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

July 26, 2023

Jeffrey Barbadora
Site Acquisition Specialist
Crown Castle
1800 W. Park Drive, Suite 250
Westborough, MA 01581
Jeff.Barbadora@crowncastle.com

RE: **TS-T-MOBILE-163-230613** – T-Mobile request for an order to approve tower sharing at an existing telecommunications facility located at 10 North Ridge Drive, Windham, Connecticut.

Dear Jeffrey Barbadora:

The Connecticut Siting Council (Council) is in receipt of your correspondence of July 21, 2023, submitted in response to the Council's July 5, 2023 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

The submission renders the request for tower sharing 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/ANM/dll

From: Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>
Sent: Friday, July 21, 2023 3:22 PM
To: LaFountain, Dakota <Dakota.LaFountain@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter: TS-T-MOBILE-163-230613 – 10 North Ridge Drive, Windham

Good afternoon,

Please see attached revised SA and EME.

One hard copy of each along with this email will be sent to your office.

Thanks,

Jeffrey Barbadora
Site Acquisition Specialist
781-970-0053

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

Date: **July 12, 2023**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Site Number:**	 CTNL200A
Crown Castle Designation:	**BU Number:** **Site Name:** **JDE Job Number:** **Work Order Number:** **Order Number:**	842423 WINDHAM NORTH RIDGE ROAD 671709 2244234 573238 Rev. 7
Engineering Firm Designation:	**Crown Castle Project Number:**	2244234
Site Data:	**10 NORTH RIDGE DRIVE, WINDHAM, WINDHAM County, CT** **Latitude *41° 44' 23.53"*, Longitude *-72° 10' 22.47"*** **88.7 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 – 78.3%**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Kenneth Sukitch

Respectfully submitted by:

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

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

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 88.7 ft Monopole tower designed by Engineered Endeavors Incorporated.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 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)
64.0	64.0	1	sitepro 1	RMQP-496-HK	3	1-5/8
		3	commscope	VV-65A-R1_TMO w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
84.0	84.0	3	cci antennas	DMP65R-BU8D w/ Mount Pipe	12 3 6	1-5/8 3/8 7/8
		3	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe		
		3	cci antennas	OPA65R-BU8D w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		3	ericsson	RRUS E2 B29		
		3	ericsson	RRUS-32 B30		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	raycap	DC6-48-60-18-8C-EV		
		1	tower mounts	Platform Mount [LP 715-1_KCKR]		
74.0	75.0	3	antel	BXA-70063/6CF w/ Mount Pipe	8	1-5/8
		6	commscope	NHH-65B-R2B 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	RRFDC-3315-PF-48		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RF4439D-25A		
		3	samsung telecommunications	RF4440D-13A		
	74.0	1	tower mounts	Platform Mount [LP 303-1]		
		1	tower mounts	Side Arm Mount [SO 102-3]		
54.0	54.0	3	fujitsu	TA08025-B604	1	1-3/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4290426	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4712164	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4943145	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.4.0), 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	88.7 - 47.57	Pole	TP30.46x21.89x0.25	1	-19.832	1428.483	49.4	Pass
L2	47.57 - 0	Pole	TP39.75x29.058x0.313	2	-30.990	2402.767	78.3	Pass
							Summary	
						Pole (L2)	78.3	Pass
						Rating =	78.3	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	57.2	Pass
1	Base Plate		76.0	Pass
1	Base Foundation (Structure)		59.4	Pass
1	Base Foundation (Soil Interaction)		60.7	Pass

Structure Rating (max from all components) =	78.3%

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

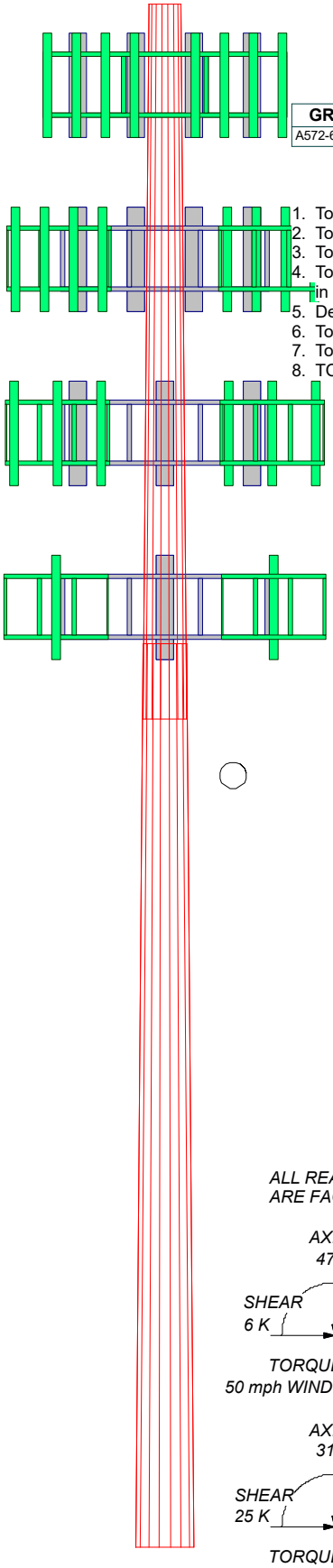
4.1) Recommendations

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	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	41.130	18	0.250	4.330	21.890	30.460	A572-65	2.9
2	51.900	18	0.313		29.058	39.750		6.0
								8.9



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 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 0.000 ft
8. TOWER RATING: 78.3%

ALL REACTIONS ARE FACTORED

AXIAL 47 K

SHEAR 6 K *MOMENT 430 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 31 K

SHEAR 25 K *MOMENT 1753 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 120 mph WIND

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

Job: *BU 842423*			
Project:			
Client: Crown Castle	Drawn by: KSukitch		App'd:
Code: TIA-222-H	Date: 07/12/23		Scale: NTS
Path: C:\Work Area\842423\WO 2244234 - SA\Prod\842423.eri			Dwg No. E-1

Tower Input Data

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

- Tower is located in Windham County, Connecticut.
- Tower base elevation above sea level: 313.000 ft.
- Basic wind speed of 120 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °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 Forces in Supporting Bracing Members
	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*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	88.700-47.570	41.130	4.330	18	21.890	30.460	0.250	1.000	A572-65 (65 ksi)
L2	47.570-0.000	51.900		18	29.058	39.750	0.313	1.250	A572-65

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
									(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	22.189	17.171	1015.912	7.682	11.120	91.358	2033.161	8.587	3.413	13.651
	30.891	23.972	2763.991	10.725	15.474	178.625	5531.618	11.988	4.921	19.684
L2	30.364	28.512	2976.420	10.205	14.761	201.636	5956.757	14.259	4.564	14.605
	40.315	39.117	7686.392	14.000	20.193	380.646	15382.898	19.562	6.446	20.627

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 88.700-47.570				1	1	1			
L2 47.570-0.000				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 klf
*										
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	Surface Ar (CaAa)	64.000 - 0.000	3	3	0.000 0.000	1.996		0.003
*										
*										

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 klf
LDF7-50A(1-5/8)	A	No	No	Inside Pole	84.000 - 0.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
2" Rigid Conduit	A	No	No	Inside Pole	84.000 - 0.000	3	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	84.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
FB-L98B-034-XXXXXX(3/8)	A	No	No	Inside Pole	84.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
WR-VG66ST-BRD_CCIV2(7/8)	A	No	No	Inside Pole	84.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
*									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	74.000 - 0.000	8	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
*							1" Ice	0.000	0.001
CU12PSM9P8XXX (1-3/8)	A	No	No	Inside Pole	54.000 - 0.000	1	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002
*									

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	88.700-47.570	A	0.000	0.000	0.000	0.000	0.873
		B	0.000	0.000	0.000	0.000	0.173
		C	0.000	0.000	9.838	0.000	0.123
L2	47.570-0.000	A	0.000	0.000	0.000	0.000	1.205
		B	0.000	0.000	0.000	0.000	0.312
		C	0.000	0.000	28.485	0.000	0.357

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	88.700-47.570	A	0.913	0.000	0.000	0.000	0.000	0.873
		B		0.000	0.000	0.000	0.000	0.173
		C		0.000	0.000	16.047	0.000	0.234
L2	47.570-0.000	A	0.822	0.000	0.000	0.000	0.000	1.205
		B		0.000	0.000	0.000	0.000	0.312
		C		0.000	0.000	46.462	0.000	0.678

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	88.700-47.570	0.000	1.984	0.000	1.755
L2	47.570-0.000	0.000	4.014	0.000	3.492

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	11	HB158-21U6S24-xxM_TMO(1-5/8)	47.57 - 64.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	11	HB158-21U6S24-xxM_TMO(1-5/8)	0.00 - 47.57	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
** 84 **					
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	84.000
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	84.000
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	84.000
OPA65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	84.000
OPA65R-BU8D w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	84.000
OPA65R-BU8D w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	84.000
OPA-65R-LCUU-H8 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	84.000
OPA-65R-LCUU-H8 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	84.000
OPA-65R-LCUU-H8 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	84.000
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	84.000
DMP65R-BU8D w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	84.000
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	84.000
(2) LGP21401	A	From Leg	4.000 0.000 0.000	0.000	84.000
(2) LGP21401	B	From Leg	4.000 0.000 0.000	0.000	84.000
(2) LGP21401	C	From Leg	4.000 0.000 0.000	0.000	84.000
RRUS-32 B30	A	From Leg	4.000 0.000 0.000	0.000	84.000
RRUS-32 B30	B	From Leg	4.000 0.000	0.000	84.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RRUS-32 B30	C	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS E2 B29	A	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS E2 B29	B	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS E2 B29	C	From Leg	0.000 4.000 0.000	0.000	84.000
DC6-48-60-18-8C-EV	A	From Leg	0.000 2.000 0.000	0.000	84.000
DC6-48-60-18-8C-EV	B	From Leg	0.000 2.000 0.000	0.000	84.000
DC6-48-60-18-8C-EV	C	From Leg	0.000 2.000 0.000	0.000	84.000
RRUS 4478 B14_CCIV2	A	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 4478 B14_CCIV2	B	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 4478 B14_CCIV2	C	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 4449 B5/B12	A	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 4449 B5/B12	B	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 4449 B5/B12	C	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 8843 B2/B66A_CCIV2	A	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 8843 B2/B66A_CCIV2	B	From Leg	0.000 4.000 0.000	0.000	84.000
RRUS 8843 B2/B66A_CCIV2	C	From Leg	0.000 4.000 0.000	0.000	84.000
Platform Mount [LP 715-1_KCKR]	C	None	0.000	0.000	84.000
6' x 2" Mount Pipe	A	From Leg	2.000 0.000	0.000	84.000
6' x 2" Mount Pipe	B	From Leg	3.000 2.000 0.000	0.000	84.000
6' x 2" Mount Pipe	C	From Leg	3.000 2.000 0.000	0.000	84.000
** 74 ** BXA-70063/6CF w/ Mount Pipe	A	From Leg	3.000 4.000 0.000	0.000	74.000
BXA-70063/6CF w/ Mount Pipe	B	From Leg	1.000 4.000 0.000	0.000	74.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
BXA-70063/6CF w/ Mount Pipe	C	From Leg	1.000 4.000 0.000	0.000	74.000
(2) NHH-65B-R2B w/ Mount Pipe	A	From Leg	1.000 4.000 0.000	0.000	74.000
(2) NHH-65B-R2B w/ Mount Pipe	B	From Leg	1.000 4.000 0.000	0.000	74.000
(2) NHH-65B-R2B w/ Mount Pipe	C	From Leg	1.000 4.000 0.000	0.000	74.000
MT6407-77A w/ Mount Pipe	A	From Leg	1.000 4.000 0.000	0.000	74.000
MT6407-77A w/ Mount Pipe	B	From Leg	1.000 4.000 0.000	0.000	74.000
MT6407-77A w/ Mount Pipe	C	From Leg	1.000 4.000 0.000	0.000	74.000
RRFDC-3315-PF-48	A	From Leg	1.000 4.000 0.000	0.000	74.000
DB-T1-6Z-8AB-0Z	A	From Leg	1.000 4.000 0.000	0.000	74.000
RF4439D-25A	A	From Leg	1.000 4.000 0.000	0.000	74.000
RF4439D-25A	B	From Leg	1.000 4.000 0.000	0.000	74.000
RF4439D-25A	C	From Leg	1.000 4.000 0.000	0.000	74.000
RF4440D-13A	A	From Leg	1.000 4.000 0.000	0.000	74.000
RF4440D-13A	B	From Leg	1.000 4.000 0.000	0.000	74.000
RF4440D-13A	C	From Leg	1.000 4.000 0.000	0.000	74.000
Platform Mount [LP 303-1]	C	None	1.000	0.000	74.000
Side Arm Mount [SO 102-3]	C	None		0.000	74.000
Mount Reinforcement Specifications	C	None		0.000	74.000
** 64 **					
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	64.000
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	64.000
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	64.000
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	64.000
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	64.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	64.000
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	64.000
VV-65A-R1_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	64.000
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	64.000
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000 0.000 0.000	0.000	64.000
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000 0.000 0.000	0.000	64.000
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.000 0.000 0.000	0.000	64.000
Radio 4480_TMOV2	A	From Leg	4.000 0.000 0.000	0.000	64.000
Radio 4480_TMOV2	B	From Leg	4.000 0.000 0.000	0.000	64.000
Radio 4480_TMOV2	C	From Leg	4.000 0.000 0.000	0.000	64.000
sitepro 1 RMQP-496-HK	C	None		0.000	64.000
5' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	64.000
5' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	64.000
5' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	64.000
8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	64.000
8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	64.000
8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	64.000
** 54 **					
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	54.000
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	54.000
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	54.000
TA08025-B604	A	From Leg	4.000 0.000 0.000	0.000	54.000
TA08025-B604	B	From Leg	4.000 0.000 0.000	0.000	54.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
TA08025-B604	C	From Leg	4.000 0.000 0.000	0.000	54.000
TA08025-B605	A	From Leg	4.000 0.000 0.000	0.000	54.000
TA08025-B605	B	From Leg	4.000 0.000 0.000	0.000	54.000
TA08025-B605	C	From Leg	4.000 0.000 0.000	0.000	54.000
RDIDC-9181-PF-48	A	From Leg	4.000 0.000 0.000	0.000	54.000
Commscope MC-PK8-DSH	C	None		0.000	54.000
(2) 8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	54.000
(2) 8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	54.000
(2) 8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	54.000
*					

Load Combinations

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

Comb. No.	Description
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	88.7 - 47.57	Pole	Max Tension	27	0.000	0.000	-0.001
			Max. Compression	26	-34.637	0.000	1.109
			Max. Mx	8	-19.850	-488.859	0.413
			Max. My	2	-19.832	0.000	492.662
			Max. Vy	8	22.659	-488.859	0.413
			Max. Vx	2	-22.831	0.000	492.662
			Max. Torque	9			0.914
L2	47.57 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.962	0.000	-0.075
			Max. Mx	8	-30.990	-1740.633	-0.247
			Max. My	14	-30.990	0.000	-1753.005
			Max. Vy	8	25.354	-1740.633	-0.247
			Max. Vx	14	25.518	0.000	-1753.005
			Max. Torque	9			0.914

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	46.962	0.000	-6.349
	Max. H_x	20	31.026	25.310	0.000
	Max. H_z	2	31.026	0.000	25.474
	Max. M_x	2	1752.518	0.000	25.474
	Max. M_z	8	1740.633	-25.310	0.000
	Max. Torsion	9	0.912	-25.310	0.000
	Min. Vert	23	23.270	21.919	12.737
	Min. H_x	8	31.026	-25.310	0.000
	Min. H_z	14	31.026	0.000	-25.474
	Min. M_x	14	-1753.005	0.000	-25.474
	Min. M_z	20	-1740.633	25.310	0.000
	Min. Torsion	21	-0.912	25.310	0.000

Tower Mast Reaction Summary

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 Only	25.855	0.000	0.000	0.208	0.000	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	31.026	0.000	-25.474	-1752.518	0.000	0.000
0.9 Dead+1.0 Wind 0 deg - No Ice	23.270	0.000	-25.474	-1736.878	0.000	0.000
1.2 Dead+1.0 Wind 30 deg - No Ice	31.026	12.655	-22.061	-1517.700	-870.312	-0.453
0.9 Dead+1.0 Wind 30 deg - No Ice	23.270	12.655	-22.061	-1504.161	-862.515	-0.455
1.2 Dead+1.0 Wind 60 deg - No Ice	31.026	21.919	-12.737	-876.145	-1507.433	-0.786
0.9 Dead+1.0 Wind 60 deg - No Ice	23.270	21.919	-12.737	-868.354	-1493.928	-0.788
1.2 Dead+1.0 Wind 90 deg - No Ice	31.026	25.310	-0.000	0.248	-1740.633	-0.909
0.9 Dead+1.0 Wind 90 deg - No Ice	23.270	25.310	-0.000	0.187	-1725.043	-0.912
1.2 Dead+1.0 Wind 120 deg - No Ice	31.026	21.919	12.737	876.638	-1507.429	-0.788
0.9 Dead+1.0 Wind 120 deg - No Ice	23.270	21.919	12.737	868.727	-1493.926	-0.791
1.2 Dead+1.0 Wind 150 deg - No Ice	31.026	12.655	22.061	1518.189	-870.308	-0.456
0.9 Dead+1.0 Wind 150 deg - No Ice	23.270	12.655	22.061	1504.531	-862.512	-0.457
1.2 Dead+1.0 Wind 180 deg - No Ice	31.026	0.000	25.474	1753.005	0.000	0.000
0.9 Dead+1.0 Wind 180 deg - No Ice	23.270	0.000	25.474	1737.247	0.000	0.000
1.2 Dead+1.0 Wind 210 deg - No Ice	31.026	-12.655	22.061	1518.189	870.308	0.456
0.9 Dead+1.0 Wind 210 deg - No Ice	23.270	-12.655	22.061	1504.531	862.512	0.457
1.2 Dead+1.0 Wind 240 deg - No Ice	31.026	-21.919	12.737	876.638	1507.429	0.788
0.9 Dead+1.0 Wind 240 deg - No Ice	23.270	-21.919	12.737	868.727	1493.926	0.791
1.2 Dead+1.0 Wind 270 deg - No Ice	31.026	-25.310	-0.000	0.248	1740.633	0.909
0.9 Dead+1.0 Wind 270 deg - No Ice	23.270	-25.310	-0.000	0.187	1725.043	0.912
1.2 Dead+1.0 Wind 300 deg - No Ice	31.026	-21.919	-12.737	-876.145	1507.433	0.786
0.9 Dead+1.0 Wind 300 deg - No Ice	23.270	-21.919	-12.737	-868.354	1493.928	0.788
1.2 Dead+1.0 Wind 330 deg - No Ice	31.026	-12.655	-22.061	-1517.700	870.312	0.453
0.9 Dead+1.0 Wind 330 deg - No Ice	23.270	-12.655	-22.061	-1504.161	862.515	0.455
1.2 Dead+1.0 Ice+1.0 Temp	46.962	0.000	0.000	0.075	0.000	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	46.962	0.000	-6.349	-429.865	0.000	0.000
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	46.962	3.160	-5.499	-372.273	-213.799	-0.092
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	46.962	5.473	-3.175	-214.926	-370.312	-0.160
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	46.962	6.319	-0.000	0.013	-427.599	-0.185
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	46.962	5.473	3.175	214.951	-370.311	-0.160
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	46.962	3.160	5.499	372.297	-213.799	-0.092
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	46.962	0.000	6.349	429.890	0.000	0.000
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	46.962	-3.160	5.499	372.297	213.799	0.092

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
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	46.962	-5.473	3.175	214.951	370.311	0.160
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	46.962	-6.319	-0.000	0.013	427.599	0.185
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	46.962	-5.473	-3.175	-214.926	370.312	0.160
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	46.962	-3.160	-5.499	-372.273	213.799	0.092
Dead+Wind 0 deg - Service	25.855	0.000	-6.003	-410.808	0.000	0.000
Dead+Wind 30 deg - Service	25.855	2.982	-5.199	-355.743	-204.082	-0.108
Dead+Wind 60 deg - Service	25.855	5.165	-3.001	-205.303	-353.481	-0.187
Dead+Wind 90 deg - Service	25.855	5.964	0.000	0.203	-408.165	-0.216
Dead+Wind 120 deg - Service	25.855	5.165	3.001	205.708	-353.481	-0.187
Dead+Wind 150 deg - Service	25.855	2.982	5.199	356.149	-204.082	-0.108
Dead+Wind 180 deg - Service	25.855	0.000	6.003	411.214	0.000	0.000
Dead+Wind 210 deg - Service	25.855	-2.982	5.199	356.149	204.082	0.108
Dead+Wind 240 deg - Service	25.855	-5.165	3.001	205.708	353.481	0.187
Dead+Wind 270 deg - Service	25.855	-5.964	0.000	0.203	408.165	0.216
Dead+Wind 300 deg - Service	25.855	-5.165	-3.001	-205.303	353.481	0.187
Dead+Wind 330 deg - Service	25.855	-2.982	-5.199	-355.743	204.082	0.108

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	0.000	-25.855	0.000	0.000	25.855	0.000	0.000%
2	0.000	-31.026	-25.474	0.000	31.026	25.474	0.000%
3	0.000	-23.270	-25.474	0.000	23.270	25.474	0.000%
4	12.655	-31.026	-22.061	-12.655	31.026	22.061	0.000%
5	12.655	-23.270	-22.061	-12.655	23.270	22.061	0.000%
6	21.919	-31.026	-12.737	-21.919	31.026	12.737	0.000%
7	21.919	-23.270	-12.737	-21.919	23.270	12.737	0.000%
8	25.310	-31.026	0.000	-25.310	31.026	0.000	0.000%
9	25.310	-23.270	0.000	-25.310	23.270	0.000	0.000%
10	21.919	-31.026	12.737	-21.919	31.026	-12.737	0.000%
11	21.919	-23.270	12.737	-21.919	23.270	-12.737	0.000%
12	12.655	-31.026	22.061	-12.655	31.026	-22.061	0.000%
13	12.655	-23.270	22.061	-12.655	23.270	-22.061	0.000%
14	0.000	-31.026	25.474	0.000	31.026	-25.474	0.000%
15	0.000	-23.270	25.474	0.000	23.270	-25.474	0.000%
16	-12.655	-31.026	22.061	12.655	31.026	-22.061	0.000%
17	-12.655	-23.270	22.061	12.655	23.270	-22.061	0.000%
18	-21.919	-31.026	12.737	21.919	31.026	-12.737	0.000%
19	-21.919	-23.270	12.737	21.919	23.270	-12.737	0.000%
20	-25.310	-31.026	0.000	25.310	31.026	0.000	0.000%
21	-25.310	-23.270	0.000	25.310	23.270	0.000	0.000%
22	-21.919	-31.026	-12.737	21.919	31.026	12.737	0.000%
23	-21.919	-23.270	-12.737	21.919	23.270	12.737	0.000%
24	-12.655	-31.026	-22.061	12.655	31.026	22.061	0.000%
25	-12.655	-23.270	-22.061	12.655	23.270	22.061	0.000%
26	0.000	-46.962	0.000	0.000	46.962	0.000	0.000%
27	0.000	-46.962	-6.349	0.000	46.962	6.349	0.000%
28	3.160	-46.962	-5.499	-3.160	46.962	5.499	0.000%
29	5.473	-46.962	-3.175	-5.473	46.962	3.175	0.000%
30	6.319	-46.962	0.000	-6.319	46.962	0.000	0.000%
31	5.473	-46.962	3.175	-5.473	46.962	-3.175	0.000%
32	3.160	-46.962	5.499	-3.160	46.962	-5.499	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.000	-46.962	6.349	0.000	46.962	-6.349	0.000%
34	-3.160	-46.962	5.499	3.160	46.962	-5.499	0.000%
35	-5.473	-46.962	3.175	5.473	46.962	-3.175	0.000%
36	-6.319	-46.962	0.000	6.319	46.962	0.000	0.000%
37	-5.473	-46.962	-3.175	5.473	46.962	3.175	0.000%
38	-3.160	-46.962	-5.499	3.160	46.962	5.499	0.000%
39	0.000	-25.855	-6.003	0.000	25.855	6.003	0.000%
40	2.982	-25.855	-5.199	-2.982	25.855	5.199	0.000%
41	5.165	-25.855	-3.001	-5.165	25.855	3.001	0.000%
42	5.964	-25.855	0.000	-5.964	25.855	0.000	0.000%
43	5.165	-25.855	3.001	-5.165	25.855	-3.001	0.000%
44	2.982	-25.855	5.199	-2.982	25.855	-5.199	0.000%
45	0.000	-25.855	6.003	0.000	25.855	-6.003	0.000%
46	-2.982	-25.855	5.199	2.982	25.855	-5.199	0.000%
47	-5.165	-25.855	3.001	5.165	25.855	-3.001	0.000%
48	-5.964	-25.855	0.000	5.964	25.855	0.000	0.000%
49	-5.165	-25.855	-3.001	5.165	25.855	3.001	0.000%
50	-2.982	-25.855	-5.199	2.982	25.855	5.199	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	0.00007298
3	Yes	4	0.00000001	0.00002356
4	Yes	5	0.00000001	0.00020209
5	Yes	5	0.00000001	0.00008935
6	Yes	5	0.00000001	0.00021025
7	Yes	5	0.00000001	0.00009334
8	Yes	4	0.00000001	0.00028940
9	Yes	4	0.00000001	0.00017948
10	Yes	5	0.00000001	0.00019968
11	Yes	5	0.00000001	0.00008829
12	Yes	5	0.00000001	0.00020808
13	Yes	5	0.00000001	0.00009225
14	Yes	4	0.00000001	0.00007303
15	Yes	4	0.00000001	0.00002357
16	Yes	5	0.00000001	0.00020808
17	Yes	5	0.00000001	0.00009225
18	Yes	5	0.00000001	0.00019968
19	Yes	5	0.00000001	0.00008829
20	Yes	4	0.00000001	0.00028940
21	Yes	4	0.00000001	0.00017948
22	Yes	5	0.00000001	0.00021025
23	Yes	5	0.00000001	0.00009334
24	Yes	5	0.00000001	0.00020209
25	Yes	5	0.00000001	0.00008935
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00071326
28	Yes	4	0.00000001	0.00086514
29	Yes	4	0.00000001	0.00086870
30	Yes	4	0.00000001	0.00070811
31	Yes	4	0.00000001	0.00085672
32	Yes	4	0.00000001	0.00086291
33	Yes	4	0.00000001	0.00070881
34	Yes	4	0.00000001	0.00086291
35	Yes	4	0.00000001	0.00085672
36	Yes	4	0.00000001	0.00070811
37	Yes	4	0.00000001	0.00086870
38	Yes	4	0.00000001	0.00086514
39	Yes	4	0.00000001	0.00000939
40	Yes	4	0.00000001	0.00008468
41	Yes	4	0.00000001	0.00009688
42	Yes	4	0.00000001	0.00002086
43	Yes	4	0.00000001	0.00008192
44	Yes	4	0.00000001	0.00009307
45	Yes	4	0.00000001	0.00000938
46	Yes	4	0.00000001	0.00009307
47	Yes	4	0.00000001	0.00008192
48	Yes	4	0.00000001	0.00002086
49	Yes	4	0.00000001	0.00009688
50	Yes	4	0.00000001	0.00008468

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88.7 - 47.57	10.942	39	0.943	0.002
L2	51.9 - 0	4.195	39	0.719	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
84.000	7770.00 w/ Mount Pipe	39	9.982	0.921	0.001	25479
74.000	BXA-70063/6CF w/ Mount Pipe	39	7.984	0.873	0.001	8666
64.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	39	6.124	0.814	0.001	5157
54.000	MX08FRO665-21 w/ Mount Pipe	39	4.498	0.738	0.001	3700

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88.7 - 47.57	46.657	2	4.020	0.006
L2	51.9 - 0	17.897	2	3.067	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
84.000	7770.00 w/ Mount Pipe	2	42.565	3.930	0.006	6027
74.000	BXA-70063/6CF w/ Mount Pipe	2	34.050	3.724	0.005	2048
64.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	2	26.124	3.474	0.004	1218
54.000	MX08FRO665-21 w/ Mount Pipe	2	19.190	3.148	0.004	872

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	88.7 - 47.57 (1)	TP30.46x21.89x0.25	41.130	0.000	0.0	23.256	-19.832	1360.460	0.015
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	51.900	0.000	0.0	39.117	-30.990	2288.350	0.014

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	88.7 - 47.57 (1)	TP30.46x21.89x0.25	492.663	982.733	0.501	0.000	982.733	0.000
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	1753.008	2172.667	0.807	0.000	2172.667	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	88.7 - 47.57 (1)	TP30.46x21.89x0.25	22.831	408.138	0.056	0.000	1047.542	0.000
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	25.518	686.505	0.037	0.000	2371.008	0.000

Pole Interaction Design Data

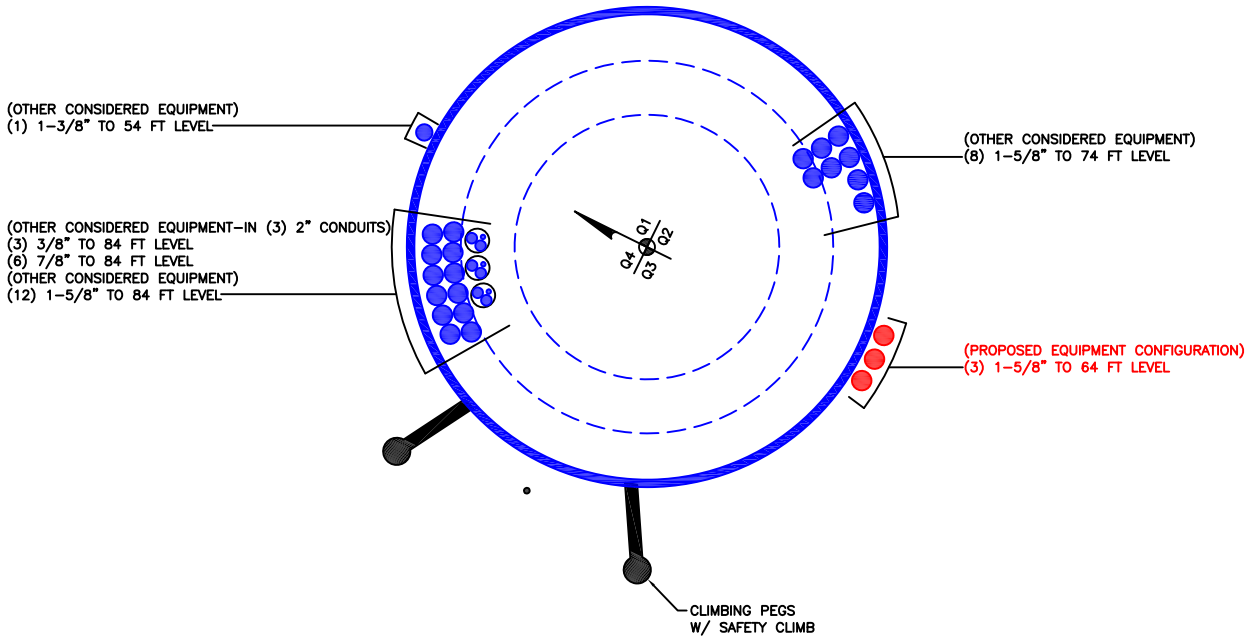
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	88.7 - 47.57 (1)	0.015	0.501	0.000	0.056	0.000	0.519	1.050	4.8.2
L2	47.57 - 0 (2)	0.014	0.807	0.000	0.037	0.000	0.822	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	88.7 - 47.57	Pole	TP30.46x21.89x0.25	1	-19.832	1428.483	49.4	Pass
L2	47.57 - 0	Pole	TP39.75x29.058x0.313	2	-30.990	2402.767	78.3	Pass
							Summary	
						Pole (L2)	78.3	Pass
						RATING =	**78.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 1-3/8" TO 54 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN (3) 2" CONDUITS)
(3) 3/8" TO 84 FT LEVEL
(6) 7/8" TO 84 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 84 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(8) 1-5/8" TO 74 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 64 FT LEVEL
Q1
Q2
Q3
Q4
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

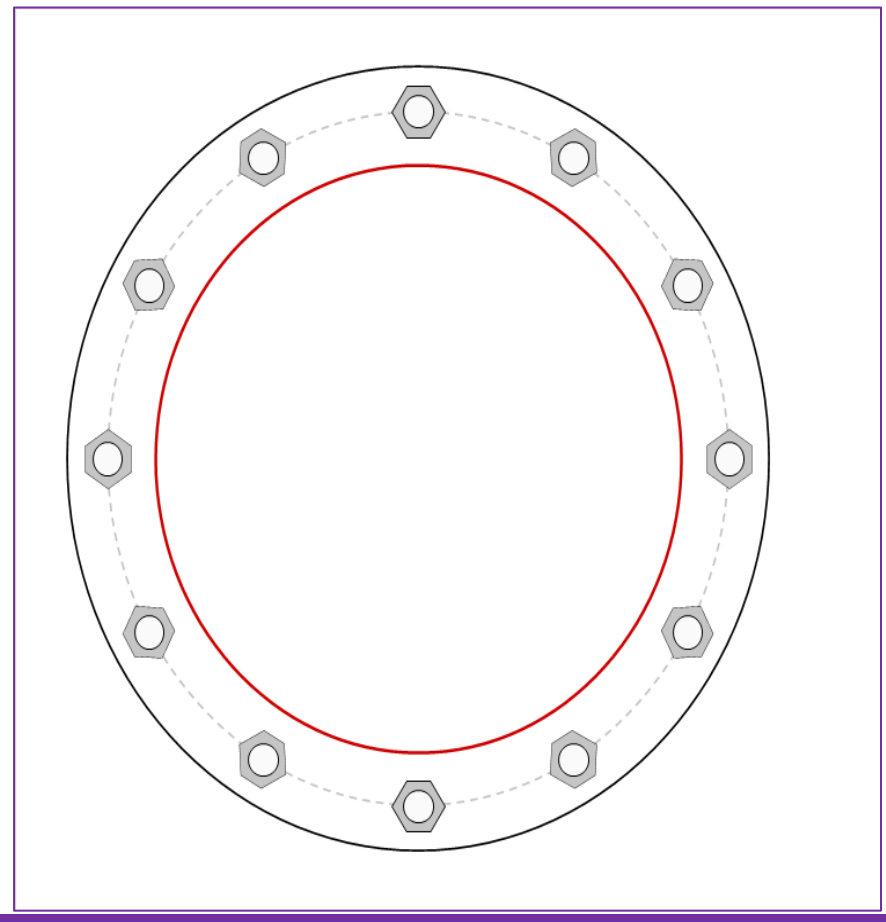
Monopole Base Plate Connection

Site Info	
BU #	842423
Site Name	HAM NORTH RIDGE RC
Order #	573238 - Rev. 7

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	3.25

Applied Loads	
Moment (kip-ft)	1753.01
Axial Force (kips)	30.99
Shear Force (kips)	25.52

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 47" BC

Base Plate Data

53" OD x 1.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

39.75" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 146.47	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.13	ϕVn = 149.1	**57.2%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	43.11	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**76.0%**	**Pass**

Pier and Pad Foundation

BU # :	842423
Site Name:	WINDHAM NORTH
App. Number:	573238 - Rev. 7

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	31.03	kips
Base Shear, Vu_comp:	25.47	kips
Moment, M_u:	1753	ft-kips
Tower Height, **H**:	88.7	ft
BP Dist. Above Fdn, bp_{dist}:	5.5	in

Pier Properties

Pier Shape:	Circular	
Pier Diameter, **dpier**:	6	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	22	
Pier Tie/Spiral Size, **St**:	3	
Pier Tie/Spiral Quantity, **mt**:	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	6	ft
Pad Width, W_1:	20	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	9	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	11	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	120	pcf
Ultimate Net Bearing, Qnet:	16.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	99	
Base Friction, μ:	0.5	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	n/a	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	187.63	25.47	**12.9%**	**Pass**
Bearing Pressure (ksf)	12.54	2.27	**18.1%**	**Pass**
*Overturning (kip*ft)*	3202.28	1942.96	**60.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	2973.10	1854.88	**59.4%**	**Pass**
Pier Compression (kip)	13497.04	51.39	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	1523.05	709.36	**44.4%**	**Pass**
Pad Shear - 1-way (kips)	617.33	129.91	**20.0%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.024	**13.9%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	2142.83	1112.93	**49.5%**	**Pass**

**Rating per TIA-222-H Section 15.5*

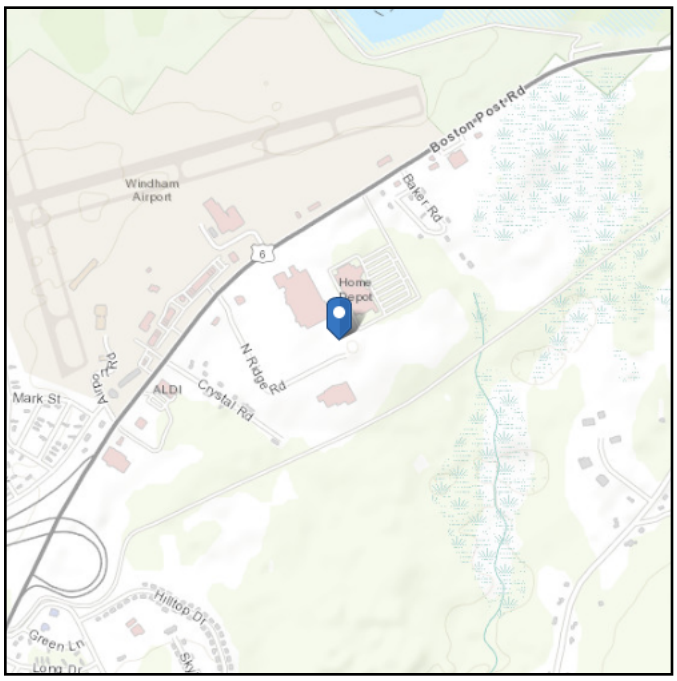
Structural Rating*:	**59.4%**
Soil Rating*:	**60.7%**

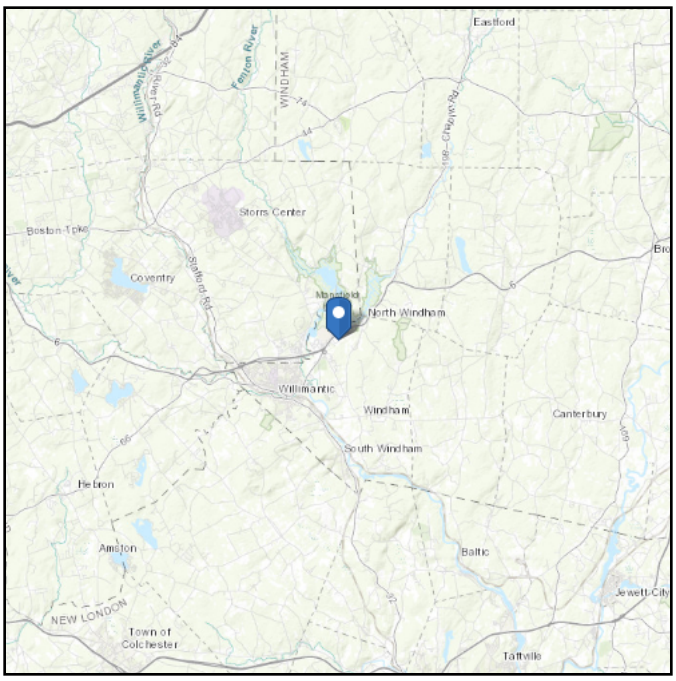
Version 4.1.1

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.739869
Risk Category:	II	**Longitude:**	-72.172908
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	312.63 ft (NAVD 88)





Wind

Results:

Wind Speed	120 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	93 Vmph
100-year MRI	99 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 Dec 02 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.

Seismic

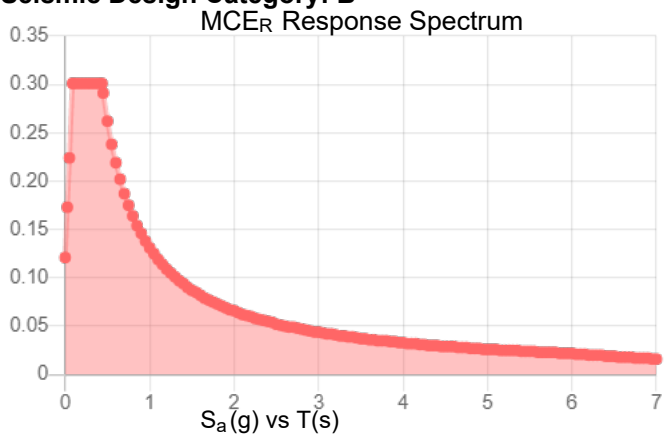
D - Default (see Section 11.4.3)

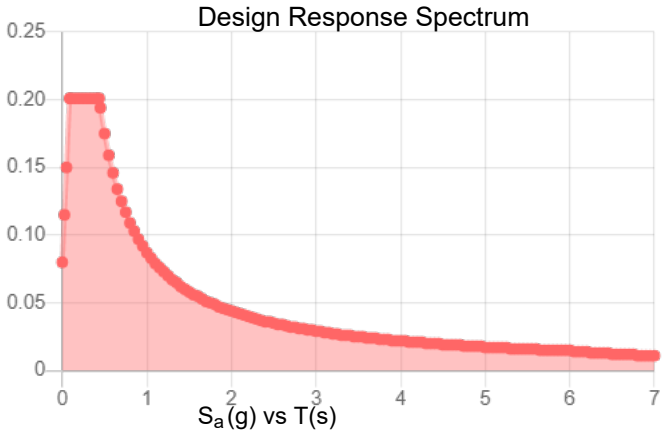
Site Soil Class:

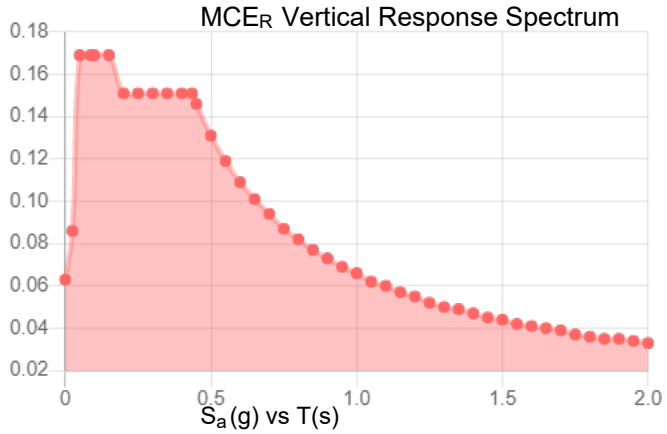
Results:

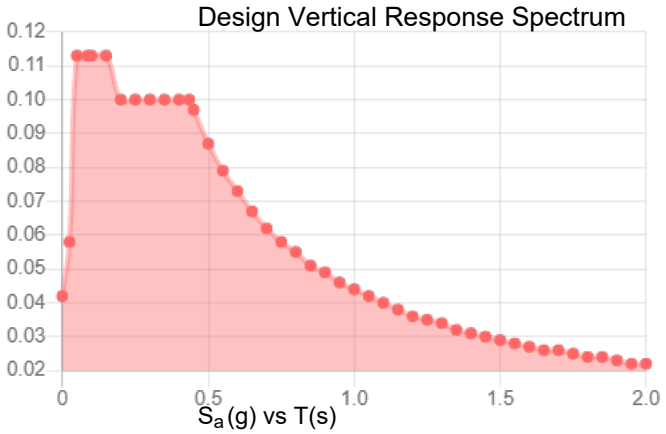
S_S :	0.188	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.102
F_v :	2.4	PGA_M :	0.163
S_{MS} :	0.301	F_{PGA} :	1.596
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.201	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri Dec 02 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:	Fri Dec 02 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.

Radio Frequency Exposure Analysis Report

July 21, 2023

T-Mobile

Site Name/Site Number: CTNL200A

Site Address: 10 N Ridge Dr, North Windham, CT 06256

Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
Connecticut License Number 33928
Expires January 31, 2024

Signed 21 July 2023

Site Compliance Summary

T-Mobile Compliance Status:	Compliant
Cumulative Calculated Power Density (Ground Level):	116.52417 µW/cm^2
Cumulative General Population % MPE (Ground Level):	11.65549%

July 21, 2023

Centerline
Attn: Peter Fales, Senior Program Manager
750 W Center St, Suite 301
West Bridgewater, MA 02379

RF Exposure Analysis for Site: **CTNL200A**

Centerline Communications, LLC ("Centerline") was contracted to analyze the proposed T-Mobile facility at **10 N Ridge Dr, North Windham, CT 06256** for the purpose of determining whether the predictive exposure from the proposed facility is within specified federal limits.

All information used in this report was analyzed as a percentage of the Maximum Permissible Exposure (% MPE) limits as detailed in 47 CFR § 1.1310 as well as Federal Communications Commission (FCC) OET Bulletin 65 Edition 97-01. The FCC MPE limits are typically expressed in units of milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$). The exposure limits vary depending upon the frequencies being utilized. The General Population/Uncontrolled MPE limit (in mW/cm^2) for frequencies between 300 and 1500 is defined as frequency (in MHz) divided by 1500 ($f_{MHz}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of 1 mW/cm^2 (1000 $\mu W/cm^2$). The calculated power density at each sample point divided by the limit at each calculated frequency provides a result in % MPE. Summing the calculated % MPE from all contributors provides a cumulative % MPE at a particular sample point. Wireless carriers use different frequency bands with varying MPE limits; therefore, it is useful to report results in terms of % MPE as opposed to power density.

All results were compared to the FCC radio frequency exposure rules as detailed in 47 CFR § 1.1307(b) to determine compliance with the MPE limits for General Population/Uncontrolled environments as defined below.

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

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/ controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Additional details can be found in FCC OET 65.

Calculation Methodology

Centerline Communications, LLC has performed theoretical modeling of the site using a software tool, RoofMaster®, which incorporates calculation methodologies detailed in FCC OET 65. RoofMaster® uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations, the power decreases inversely with the square of the distance. The modeling is based on worst-case assumptions in terms of transmitter power and duty cycle. No losses were included in the power calculations unless they were specifically provided for the project.

In OET 65, a far field model is presented to calculate the spatial peak power density. The RoofMaster® implementation of this model incorporates antenna manufacturer's horizontal and vertical pattern data to determine the power density in all directions. This model yields the power density at a single point in space. In order to determine the spatial power density for comparison to the FCC limits, the average of several points calculated within the human profile (0-6') must be conducted. RoofMaster® calculates seven power density values between 0-6' above the specified study plane and performs a linear spatial average.

Data & Results

The following table details the antennas and operating parameters for the T-Mobile antenna system as well as any other antenna systems at the site. This is based on antenna information provided by the client and data compiled from other sources where necessary. The data below was input into Roofmaster® to perform the theoretical exposure calculations at ground level.

The theoretical calculations performed in Roofmaster® determine the cumulative exposure at all sample points at ground level (0-6' spatial average). The results from highest cumulative sample point at ground level surrounding the site are displayed in the table below. The contribution from directional antennas to the maximum cumulative totals varies greatly depending on location; therefore, the contribution from one antenna sector at the highest calculated exposure point may be greater or less than other sectors since sectorized directional antennas are pointed in different directions and there is not much overlapping exposure.

The contribution to the cumulative power density and % MPE for each antenna/frequency band is listed in the table(s) below. The cumulative power density and cumulative % MPE are displayed at the bottom of the table(s) below.

CENTERLINE

Maximum Calculated Cumulative Power Density @ Ground Level
(Location: approximately 174' NE of site)

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ($\mu W/cm^2$)	General Population MPE Limit ($\mu W/cm^2$)	General Population % MPE
T-Mobile A 1	COMMSCOPE VV-65A-R1	1900	15.77	64.00	2.00	140.00	10572.02	0.00652	1000.00	0.00065
T-Mobile A 1	COMMSCOPE VV-65A-R1	2100	16.47	64.00	2.00	140.00	12421.04	0.00629	1000.00	0.00063
T-Mobile A 1	COMMSCOPE VV-65A-R1	1900	15.77	64.00	1.00	15.00	566.36	0.00035	1000.00	0.00004
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	700	13.65	64.00	2.00	40.00	1853.92	0.00165	466.67	0.00035
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	4.00	60.00	4733.81	0.00449	400.00	0.00112
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	2.00	40.00	1577.94	0.00150	400.00	0.00037
T-Mobile A 3	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00067	1000.00	0.00007
T-Mobile A 3	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00067	1000.00	0.00007
T-Mobile A 3	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	57.01567	1000.00	5.70157
T-Mobile A 3	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	57.01567	1000.00	5.70157
T-Mobile B 4	COMMSCOPE VV-65A-R1	1900	15.77	64.00	2.00	140.00	10572.02	0.00001	1000.00	0.00000
T-Mobile B 4	COMMSCOPE VV-65A-R1	2100	16.47	64.00	2.00	140.00	12421.04	0.00001	1000.00	0.00000
T-Mobile B 4	COMMSCOPE VV-65A-R1	1900	15.77	64.00	1.00	15.00	566.36	0.00000	1000.00	0.00000
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	700	13.65	64.00	2.00	40.00	1853.92	0.00000	466.67	0.00000
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	4.00	60.00	4733.81	0.00003	400.00	0.00001
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	2.00	40.00	1577.94	0.00001	400.00	0.00000
T-Mobile B 6	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00000	1000.00	0.00000
T-Mobile B 6	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00000	1000.00	0.00000
T-Mobile B 6	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	0.51522	1000.00	0.05152
T-Mobile B 6	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	0.51522	1000.00	0.05152
T-Mobile C 7	COMMSCOPE VV-65A-R1	1900	15.77	64.00	2.00	140.00	10572.02	0.00003	1000.00	0.00000
T-Mobile C 7	COMMSCOPE VV-65A-R1	2100	16.47	64.00	2.00	280.00	12421.04	0.00001	1000.00	0.00000
T-Mobile C 7	COMMSCOPE VV-65A-R1	1900	15.77	64.00	1.00	15.00	566.36	0.00000	1000.00	0.00000
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	700	13.65	64.00	2.00	80.00	1853.92	0.00002	466.67	0.00000
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	4.00	240.00	4733.81	0.00002	400.00	0.00000
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	600	12.95	64.00	2.00	80.00	1577.94	0.00001	400.00	0.00000
T-Mobile C 9	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00000	1000.00	0.00000
T-Mobile C 9	ERICSSON AIR6449	2500	15.15	64.00	1.00	30.00	982.02	0.00000	1000.00	0.00000
T-Mobile C 9	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	0.68706	1000.00	0.06871
T-Mobile C 9	ERICSSON AIR6449	2500	22.35	64.00	1.00	90.00	15461.18	0.68706	1000.00	0.06871
AT&T A 10	POWERWAVE 7770 00	850	11.35	84.00	1.00	40.00	545.83	0.00032	566.67	0.00006
AT&T A 11	CCI DMP65R-BU8D	700	12.25	84.00	2.00	80.00	1343.04	0.00095	466.67	0.00020
AT&T A 11	CCI DMP65R-BU8D	2300	14.25	84.00	4.00	100.00	2660.73	0.00132	1000.00	0.00013
AT&T A 12	CCI OPA-65R-LCUU-H8	700	12.76	84.00	4.00	160.00	3020.79	0.00206	466.67	0.00044
AT&T A 12	CCI OPA-65R-LCUU-H8-	1900	14.76	84.00	4.00	160.00	4787.62	0.00176	1000.00	0.00018

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density (μW/cm²)	General Population MPE Limit (μW/cm²)	General Population % MPE
AT&T A 12	CCI OPA-65R-LCUU-H8-	2100	14.96	84.00	4.00	160.00	5013.26	0.00174	1000.00	0.00017
AT&T A 13	CCI OPA65R-BU8D	700	13.15	84.00	4.00	160.00	3304.61	0.00211	466.67	0.00045
AT&T A 13	CCI OPA65R-BU8D	850	13.75	84.00	4.00	160.00	3794.20	0.00216	566.67	0.00038
AT&T B 14	POWERWAVE 7770 00	850	11.35	84.00	1.00	40.00	545.83	0.00000	566.67	0.00000
AT&T B 15	CCI DMP65R-BU8D	700	12.25	84.00	2.00	80.00	1343.04	0.00000	466.67	0.00000
AT&T B 15	CCI DMP65R-BU8D	2300	14.25	84.00	4.00	100.00	2660.73	0.00000	1000.00	0.00000
AT&T B 16	CCI OPA-65R-LCUU-H8	700	12.76	84.00	4.00	160.00	3020.79	0.00001	466.67	0.00000
AT&T B 16	CCI OPA-65R-LCUU-H8-	1900	14.76	84.00	4.00	160.00	4787.62	0.00000	1000.00	0.00000
AT&T B 16	CCI OPA-65R-LCUU-H8-	2100	14.96	84.00	4.00	160.00	5013.26	0.00000	1000.00	0.00000
AT&T B 17	CCI OPA65R-BU8D	700	13.15	84.00	4.00	160.00	3304.61	0.00000	466.67	0.00000
AT&T B 17	CCI OPA65R-BU8D	850	13.75	84.00	4.00	160.00	3794.20	0.00000	566.67	0.00000
AT&T C 18	POWERWAVE 7770 00	850	11.35	84.00	1.00	40.00	545.83	0.00000	566.67	0.00000
AT&T C 19	CCI DMP65R-BU8D	700	12.25	84.00	2.00	80.00	1343.04	0.00000	466.67	0.00000
AT&T C 19	CCI DMP65R-BU8D	2300	14.25	84.00	4.00	100.00	2660.73	0.00000	1000.00	0.00000
AT&T C 20	CCI OPA-65R-LCUU-H8	700	12.76	84.00	4.00	160.00	3020.79	0.00001	466.67	0.00000
AT&T C 20	CCI OPA-65R-LCUU-H8-	1900	14.76	84.00	4.00	160.00	4787.62	0.00000	1000.00	0.00000
AT&T C 20	CCI OPA-65R-LCUU-H8-	2100	14.96	84.00	4.00	160.00	5013.26	0.00000	1000.00	0.00000
AT&T C 21	CCI OPA65R-BU8D	700	13.15	84.00	4.00	160.00	3304.61	0.00000	466.67	0.00000
AT&T C 21	CCI OPA65R-BU8D	850	13.75	84.00	4.00	160.00	3794.20	0.00000	566.67	0.00000
Verizon A 22	ANTEL BXA-70063-6CF	850	14.50	75.00	7.00	140.00	3945.74	0.00198	566.67	0.00035
Verizon A 23	COMMSCOPE NHH-65B-R2B	700	12.29	75.00	4.00	160.00	2710.94	0.00219	466.67	0.00047
Verizon A 23	COMMSCOPE NHH-65B-R2B	1900	15.65	75.00	4.00	160.00	5876.52	0.00206	1000.00	0.00021
Verizon A 24	COMMSCOPE NHH-65B-R2B	850	12.70	75.00	4.00	160.00	2979.34	0.00237	566.67	0.00042
Verizon A 24	COMMSCOPE NHH-65B-R2B	2100	16.22	75.00	4.00	160.00	6700.70	0.00222	1000.00	0.00022
Verizon A 25	SAMSUNG MT6407	3700	23.35	74.00	4.00	200.00	43254.37	0.02695	1000.00	0.00270
Verizon B 26	ANTEL BXA-70063-6CF	850	14.50	75.00	7.00	140.00	3945.74	0.00000	566.67	0.00000
Verizon B 27	COMMSCOPE NHH-65B-R2B	700	12.29	75.00	4.00	160.00	2710.94	0.00001	466.67	0.00000
Verizon B 27	COMMSCOPE NHH-65B-R2B	1900	15.65	75.00	4.00	160.00	5876.52	0.00000	1000.00	0.00000
Verizon B 28	COMMSCOPE NHH-65B-R2B	850	12.70	75.00	4.00	160.00	2979.34	0.00000	566.67	0.00000
Verizon B 28	COMMSCOPE NHH-65B-R2B	2100	16.22	75.00	4.00	160.00	6700.70	0.00000	1000.00	0.00000
Verizon B 29	SAMSUNG MT6407	3700	23.35	74.00	4.00	200.00	43254.37	0.00060	1000.00	0.00006
Verizon C 30	ANTEL BXA-70063-6CF	850	14.50	75.00	7.00	140.00	3945.74	0.00000	566.67	0.00000
Verizon C 31	COMMSCOPE NHH-65B-R2B	700	12.29	75.00	4.00	160.00	2710.94	0.00001	466.67	0.00000
Verizon C 31	COMMSCOPE NHH-65B-R2B	1900	15.65	75.00	4.00	160.00	5876.52	0.00000	1000.00	0.00000
Verizon C 32	COMMSCOPE NHH-65B-R2B	850	12.70	75.00	4.00	160.00	2979.34	0.00000	566.67	0.00000
Verizon C 32	COMMSCOPE NHH-65B-R2B	2100	16.22	75.00	4.00	160.00	6700.70	0.00000	1000.00	0.00000
Verizon C 33	SAMSUNG MT6407	3700	23.35	74.00	4.00	200.00	43254.37	0.00065	1000.00	0.00007

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ($\mu W/cm^2$)	General Population MPE Limit ($\mu W/cm^2$)	General Population % MPE
Dish A 34	JMA MX08FRO665-21	600	11.35	54.00	4.00	120.00	1637.50	0.00415	400.00	0.00104
Dish A 34	JMA MX08FRO665-21	1900	15.75	54.00	4.00	160.00	6013.40	0.00562	1000.00	0.00056
Dish A 34	JMA MX08FRO665-21	2100	16.75	54.00	4.00	160.00	7570.42	0.00470	1000.00	0.00047
Dish B 35	JMA MX08FRO665-21	600	11.35	54.00	4.00	120.00	1637.50	0.00001	400.00	0.00000
Dish B 35	JMA MX08FRO665-21	1900	15.75	54.00	4.00	160.00	6013.40	0.00001	1000.00	0.00000
Dish B 35	JMA MX08FRO665-21	2100	16.75	54.00	4.00	160.00	7570.42	0.00000	1000.00	0.00000
Dish C 36	JMA MX08FRO665-21	600	11.35	54.00	4.00	120.00	1637.50	0.00000	400.00	0.00000
Dish C 36	JMA MX08FRO665-21	1900	15.75	54.00	4.00	160.00	6013.40	0.00001	1000.00	0.00000
Dish C 36	JMA MX08FRO665-21	2100	16.75	54.00	4.00	160.00	7570.42	0.00000	1000.00	0.00000
							Cumulative Power Density:	**116.52417 $\mu W/cm^2$**	**Cumulative % MPE:**	**11.65549%**

Summary

The theoretical calculations performed for this analysis yielded cumulative power density totals in all areas at ground level that are within the allowable federal limits for public exposure to RF energy. Therefore, the site is **compliant** with FCC rules and regulations.

Michelle Stone
RF EME Technical Writer II
Centerline Communications, LLC