



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

September 22, 2022

Ersilia Davis
Crown Castle
1777 Sentry Parkway W
VEVA 17, Suite 4000
Blue Bell, PA 19422
edavis@nbcllc.com

RE: EM-AT&T-167-220728 – AT&T notice of intent to modify an existing telecommunications facility located at 50 Woodfield Road, Woodbridge, Connecticut.

Dear Ersilia Davis:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 20, 2022 submitted in response to the Council's August 24, 2022 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/RDM/emr

From: Ersilia Davis <edavis@nbcllc.com>
Sent: Friday, September 16, 2022 10:18 AM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>; Walsh, Christina <Christina.Walsh@ct.gov>
Subject: RE: Council Incomplete Letter for EM-AT&T-167-220728 (50 Woodfield Road, Woodbridge)

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Good morning,

As per requested in the attached incomplete letter, attached is an updated Structural Analysis Report for the facility. The report includes AT&T proposed equipment and Verizon's proposed equipment in addition to other entities located at the facility.

I will also be sending a copy of the report via Fedex.

This exempt modification request should now be considered complete.

Thank you

Ersilia Davis
Project Manager

NETWORK BUILDING + CONSULTING

1777 Sentry Parkway W | VEVA 17, Suite 400 | Blue Bell, PA | 19422
M 551-804-0667



Date: **August 31, 2022**



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

Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Site Number: CTL05163
Site Name: WOODBRIDGE COUNTRY CLUB
FA Number: 10071344

Crown Castle Designation: **BU Number:** 842879
Site Name: WOODBRIDGE COUNTRY CLUB
JDE Job Number: 686241
Work Order Number: 2155569
Order Number: 586276 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 2155569

Site Data: **50 WOODFIELD ROAD, WOODBRIDGE, NEW HAVEN County, CT**
Latitude 41° 19' 39.5", Longitude -72° 59' 36.84"
102 Foot - Monopole Tower

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

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

LC7: Proposed Equipment Configuration

Sufficient Capacity-31.3%

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Kibreab Gebremariam

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer



Terry P Styran
2022.09.01
14:00:30 -04'00'

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1) INTRODUCTION

This tower is a 102 ft Monopole tower designed by EEI.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
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)		
98.0	102.0	3	ericsson	RRUS 4449 B5/B12	2	3/8		
		3	ericsson	RRUS 4478 B14_CCIV2				
		3	ericsson	RRUS 8843 B2/B66A_CCIV2				
		1	raycap	DC6-48-60-18-8F				
		1	raycap	DC9-48-60-24-8C-EV				
	101.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe			2	13/16
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe			3	7/8
		3	ericsson	AIR 6419 B77G_CCIV3 w/ Mount Pipe			6	1-5/8
	98.0	1	Sabre	13' Sector Mount [#C10-857-802]				
	97.0	3	ericsson	AIR 6449 B77D w/ Mount Pipe				

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
90.0	90.0	3	antel	BXA-70063/6CF w/ Mount Pipe	19	1-5/8
		6	jma wireless	MX06FRO660-03 w/ Mount Pipe		
		1	raycap	RVZDC-6627-PF-48		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
		6	samsung telecommunications	RFV01U-D2A		
		1	tower mounts	Platform Mount [LP 303-1]		
67.0	67.0	3	fujitsu	TA08025-B604	1	1-3/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4529495	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	7160639	CCISITES
4-TOWER MANUFACTURER DRAWINGS	7160648	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	102 - 86.58	Pole	TP34.3925x29.58x0.3125	1	-5.67	1984.45	3.4	Pass
L2	86.58 - 42.7433	Pole	TP47.4475x32.2591x0.375	2	-22.73	3293.22	18.7	Pass
L3	42.7433 - 0	Pole	TP60x44.669x0.375	3	-38.65	4359.25	30.3	Pass
							Summary	
						Pole (L3)	30.3	Pass
						Rating =	30.3	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	25.3	Pass
1	Base Plate	0	31.3	Pass
1	Base Foundation (Structure)	0	30.1	Pass
1	Base Foundation (Soil Interaction)	0	31.2	Pass

Structure Rating (max from all components) =	31.3%
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Notes:

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

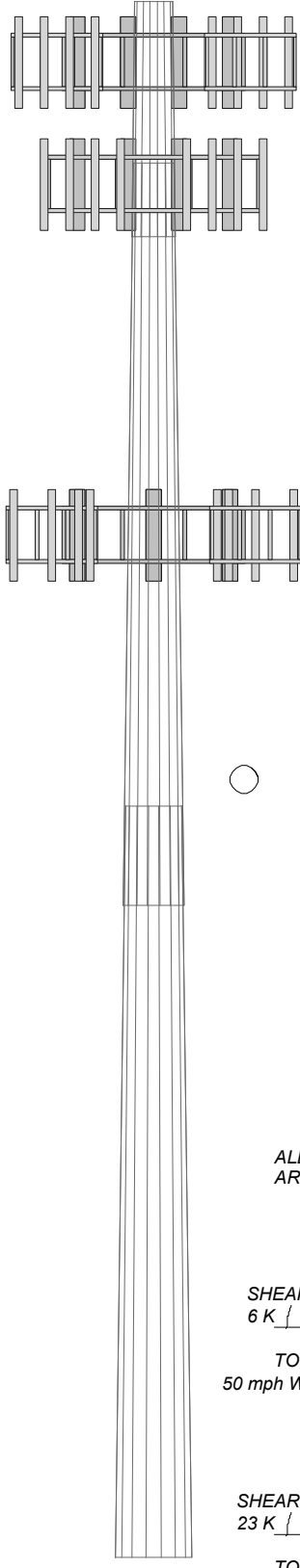
4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	15.42	48.67	49.24
Number of Sides	18	18	18
Thickness (in)	0.3125	0.3750	0.3750
Socket Length (ft)	4.83	6.50	
Top Dia (in)	29.5800	32.2591	44.6690
Bot Dia (in)	34.3925	47.4475	60.0000
Grade		A572-65	
Weight (K)	1.6	7.8	10.4

102.0 ft
86.6 ft
42.7 ft
0.0 ft



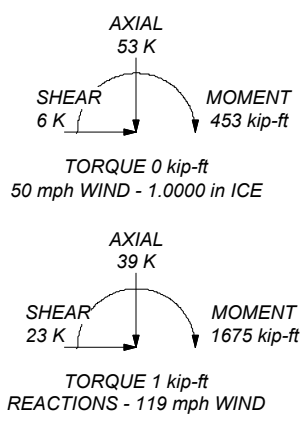
MATERIAL STRENGTH

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 C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.000 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: 30.3%

ALL REACTIONS ARE FACTORED



Crown Castle
 2000 Corporate Drive
 Canonsburg, PA 15317
 Phone: (724) 416-2000
 FAX: The pathway to Possible

Job:			
Project:	842879		
Client:	Crown Castle	Drawn by:	KGebremariam
Code:	TIA-222-H	Date:	08/31/22
Path:			Scale: NTS
			Dwg No. E-1

C:\Users\KGebremariam\OneDrive - Crown Castle USA, Inc\Documents\Work Area\842879\W02_2155569 - SA\Prod\842879.dwg

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: 360.00 ft.
- Basic wind speed of 119 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 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 Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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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	102.00-86.58	15.42	4.83	18	29.5800	34.3925	0.3125	1.2500	A572-65 (65 ksi)
L2	86.58-42.74	48.67	6.50	18	32.2591	47.4475	0.3750	1.5000	A572-65 (65 ksi)
L3	42.74-0.00	49.24		18	44.6690	60.0000	0.3750	1.5000	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	29.9881	29.0297	3141.6028	10.3900	15.0266	209.0689	6287.3394	14.5176	4.6561	14.899
	34.8749	33.8031	4960.1311	12.0984	17.4714	283.9002	9926.7888	16.9048	5.5031	17.61
L2	34.2304	37.9500	4874.1199	11.3188	16.3876	297.4273	9754.6533	18.9786	5.0176	13.38
	48.1216	56.0280	15684.743 9	16.7107	24.1033	650.7293	31390.126 2	28.0193	7.6908	20.509
L3	47.3552	52.7210	13068.076 5	15.7244	22.6919	575.8923	26153.348 3	26.3655	7.2018	19.205
	60.8677	70.9687	31875.779 7	21.1669	30.4800	1045.7933	63793.502 3	35.4911	9.9000	26.4

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 102.00- 86.58				1	1	1			
L2 86.58- 42.74				1	1	1			
L3 42.74-0.00				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 r in	Perimeter r in	Weight plf
***** Safety Line 5/8"	C	No	Surface Ar (CaAa)	102.00 - 0.00	1	1	0.000 0.000	0.8800		0.40
Climbing Rungs	C	No	Surface Ar (CaAa)	102.00 - 0.00	1	1	-0.050 0.050	0.7050		1.80
***** CU12PSM9P8XXX(1- 3/8) *****	A	No	Surface Ar (CaAa)	67.00 - 0.00	1	1	0.500 0.500	1.4110		1.66

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf	
***** LDF7-50A(1-5/8)	A	No	No	Inside Pole	98.00 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.82 0.82

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	98.00 - 0.00	1	1" Ice	0.00	0.82
							No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
FB-L98B-235-XXX(3/8)	A	No	No	Inside Pole	98.00 - 0.00	1	1" Ice	0.00	0.06
							No Ice	0.00	0.06
							1/2" Ice	0.00	0.06

PWRT-606-S(7/8)	A	No	No	Inside Pole	98.00 - 0.00	3	No Ice	0.00	0.89
							1/2" Ice	0.00	0.89
							1" Ice	0.00	0.89
PWRT-608-S(13/16)	A	No	No	Inside Pole	98.00 - 0.00	2	No Ice	0.00	0.62
							1/2" Ice	0.00	0.62
							1" Ice	0.00	0.62

LDF7-50A(1-5/8)	C	No	No	Inside Pole	90.00 - 0.00	18	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82

HB158-U12S24-XXX-LI(1-5/8)	C	No	No	Inside Pole	90.00 - 0.00	1	No Ice	0.00	3.20
							1/2" Ice	0.00	3.20
							1" Ice	0.00	3.20

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	102.00-86.58	A	0.000	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.444	0.000	0.10
L2	86.58-42.74	A	0.000	0.000	3.423	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	6.948	0.000	0.88
L3	42.74-0.00	A	0.000	0.000	6.031	0.000	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	6.775	0.000	0.86

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	102.00-86.58	A	0.944	0.000	0.000	0.000	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	8.266	0.000	0.16
L2	86.58-42.74	A	0.908	0.000	0.000	8.002	0.000	0.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	23.499	0.000	1.06
L3	42.74-0.00	A	0.814	0.000	0.000	13.793	0.000	0.56
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	22.298	0.000	1.02

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	102.00-86.58	0.0000	1.2191	0.0000	2.2143
L2	86.58-42.74	0.0000	0.5552	0.0000	1.3917
L3	42.74-0.00	0.0000	0.1192	0.0000	0.8238

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 5/8"	86.58 - 102.00	1.0000	1.0000
L1	3	Climbing Rungs	86.58 - 102.00	1.0000	1.0000
L2	2	Safety Line 5/8"	42.74 - 86.58	1.0000	1.0000
L2	3	Climbing Rungs	42.74 - 86.58	1.0000	1.0000
L2	24	CU12PSM9P8XXX(1-3/8)	42.74 - 67.00	1.0000	1.0000
L3	2	Safety Line 5/8"	0.00 - 42.74	1.0000	1.0000
L3	3	Climbing Rungs	0.00 - 42.74	1.0000	1.0000
L3	24	CU12PSM9P8XXX(1-3/8)	0.00 - 42.74	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
***** Lighting Rod 5/8" x 4' on 4' Pole	C	From Leg	0.00 0.00 4.00	0.0000	102.00
**** DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	98.00
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	98.00
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	98.00
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	98.00
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	98.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement
			Horz	Lateral		
			ft	ft	°	ft
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	98.00
			0.00	3.00		
RRUS 4449 B5/B12	A	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 4449 B5/B12	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 4449 B5/B12	C	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 4478 B14_CCIV2	A	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 4478 B14_CCIV2	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
RRUS 4478 B14_CCIV2	C	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
DC6-48-60-18-8F	A	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		
DC9-48-60-24-8C-EV	A	From Leg	4.00	0.00	0.0000	98.00
			4.00	4.00		

AIR 6419 B77G_CCIV3 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	98.00
			0.00	3.00		
AIR 6419 B77G_CCIV3 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	3.00		
AIR 6419 B77G_CCIV3 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	98.00
			0.00	3.00		
AIR 6449 B77D w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	98.00
			0.00	-1.00		
AIR 6449 B77D w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	-1.00		
AIR 6449 B77D w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	98.00
			0.00	-1.00		
6' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.0000	98.00
			0.00	0.00		
6' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.0000	98.00
			4.00	0.00		
6' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.0000	98.00
			4.00	0.00		
13' Sector Mount [#C10-857-802]	C	None			0.0000	98.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft

BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	90.00
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	90.00
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	90.00
Platform Mount [LP 303-1] ***	C	None		0.0000	90.00
(2) MX06FRO660-03 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	90.00
(2) MX06FRO660-03 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	90.00
(2) MX06FRO660-03 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	90.00
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	90.00
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	90.00
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	90.00
(2) RFV01U-D2A	A	From Leg	4.00 0.00 0.00	0.0000	90.00
(2) RFV01U-D2A	B	From Leg	4.00 0.00 0.00	0.0000	90.00
(2) RFV01U-D2A	C	From Leg	4.00 0.00 0.00	0.0000	90.00
RFV01U-D1A	A	From Leg	4.00 0.00 0.00	0.0000	90.00
RFV01U-D1A	B	From Leg	4.00 0.00 0.00	0.0000	90.00
RFV01U-D1A	C	From Leg	4.00 0.00 0.00	0.0000	90.00
RVZDC-6627-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	90.00
Mount Reinforcement Specifications ***** ***	C	None		0.0000	90.00
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	67.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	67.00
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	67.00
TA08025-B604	A	From Leg	4.00 0.00	0.0000	67.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
TA08025-B604	B	From Leg	0.00 4.00 0.00 0.00	0.0000	67.00
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	67.00
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	67.00
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	67.00
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	67.00
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	67.00
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	67.00
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	67.00
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	67.00
Commscope MC-PK8-DSH ***** ****	C	None	0.00	0.0000	67.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
*** ****								

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	102 - 86.58	Pole	Max Tension	27	0.00	-0.00	-0.00
			Max. Compression	26	-9.74	0.06	0.39
			Max. Mx	20	-5.67	50.40	0.22
			Max. My	2	-5.67	0.09	50.54
			Max. Vy	20	-6.21	50.40	0.22
			Max. Vx	2	-6.21	0.09	50.54
			Max. Torque	9			0.48
L2	86.58 - 42.7433	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.86	0.29	1.04
			Max. Mx	20	-22.73	648.62	0.41
			Max. My	2	-22.73	0.16	651.35
			Max. Vy	20	-18.13	648.62	0.41
			Max. Vx	2	-18.21	0.16	651.35
			Max. Torque	9			1.11
L3	42.7433 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.85	0.70	0.59
			Max. Mx	20	-38.65	1668.34	0.23
			Max. My	2	-38.65	0.34	1674.61
			Max. Vy	20	-23.18	1668.34	0.23
			Max. Vx	2	-23.26	0.34	1674.61
			Max. Torque	9			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	9			1.11

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	52.85	0.00	0.00
	Max. H _x	20	38.65	23.17	0.00
	Max. H _z	2	38.65	0.00	23.25
	Max. M _x	2	1674.61	0.00	23.25
	Max. M _z	8	1667.66	-23.17	0.00
	Max. Torsion	9	1.11	-23.17	0.00
	Min. Vert	11	28.99	-20.07	-11.62
	Min. H _x	8	38.65	-23.17	0.00
	Min. H _z	14	38.65	0.00	-23.25
	Min. M _x	14	-1674.15	0.00	-23.25
	Min. M _z	20	-1668.34	23.17	0.00
	Min. Torsion	21	-1.11	23.17	0.00

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	32.21	0.00	0.00	-0.19	0.28	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	38.65	0.00	-23.25	-1674.61	0.34	-0.07
0.9 Dead+1.0 Wind 0 deg - No Ice	28.99	0.00	-23.25	-1669.41	0.25	-0.07
1.2 Dead+1.0 Wind 30 deg - No Ice	38.65	11.58	-20.13	-1450.29	-833.66	-0.61
0.9 Dead+1.0 Wind 30 deg - No Ice	28.99	11.58	-20.13	-1445.78	-831.18	-0.61
1.2 Dead+1.0 Wind 60 deg - No Ice	38.65	20.07	-11.62	-837.42	-1444.19	-0.99
0.9 Dead+1.0 Wind 60 deg - No Ice	28.99	20.07	-11.62	-834.79	-1439.84	-0.99
1.2 Dead+1.0 Wind 90 deg - No Ice	38.65	23.17	0.00	-0.23	-1667.66	-1.10
0.9 Dead+1.0 Wind 90 deg - No Ice	28.99	23.17	0.00	-0.17	-1662.62	-1.11
1.2 Dead+1.0 Wind 120 deg - No Ice	38.65	20.07	11.62	836.96	-1444.19	-0.92
0.9 Dead+1.0 Wind 120 deg - No Ice	28.99	20.07	11.62	834.44	-1439.84	-0.92
1.2 Dead+1.0 Wind 150 deg - No Ice	38.65	11.58	20.13	1449.82	-833.66	-0.49
0.9 Dead+1.0 Wind 150 deg - No Ice	28.99	11.58	20.13	1445.43	-831.18	-0.49
1.2 Dead+1.0 Wind 180 deg - No Ice	38.65	0.00	23.25	1674.15	0.34	0.07
0.9 Dead+1.0 Wind 180 deg - No Ice	28.99	0.00	23.25	1669.06	0.25	0.07
1.2 Dead+1.0 Wind 210 deg - No Ice	38.65	-11.58	20.13	1449.82	834.34	0.61
0.9 Dead+1.0 Wind 210 deg - No Ice	28.99	-11.58	20.13	1445.43	831.69	0.61
1.2 Dead+1.0 Wind 240 deg - No Ice	38.65	-20.07	11.62	836.96	1444.87	0.99
0.9 Dead+1.0 Wind 240 deg - No Ice	28.99	-20.07	11.62	834.44	1440.35	0.99

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
- No Ice						
1.2 Dead+1.0 Wind 270 deg	38.65	-23.17	0.00	-0.23	1668.34	1.10
- No Ice						
0.9 Dead+1.0 Wind 270 deg	28.99	-23.17	0.00	-0.17	1663.13	1.11
- No Ice						
1.2 Dead+1.0 Wind 300 deg	38.65	-20.07	-11.62	-837.42	1444.87	0.92
- No Ice						
0.9 Dead+1.0 Wind 300 deg	28.99	-20.07	-11.62	-834.79	1440.35	0.92
- No Ice						
1.2 Dead+1.0 Wind 330 deg	38.65	-11.58	-20.13	-1450.29	834.34	0.49
- No Ice						
0.9 Dead+1.0 Wind 330 deg	28.99	-11.58	-20.13	-1445.78	831.69	0.49
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	52.85	0.00	0.00	-0.59	0.70	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	52.85	0.00	-6.46	-453.03	0.72	-0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	52.85	3.22	-5.60	-392.41	-224.89	-0.15
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	52.85	5.59	-3.23	-226.82	-390.04	-0.24
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	52.85	6.45	-0.00	-0.62	-450.49	-0.27
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	52.85	5.59	3.23	225.59	-390.04	-0.22
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	52.85	3.22	5.60	391.18	-224.89	-0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	52.85	0.00	6.46	451.79	0.72	0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	52.85	-3.22	5.60	391.18	226.32	0.15
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	52.85	-5.59	3.23	225.59	391.48	0.24
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	52.85	-6.45	-0.00	-0.62	451.93	0.27
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	52.85	-5.59	-3.23	-226.82	391.48	0.22
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	52.85	-3.22	-5.60	-392.41	226.32	0.11
Dead+Wind 0 deg - Service	32.21	0.00	-5.57	-400.69	0.28	-0.02
Dead+Wind 30 deg - Service	32.21	2.78	-4.82	-347.04	-199.20	-0.15
Dead+Wind 60 deg - Service	32.21	4.81	-2.79	-200.44	-345.24	-0.25
Dead+Wind 90 deg - Service	32.21	5.55	0.00	-0.19	-398.69	-0.28
Dead+Wind 120 deg - Service	32.21	4.81	2.79	200.05	-345.24	-0.23
Dead+Wind 150 deg - Service	32.21	2.78	4.82	346.65	-199.20	-0.12
Dead+Wind 180 deg - Service	32.21	0.00	5.57	400.30	0.28	0.02
Dead+Wind 210 deg - Service	32.21	-2.78	4.82	346.65	199.77	0.15
Dead+Wind 240 deg - Service	32.21	-4.81	2.79	200.05	345.80	0.25
Dead+Wind 270 deg - Service	32.21	-5.55	0.00	-0.19	399.26	0.28
Dead+Wind 300 deg - Service	32.21	-4.81	-2.79	-200.44	345.80	0.23
Dead+Wind 330 deg - Service	32.21	-2.78	-4.82	-347.04	199.77	0.12

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-32.21	0.00	0.00	32.21	0.00	0.000%
2	0.00	-38.65	-23.25	0.00	38.65	23.25	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
3	0.00	-28.99	-23.25	0.00	28.99	23.25	0.000%
4	11.58	-38.65	-20.13	-11.58	38.65	20.13	0.000%
5	11.58	-28.99	-20.13	-11.58	28.99	20.13	0.000%
6	20.07	-38.65	-11.62	-20.07	38.65	11.62	0.000%
7	20.07	-28.99	-11.62	-20.07	28.99	11.62	0.000%
8	23.17	-38.65	0.00	-23.17	38.65	0.00	0.000%
9	23.17	-28.99	0.00	-23.17	28.99	0.00	0.000%
10	20.07	-38.65	11.62	-20.07	38.65	-11.62	0.000%
11	20.07	-28.99	11.62	-20.07	28.99	-11.62	0.000%
12	11.58	-38.65	20.13	-11.58	38.65	-20.13	0.000%
13	11.58	-28.99	20.13	-11.58	28.99	-20.13	0.000%
14	0.00	-38.65	23.25	0.00	38.65	-23.25	0.000%
15	0.00	-28.99	23.25	0.00	28.99	-23.25	0.000%
16	-11.58	-38.65	20.13	11.58	38.65	-20.13	0.000%
17	-11.58	-28.99	20.13	11.58	28.99	-20.13	0.000%
18	-20.07	-38.65	11.62	20.07	38.65	-11.62	0.000%
19	-20.07	-28.99	11.62	20.07	28.99	-11.62	0.000%
20	-23.17	-38.65	0.00	23.17	38.65	0.00	0.000%
21	-23.17	-28.99	0.00	23.17	28.99	0.00	0.000%
22	-20.07	-38.65	-11.62	20.07	38.65	11.62	0.000%
23	-20.07	-28.99	-11.62	20.07	28.99	11.62	0.000%
24	-11.58	-38.65	-20.13	11.58	38.65	20.13	0.000%
25	-11.58	-28.99	-20.13	11.58	28.99	20.13	0.000%
26	0.00	-52.85	0.00	0.00	52.85	0.00	0.000%
27	0.00	-52.85	-6.46	0.00	52.85	6.46	0.000%
28	3.22	-52.85	-5.60	-3.22	52.85	5.60	0.000%
29	5.59	-52.85	-3.23	-5.59	52.85	3.23	0.000%
30	6.45	-52.85	0.00	-6.45	52.85	0.00	0.000%
31	5.59	-52.85	3.23	-5.59	52.85	-3.23	0.000%
32	3.22	-52.85	5.60	-3.22	52.85	-5.60	0.000%
33	0.00	-52.85	6.46	0.00	52.85	-6.46	0.000%
34	-3.22	-52.85	5.60	3.22	52.85	-5.60	0.000%
35	-5.59	-52.85	3.23	5.59	52.85	-3.23	0.000%
36	-6.45	-52.85	0.00	6.45	52.85	0.00	0.000%
37	-5.59	-52.85	-3.23	5.59	52.85	3.23	0.000%
38	-3.22	-52.85	-5.60	3.22	52.85	5.60	0.000%
39	0.00	-32.21	-5.57	0.00	32.21	5.57	0.000%
40	2.78	-32.21	-4.82	-2.78	32.21	4.82	0.000%
41	4.81	-32.21	-2.79	-4.81	32.21	2.79	0.000%
42	5.55	-32.21	0.00	-5.55	32.21	0.00	0.000%
43	4.81	-32.21	2.79	-4.81	32.21	-2.79	0.000%
44	2.78	-32.21	4.82	-2.78	32.21	-4.82	0.000%
45	0.00	-32.21	5.57	0.00	32.21	-5.57	0.000%
46	-2.78	-32.21	4.82	2.78	32.21	-4.82	0.000%
47	-4.81	-32.21	2.79	4.81	32.21	-2.79	0.000%
48	-5.55	-32.21	0.00	5.55	32.21	0.00	0.000%
49	-4.81	-32.21	-2.79	4.81	32.21	2.79	0.000%
50	-2.78	-32.21	-4.82	2.78	32.21	4.82	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000637
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00009612
5	Yes	4	0.00000001	0.00006285
6	Yes	4	0.00000001	0.00011821
7	Yes	4	0.00000001	0.00007781
8	Yes	4	0.00000001	0.00002996
9	Yes	4	0.00000001	0.00001986
10	Yes	4	0.00000001	0.00009352
11	Yes	4	0.00000001	0.00006117
12	Yes	4	0.00000001	0.00010971

13	Yes	4	0.00000001	0.00007208
14	Yes	4	0.00000001	0.00000636
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00011207
17	Yes	4	0.00000001	0.00007365
18	Yes	4	0.00000001	0.00009306
19	Yes	4	0.00000001	0.00006085
20	Yes	4	0.00000001	0.00002997
21	Yes	4	0.00000001	0.00001987
22	Yes	4	0.00000001	0.00011693
23	Yes	4	0.00000001	0.00007693
24	Yes	4	0.00000001	0.00009766
25	Yes	4	0.00000001	0.00006385
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00013182
28	Yes	4	0.00000001	0.00013444
29	Yes	4	0.00000001	0.00013412
30	Yes	4	0.00000001	0.00013073
31	Yes	4	0.00000001	0.00013335
32	Yes	4	0.00000001	0.00013345
33	Yes	4	0.00000001	0.00013069
34	Yes	4	0.00000001	0.00013374
35	Yes	4	0.00000001	0.00013377
36	Yes	4	0.00000001	0.00013120
37	Yes	4	0.00000001	0.00013452
38	Yes	4	0.00000001	0.00013471
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102 - 86.58	3.453	39	0.2627	0.0007
L2	91.4133 - 42.7433	2.872	39	0.2592	0.0006
L3	49.2433 - 0	0.912	39	0.1657	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Lighting Rod 5/8" x 4' on 4' Pole	39	3.453	0.2627	0.0007	213920
98.00	DMP65R-BU6D w/ Mount Pipe	39	3.233	0.2620	0.0007	213920
90.00	BXA-70063/6CF w/ Mount Pipe	39	2.796	0.2581	0.0006	81759
67.00	MX08FRO665-21 w/ Mount Pipe	39	1.624	0.2171	0.0004	21227

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102 - 86.58	14.423	2	1.0964	0.0028
L2	91.4133 - 42.7433	12.000	2	1.0819	0.0025
L3	49.2433 - 0	3.813	2	0.6925	0.0009

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Lighting Rod 5/8" x 4' on 4' Pole	2	14.423	1.0964	0.0028	52354
98.00	DMP65R-BU6D w/ Mount Pipe	2	13.504	1.0935	0.0027	52354
90.00	BXA-70063/6CF w/ Mount Pipe	2	11.679	1.0774	0.0025	19898
67.00	MX08FRO665-21 w/ Mount Pipe	2	6.786	0.9068	0.0016	5092

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	102 - 86.58 (1)	TP34.3925x29.58x0.3125	15.42	0.00	0.0	32.306 9	-5.67	1889.95	0.003
L2	86.58 - 42.7433 (2)	TP47.4475x32.2591x0.37 5	48.67	0.00	0.0	53.613 7	-22.73	3136.40	0.007
L3	42.7433 - 0 (3)	TP60x44.669x0.375	49.24	0.00	0.0	70.968 7	-38.65	4151.67	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	102 - 86.58 (1)	TP34.3925x29.58x0.3125	50.55	1567.97	0.032	0.00	1567.97	0.000
L2	86.58 - 42.7433 (2)	TP47.4475x32.2591x0.37 5	651.35	3456.07	0.188	0.00	3456.07	0.000
L3	42.7433 - 0 (3)	TP60x44.669x0.375	1674.62	5436.67	0.308	0.00	5436.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u kip-ft	φT _n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	102 - 86.58 (1)	TP34.3925x29.58x0.3125	6.21	566.99	0.011	0.14	1617.30	0.000
L2	86.58 - 0	TP47.4475x32.2591x0.37	18.21	940.92	0.019	0.07	3711.68	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 $\frac{T_u}{\phi T_n}$
L3	42.7433 (2) 42.7433 - 0 (3)	5 TP60x44.669x0.375	23.26	1245.50	0.019	0.07	6503.57	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	102 - 86.58 (1)	0.003	0.032	0.000	0.011	0.000	0.035	1.050	4.8.2
L2	86.58 - 42.7433 (2)	0.007	0.188	0.000	0.019	0.000	0.196	1.050	4.8.2
L3	42.7433 - 0 (3)	0.009	0.308	0.000	0.019	0.000	0.318	1.050	4.8.2

Section Capacity Table

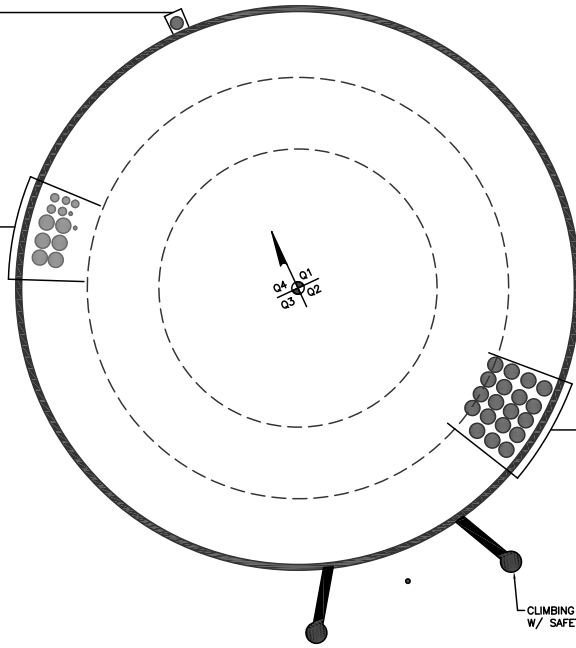
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	102 - 86.58	Pole	TP34.3925x29.58x0.3125	1	-5.67	1984.45	3.4	Pass
L2	86.58 - 42.7433	Pole	TP47.4475x32.2591x0.375	2	-22.73	3293.22	18.7	Pass
L3	42.7433 - 0	Pole	TP60x44.669x0.375	3	-38.65	4359.25	30.3	Pass
Summary								
Pole (L3)							30.3	Pass
RATING =							30.3	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(1) 1-3/8" TO 67 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(2) 3/8" TO 98 FT LEVEL
(3) 13/16" TO 98 FT LEVEL
(4) 7/8" TO 98 FT LEVEL
(5) 1-5/8" TO 98 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(19) 1-5/8" TO 90 FT LEVEL

CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

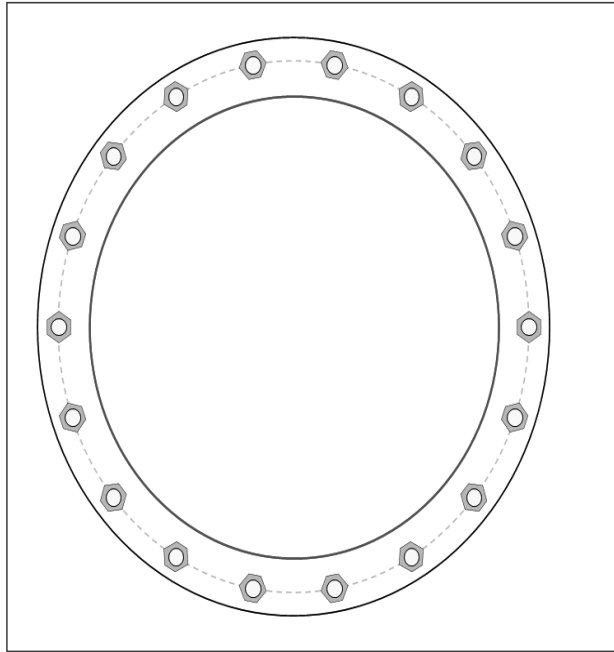


Site Info	
BU #	842879
Site Name	ODBRIDGE COUNTRY C
Order #	586276, Rev 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.5

Applied Loads	
Moment (kip-ft)	1674.61
Axial Force (kips)	38.65
Shear Force (kips)	23.26

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(18) 2-1/4" ϕ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 69" BC
Base Plate Data
75" OD x 2" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)
Stiffener Data
N/A
Pole Data
60" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
Pu_c = 66.84	$\phi Pn_c = 268.39$	Stress Rating
Vu = 1.29	$\phi Vn = 120.77$	25.3%
Mu = 2.1	$\phi Mn = 128.14$	Pass
Base Plate Summary		
Max Stress (ksi):	17.76	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	31.3%	Pass

Pier and Pad Foundation



BU #: 842879
 Site Name: WOODBRIDGE CO
 App. Number: 586276, Rev 0

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	39	kips
Base Shear, Vu_{comp} :	23	kips
Moment, M_u :	1675	ft-kips
Tower Height, H :	102	ft
BP Dist. Above Fdn, bp_{dist} :	4.75	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	179.04	23.00	12.2%	Pass
<i>Bearing Pressure (ksf)</i>	6.00	1.62	25.7%	Pass
<i>Overturning (kip*ft)</i>	5847.06	1822.10	31.2%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	5522.60	1744.00	30.1%	Pass
<i>Pier Compression (kip)</i>	35802.00	69.38	0.2%	Pass
<i>Pad Flexure (kip*ft)</i>	3934.05	646.73	15.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	986.16	92.65	8.9%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.017	8.7%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3898.96	1046.40	25.6%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	7.5	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, S_c :	8	
Pier Rebar Quantity, mc :	40	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	5	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	30.1%
Soil Rating*:	31.2%

Pad Properties		
Depth, D :	5	ft
Pad Width, W_1 :	27.5	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Top dir.2), Sp_{top2} :	8	
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	24	
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	36	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	110	pcf
Ultimate Gross Bearing, Q_{ult} :	8.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :	60	
Base Friction, μ :		
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, gw :	n/a	ft

--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 360.98 ft (NAVD 88)
Latitude: 41.327639
Longitude: -72.993567



Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

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

Date Accessed: Wed Aug 31 2022

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

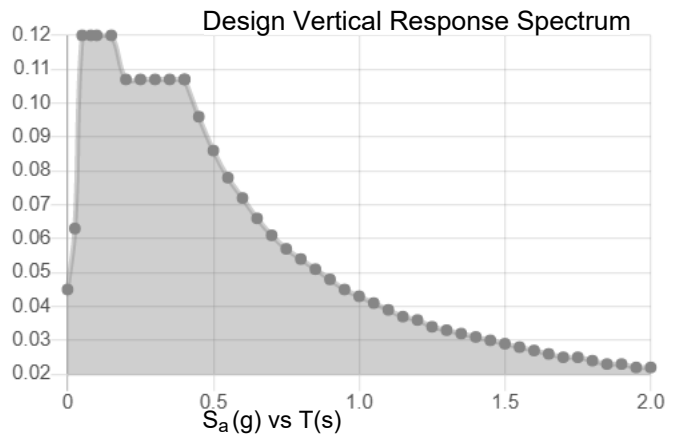
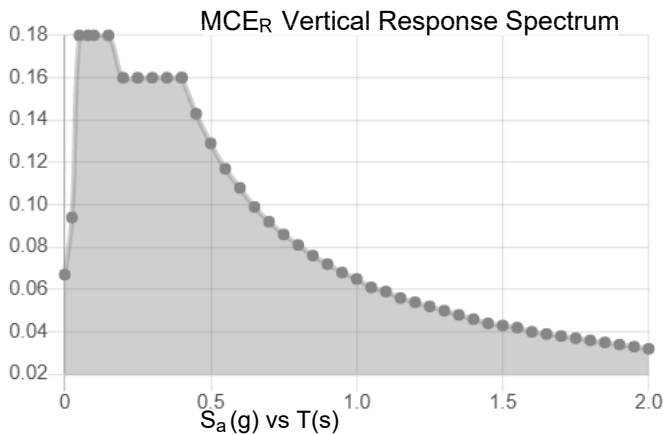
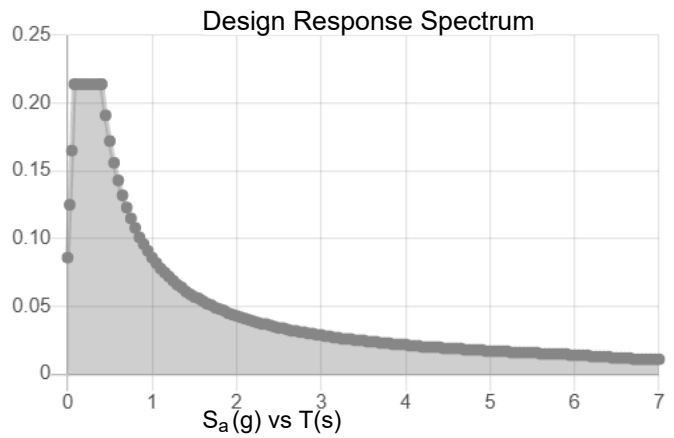
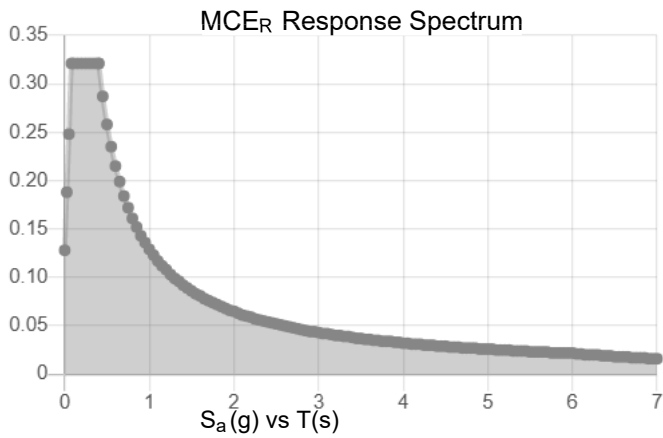
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.2	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA _M :	0.177
S_{MS} :	0.321	F_{PGA} :	1.576
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category B



Data Accessed: Wed Aug 31 2022

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

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

Date Accessed: Wed Aug 31 2022

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

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

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