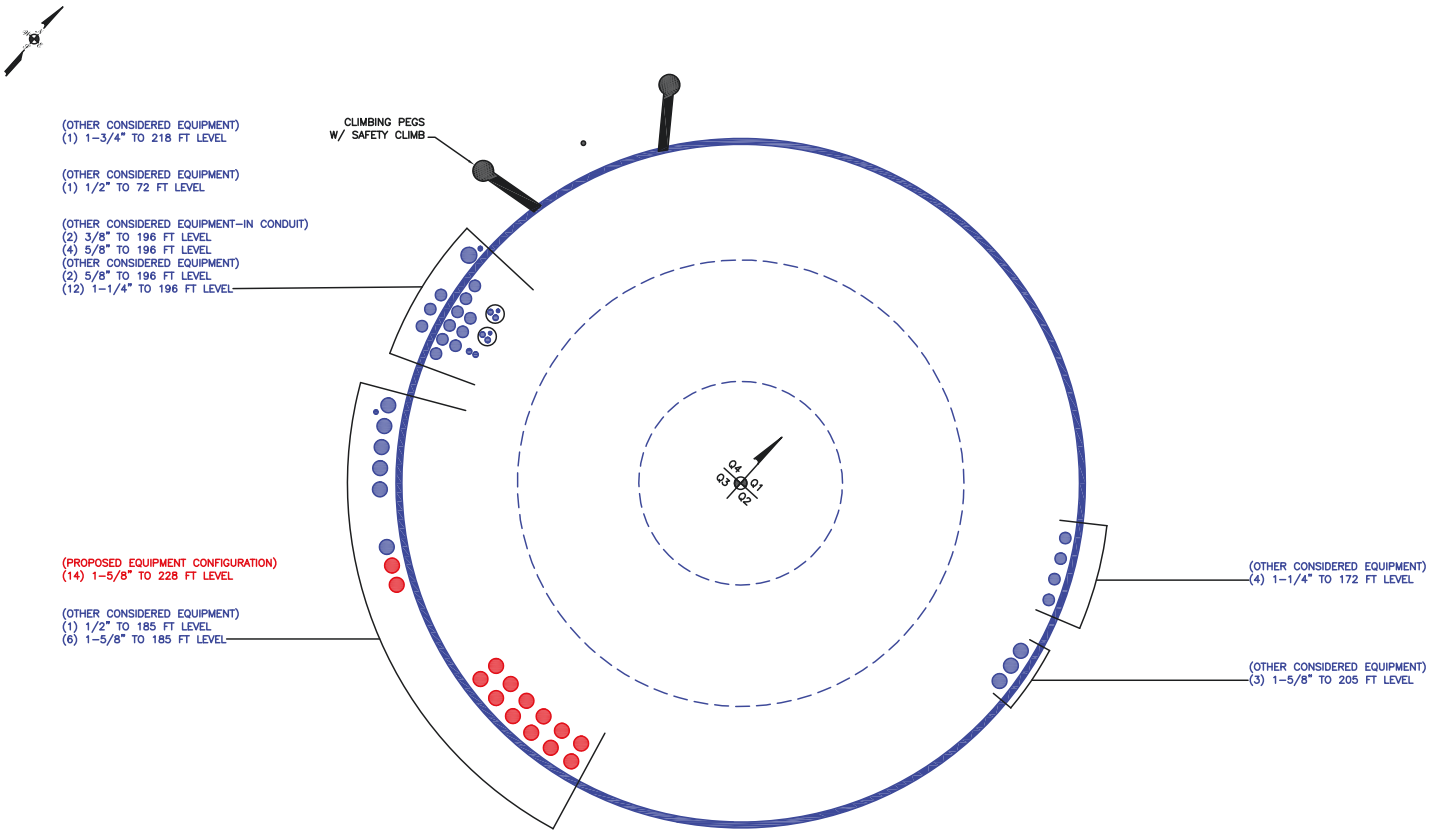
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	225.79 - 197.75 (1)	0.013	0.384	0.000	0.050	0.002	0.399	1.050	4.8.2
L2	197.75 - 162.72 (2)	0.012	0.433	0.000	0.039	0.001	0.446	1.050	4.8.2
L3	162.72 - 120.09 (3)	0.012	0.532	0.000	0.029	0.000	0.545	1.050	4.8.2
L4	120.09 - 78.99 (4)	0.012	0.525	0.000	0.024	0.000	0.537	1.050	4.8.2
L5	78.99 - 38.92 (5)	0.013	0.491	0.000	0.020	0.000	0.504	1.050	4.8.2
L6	38.92 - 0 (6)	0.015	0.521	0.000	0.019	0.000	0.536	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	225.79 - 197.75	Pole	TP28.6563x21.5x0.1875	1	-12.03	1002.63	38.0	Pass
L2	197.75 - 162.72	Pole	TP37.0938x27.24x0.375	2	-29.40	2589.87	42.5	Pass
L3	162.72 - 120.09	Pole	TP47.1563x35.0487x0.4375	3	-43.15	3846.79	51.9	Pass
L4	120.09 - 78.99	Pole	TP56.6563x44.6617x0.5	4	-60.52	5287.57	51.2	Pass
L5	78.99 - 38.92	Pole	TP65.7813x53.7418x0.5625	5	-82.53	6910.70	48.0	Pass
L6	38.92 - 0	Pole	TP74.5x62.453x0.5625	6	-113.65	8108.48	51.0	Pass
							Summary	
						Pole (L3)	51.9	Pass
						RATING =	**51.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806358 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

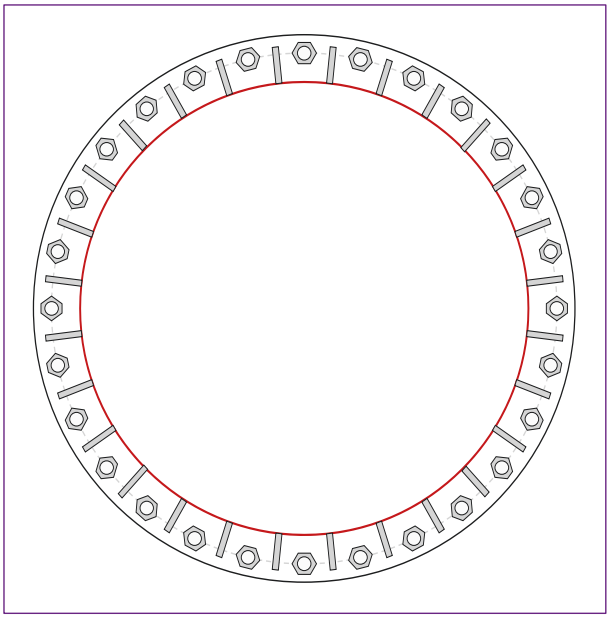
Monopole Base Plate Connection

Site Info	
BU #	806358
Site Name	NHV 109 943107
Order #	658817 Rev. 0

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

Applied Loads	
Moment (kip-ft)	7060.63
Axial Force (kips)	113.65
Shear Force (kips)	42.93

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(28) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 84" BC

Base Plate Data

90" OD x 2.5" Plate (A871-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(28) 18"H x 6"W x 1"T, Notch: 1"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" groove, 45° dbl bevel, 0.5" fillet
vert. weld: 0.5" fillet

Pole Data

74.5" x 0.5625" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 139.99	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.53	ϕVn = 149.1	**54.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	19.46	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**34.3%**	**Pass**

Stiffener Summary		
Horizontal Weld:	**38.5%**	**Pass**
Vertical Weld:	**24.5%**	**Pass**
Plate Flexure+Shear:	**8.5%**	**Pass**
Plate Tension+Shear:	**38.7%**	**Pass**
Plate Compression:	**38.1%**	**Pass**
Pole Summary		
Punching Shear:	**6.0%**	**Pass**

Job No.	CN12-647R1
Project No.	2300001
BU#:	806358
Site Name:	NHV 109 943107
App#:	658817 Rev. 0
Date:	10/20/2023

MORRISON HERSHFIELD

Foundation Reaction Comparison - Rev. H					
Reactions	**Original Design Reactions**	**Modified Design Reactions1**	**Current Analysis Reactions**	**% Capacity***	**Pass / Fail**
MOMENT (kip-ft)	8439.1	11392.8	7060.6	59.0%	***Pass***
SHEAR (kips)	50.8	68.6	42.9	59.6%	***Pass***

**TIA-222-H Section 15.5 Applied.*

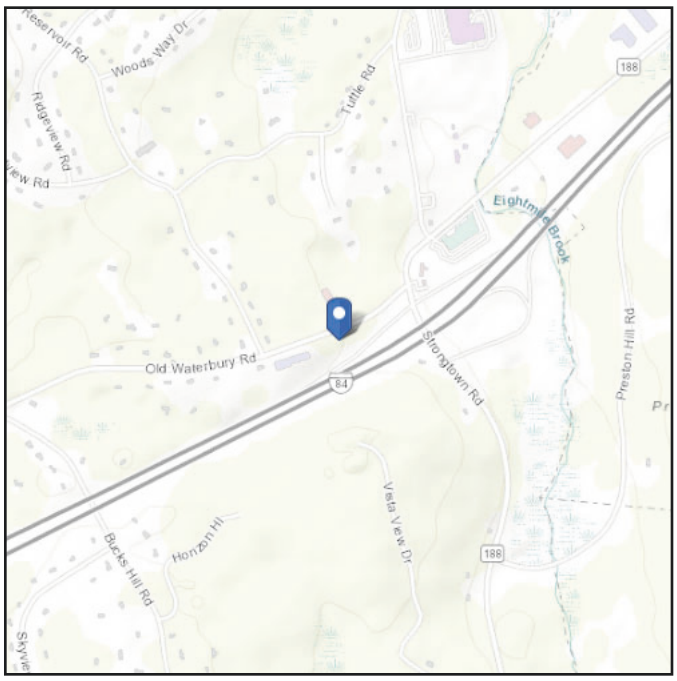
Although the shear capacity is at 60.6%, the moment reaction is the governing criteria for a monopole drilled pier foundation. Therefore, the overall capacity for this foundation is 59%.

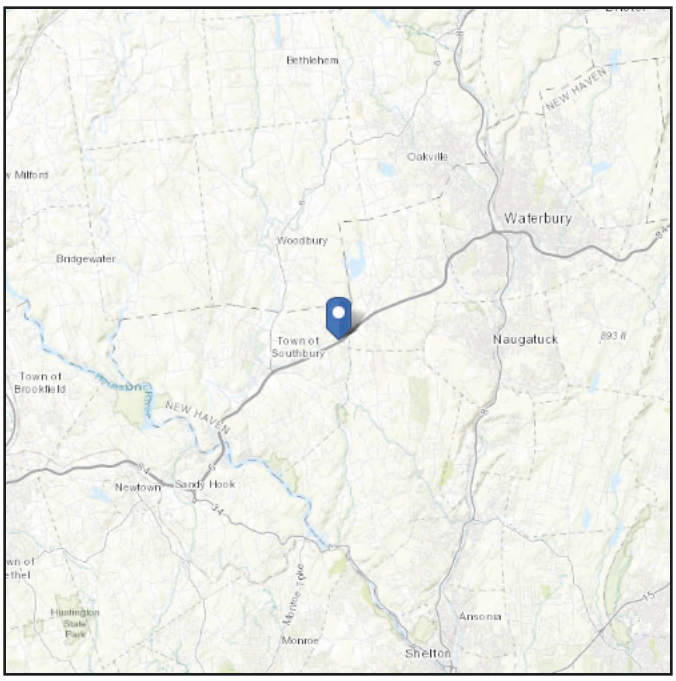
Design reactions were taken from the tower drawings by EEI, CCIsites document # 821496

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.493589
Risk Category:	II	**Longitude:**	-73.165272
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	665.9111476346153 ft (NAVD 88)





Wind

Results:

Wind Speed	116 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Fri Oct 20 2023

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

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

Seismic

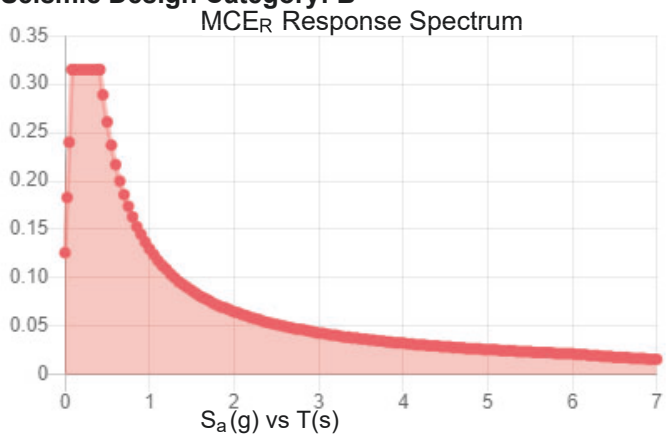
D - Default (see Section 11.4.3)

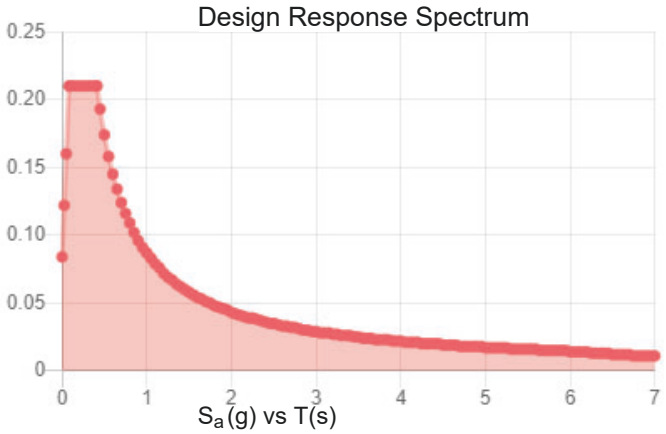
Site Soil Class:

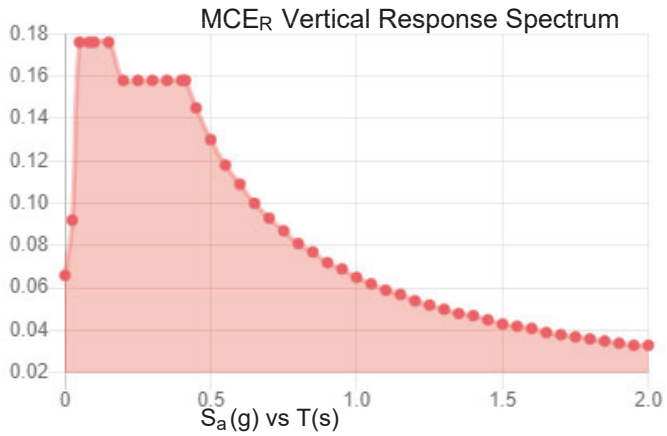
Results:

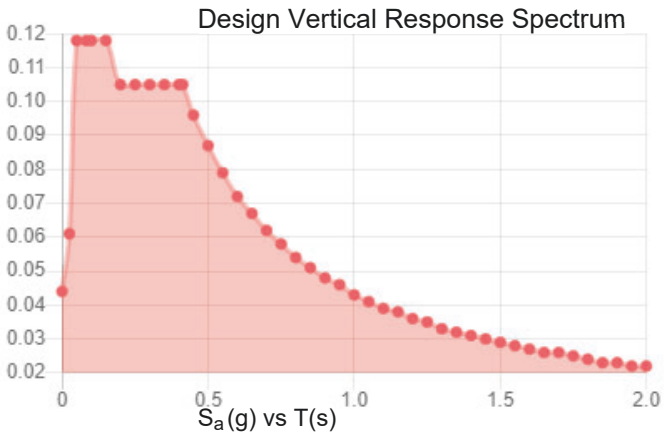
S_S :	0.197	S_{D1} :	0.087
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.109
F_v :	2.4	PGA_M :	0.173
S_{MS} :	0.315	F_{PGA} :	1.581
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.21	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri Oct 20 2023**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri Oct 20 2023

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

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