Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

March 2, 2023

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

Re: **EM-VER-104-221024 – Cellco Partnership d/b/a Verizon Wireless – 2 Hinckley Hill Road, Norwich, Connecticut**

Dear Attorney Bachman:

Pursuant to Condition No. 1 of the Siting Council's December 19, 2022 approval of EM-VER-104-221024, enclosed is a revised Structural Analysis referencing the recently revised Connecticut State Building Code, effective October 1, 2022.

The Council's December 19, 2022 approval letter also required the submission of an RF Analysis that includes a cumulative far-field analysis for all entities on the tower. The cumulative RF table including Verizon's far-field analysis consistent with the Council's recent directive was included in the initial filing dated October 19, 2022. An additional copy of the analysis is attached for your convenience.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachments

PAUL J. FORD & COMPANY

Report Date: January 11, 2023

Client: Everest Infrastructure Partners
Two Allegheny Center
Pittsburgh, PA 15212
Attn: Thomas Rigg
(603) 498-7462
tom.rigg@everestinfrastructure.com

Structure: Existing 150-ft Self Support Tower
Site Name: Norwich CDT
Site Reference #: 702499
Site Address: 2 Hinkley Hill Rd
City, County, State: Preston, New London County, CT
Latitude, Longitude: 41.514847°, -72.061689°

PJF Project: A13321-0008.005.8700

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Analysis Criteria:
This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Proposed Appurtenance Loads:
The structure was analyzed with the proposed loading configuration shown in Table 1 combined with the other considered equipment shown in Table 2 of this report.

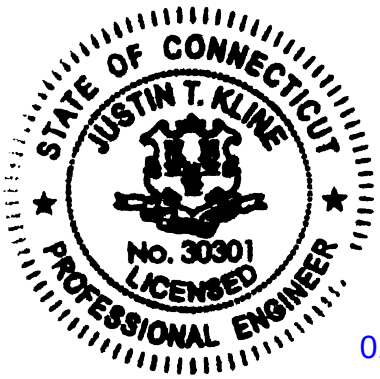
Summary of Analysis Results:

Existing Structure:	Pass – 71.6%
Existing Foundation:	Pass – 60.2%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Everest Infrastructure Partners. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Anna Trudo, E.I.
Structural Designer
atrudo@pauljford.com



01/11/2023

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Self Support tower designed by Fred A Nudd Corporation in July of 1999. All tower geometry and foundation information were taken from a previous structural analysis by Fred Nudd Corp dated 6/11/2018.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
126.0	127.5	3	commscope	CBC78T-DS-43-2X	11 2	1-5/8 hybrid
		6	commscope	JAHH-65B-R3B w/ Mount Pipe		
		1	raycap	DB-B1-6C-12AB-0Z		
		1	raycap	RRFDC-3315-PF-48		
		6	rfs celwave	APL868013 w/ Mount Pipe		
		3	samsung telecommunications	B2/B66A RRH-BR049		
		3	samsung telecommunications	B5/B13 RRH-BR04C		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
	126.0	3	commscope	BSAMNT-SBS-2-2 (Mount Bracket)		
		1	tower mounts	Sector Mount [SM 802-3] with mount modifications		

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)
150.0	150.0	3	ericsson	AIR 32 B66AA B2P_T-MOBILE w/ Mount Pipe	6 3	1-5/8 1-1/4
		3	ericsson	AIR 6449 B41 w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	tower mounts	Site Pro 1 VFA12-HD		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	6	alcatel lucent	1900 MHz 4x45W RRH	4	1-1/4
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
		3	commscope	DT465B-2XR w/ Mount Pipe		
		3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe		
		1	tower mounts	Sector Mount [SM 802-3]		
115.0	115.0	2	cci antennas	DMP65R-BU6D w/ Mount Pipe	6 8 2	1-1/4 DC cable fiber
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		1	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66A		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS E2 B29		
		2	kmw communications	EPBQ-654L8H6-L2 w/ Mount Pipe		
		1	kmw communications	EPBQ-654L8H8-L2 w/ Mount Pipe		
		3	powerwave technologies	7770_TIA w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		4	raycap	DC6-48-60-18-8F		
		3	tower mounts	Site Pro 1 VFA12-HD		
105.0	105.0	3	fujitsu	TA08025-B604	1	1-5/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	mounts	Sabre_C10837002C-32788_Sector_(3)		
		1	raycap	RDIDC-9181-PF-48		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Source
Tower Structural Analysis	Nudd Corp #118-23067 dated 6/11/2018	on file
Mount Analysis and PMI Requirements	Verizon/Maser #16227609 dated 11/24/2021	emailed
Mount Modification CDs	Verizon/Maser #16227609 dated 11/24/2021	emailed

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.

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.
3) All tower geometry and foundation information were taken from a previous structural analysis by Fred Nudd Corp dated 6/11/2018.
4) The antenna feedlines are assumed to be placed as indicated in Appendix B.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company 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 (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	150 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-8288	68548	12.1	Pass
T2	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	21	-45870	65992	69.5	Pass
T3	120 - 100	Leg	Pipe 4.5" x 0.237" (4 STD)	48	-96504	145239	66.4	Pass
T4	100 - 80	Leg	Pipe 5.563" x 0.258" (5 STD)	75	-138483	193371	71.6	Pass
T5	80 - 60	Leg	Pipe 6.625" x 0.280" (6 STD)	94	-176573	260722	67.7	Pass
T6	60 - 40	Leg	Pipe 8.625" x 0.322" (8 STD)	115	-211659	407043	52.0	Pass
T7	40 - 20	Leg	Pipe 8.625" x 0.50" (8 XS)	136	-242205	577644	41.9	Pass
T8	20 - 0	Leg	Pipe 8.625" x 0.50" (8 XS)	151	-272753	577644	47.2	Pass
T1	150 - 140	Diagonal	L 1.5 x 1.5 x 3/16	9	-2339	8110	28.8 33.1 (b)	Pass
T2	140 - 120	Diagonal	L 2 x 2 x 3/16	24	-6369	16696	38.1 62.1 (b)	Pass
T3	120 - 100	Diagonal	L 2 x 2 x 3/16	54	-6751	12621	53.5 66.0 (b)	Pass
T4	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	81	-6920	15174	45.6 70.8 (b)	Pass
T5	80 - 60	Diagonal	L 3 x 3 x 3/16	101	-6937	20190	34.4 68.7 (b)	Pass
T6	60 - 40	Diagonal	L 3 x 3 x 3/16	122	-7375	15880	46.4 70.7 (b)	Pass
T7	40 - 20	Diagonal	L 3.5 x 3.5 x 1/4	143	-8006	22237	36.0 52.3 (b)	Pass
T8	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	158	-8491	18378	46.2 55.0 (b)	Pass
T1	150 - 140	Top Girt	L 3 x 3 x 1/4	5	-629	31504	2.0 6.8 (b)	Pass
							Summary	
						Leg (T4)	71.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
						Diagonal (T4)	70.8	Pass
						Top Girt (T1)	6.8	Pass
						Bolt Checks	70.8	Pass
						Rating =	71.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	62.9	Pass
1	Base Foundation (Soil Interaction)	0	60.2	Pass

Structure Rating (max from all components) =	71.6%

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

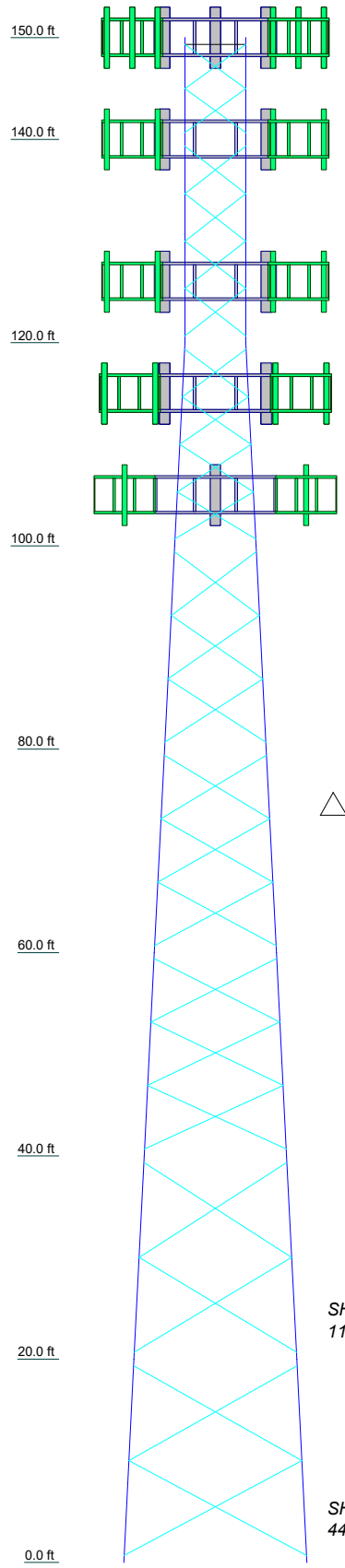
4.1) Recommendations

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	T1	T2	T3	T4	T5	T6	T7	T8
Legs		Pipe 2.875" x 0.203" (2.5 STD)	Pipe 4.5" x 0.237" (4 STD)	Pipe 5.563" x 0.258" (5 STD)	Pipe 6.625" x 0.280" (6 STD)	Pipe 8.625" x 0.322" (8 STD)	Pipe 8.625" x 0.50" (8 XS)	
Leg Grade	A500M-54							
Diagonals	A	L 2 x 2 x 3/16		L 2.5 x 2.5 x 3/16	L 3 x 3 x 3/16		L 3.5 x 3.5 x 1/4	
Diagonal Grade	A36							
Top Girts	L 3 x 3 x 1/4	N.A.						
Face Width (ft)	6	8 @ 4.66667		8	10	12	14	16
# Panels @ (ft)	2 @ 4.33333			9 @ 6.25			4 @ 9.33333	
Weight (lb) 17912.3	463.5	870.9	1254.8	1633.5	2184.8	2948.8	4212.4	4343.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L 1.5 x 1.5 x 3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 71.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 280217 lb
SHEAR: 27332 lb

UPLIFT: -244109 lb
SHEAR: 24740 lb

AXIAL 106532 lb
SHEAR 11441 lb *MOMENT 1054886 lb-ft*
TORQUE 6339 lb-ft
50 mph WIND - 1.000 in ICE

AXIAL 48604 lb
SHEAR 44262 lb *MOMENT 4115606 lb-ft*
TORQUE 16381 lb-ft
REACTIONS - 125 mph WIND

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: **150-ft Norwich, CT S/S Tower**			
Project: **PJF 13321-0008**			
Client: Everest Infrastructure Partners	Drawn by: Anna Trudo	App'd:	
Code: TIA-222-H	Date: 01/11/23	Scale: NTS	
Path: G:\TOWER\133_Everest Infrastructure Partners\2021\13321-0008_Norwich CDT\13321-0008.005.8700_VZW SA\tnx\13321-0008.005.8700.eri		Dwg No. E-1	

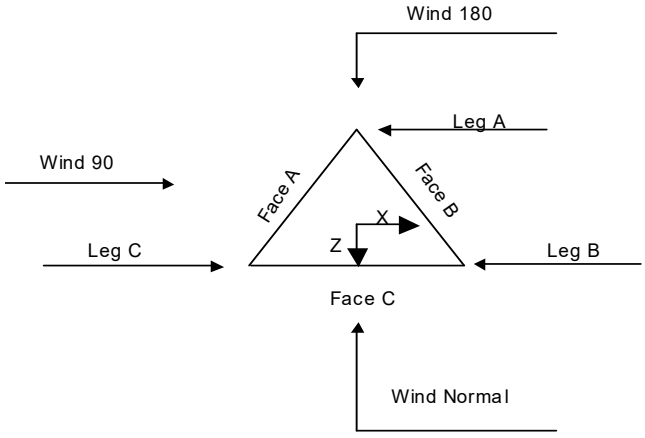
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.00 ft at the top and 18.00 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

- Tower is located in New London County, Connecticut.
- Tower base elevation above sea level: 292.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.000 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 tower member design is 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	150.00-140.00			6.00	1	10.00
T2	140.00-120.00			6.00	1	20.00
T3	120.00-100.00			6.00	1	20.00
T4	100.00-80.00			8.00	1	20.00
T5	80.00-60.00			10.00	1	20.00
T6	60.00-40.00			12.00	1	20.00
T7	40.00-20.00			14.00	1	20.00
T8	20.00-0.00			16.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	150.00-140.00	4.33	X Brace	No	No	8.000	8.000
T2	140.00-120.00	4.67	X Brace	No	No	8.000	8.000
T3	120.00-100.00	4.67	X Brace	No	No	8.000	8.000
T4	100.00-80.00	6.25	X Brace	No	No	7.500	7.500
T5	80.00-60.00	6.25	X Brace	No	No	7.500	7.500
T6	60.00-40.00	6.25	X Brace	No	No	7.500	7.500
T7	40.00-20.00	9.33	X Brace	No	No	8.000	8.000
T8	20.00-0.00	9.33	X Brace	No	No	8.000	8.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 150.00-140.00	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A500M-54 (54 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 140.00-120.00	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A500M-54 (54 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	Pipe 4.5" x 0.237" (4 STD)	A500M-54 (54 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T4 100.00-80.00	Pipe	Pipe 5.563" x 0.258" (5 STD)	A500M-54 (54 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T5 80.00-60.00	Pipe	Pipe 6.625" x 0.280" (6 STD)	A500M-54 (54 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T6 60.00-40.00	Pipe	Pipe 8.625" x 0.322" (8 STD)	A500M-54 (54 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T7 40.00-20.00	Pipe	Pipe 8.625" x 0.50" (8 XS)	A500M-54 (54 ksi)	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)
T8 20.00-0.00	Pipe	Pipe 8.625" x 0.50" (8 XS)	A500M-54 (54 ksi)	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T1 150.00-140.00	Single Angle	L 3 x 3 x 1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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*
T1 150.00-140.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T2 140.00-120.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T3 120.00-100.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T4 100.00-80.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T5 80.00-60.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T6 60.00-40.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T7 40.00-20.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T8 20.00-0.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 150.00-140.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 140.00-120.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 120.00-100.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 100.00-80.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 80.00-60.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 60.00-40.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 40.00-20.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 20.00-0.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal Net Width Deduct in	U	Redundant Diagonal Net Width Deduct in	U	Redundant Sub-Diagonal Net Width Deduct in	U	Redundant Sub-Horizontal Net Width Deduct in	U	Redundant Vertical Net Width Deduct in	U	Redundant Hip Net Width Deduct in	U	Redundant Hip Diagonal Net Width Deduct in	U
T1 150.00-140.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 140.00-120.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 120.00-100.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 100.00-80.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T5 80.00-60.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 60.00-40.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 40.00-20.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 20.00-0.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-140.00	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T2 140.00-120.00	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T3 120.00-100.00	Flange	1.000 A325N	6	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T4 100.00-80.00	Flange	1.000 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T5 80.00-60.00	Flange	1.250 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T6 60.00-40.00	Flange	1.250 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T7 40.00-20.00	Flange	1.250 A325N	8	0.750 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T8 20.00-0.00	Flange	1.500 A325N	0	0.750 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.5	1	1	0.375	0.375		0.22
1.5" flat Cable Ladder Rail	C	No	No	Af (CaAa)	150.00 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80
LDF7-50A(1-5/8")	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.25	6	6	1.980	1.980		0.82
AVA6-50(1-1/4") **	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.25	3	3	1.560	1.560		0.45
1.5" flat Cable Ladder Rail	A	No	No	Af (CaAa)	140.00 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80
AVA6-50(1-1/4") **	A	No	No	Ar (CaAa)	140.00 - 0.00	0.000	-0.25	4	4	1.560	1.560		0.45
1.5" flat Cable Ladder Rail	B	No	No	Af (CaAa)	127.50 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8") **	B	No	No	Ar (CaAa)	127.50 - 0.00	0.000	-0.25	13	13	1.000 1.980	1.980		0.82
1.5" flat Cable Ladder Rail	C	No	No	Af (CaAa)	115.00 - 0.00	0.000	0.25	2	2	30.000 1.500	1.500		1.80
AVA6-50(1-1/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	6	6	1.560	1.560		0.45
DC (3/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	2	2	1.090	0.750		0.33
DC (3/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	6	6	1.090	0.001		0.33
Fiber (3/8")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	2	1	1.090	0.001		0.33
3" (Nominal) Conduit **	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	1	1	3.500	3.500		1.49
HB158-21U6S12-XXXM-01(1-5/8)	A	No	No	Ar (CaAa)	105.00 - 0.00	0.000	-0.2	1	1	1.990	1.990		1.90

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 lb
T1	150.00-140.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	21.935	0.000	101
T2	140.00-120.00	A	0.000	0.000	22.480	0.000	108
		B	0.000	0.000	23.055	0.000	107
		C	0.000	0.000	43.870	0.000	202
T3	120.00-100.00	A	0.000	0.000	23.475	0.000	118
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	72.922	0.000	368
T4	100.00-80.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	82.606	0.000	424
T5	80.00-60.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	82.606	0.000	424
T6	60.00-40.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	82.606	0.000	424
T7	40.00-20.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	82.606	0.000	424
T8	20.00-0.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	61.480	0.000	285
		C	0.000	0.000	82.606	0.000	424

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 lb
T1	150.00-140.00	A	1.160	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	56.478	0.000	650
T2	140.00-120.00	A	1.147	0.000	0.000	53.587	0.000	604

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 lb
		B		0.000	0.000	44.936	0.000	547
		C		0.000	0.000	112.651	0.000	1288
T3	120.00-100.00	A	1.128	0.000	0.000	55.440	0.000	626
		B		0.000	0.000	119.572	0.000	1442
		C		0.000	0.000	205.521	0.000	2226
T4	100.00-80.00	A	1.106	0.000	0.000	61.401	0.000	707
		B		0.000	0.000	119.270	0.000	1422
		C		0.000	0.000	235.240	0.000	2500
T5	80.00-60.00	A	1.078	0.000	0.000	60.902	0.000	691
		B		0.000	0.000	118.900	0.000	1398
		C		0.000	0.000	233.537	0.000	2448
T6	60.00-40.00	A	1.042	0.000	0.000	60.254	0.000	672
		B		0.000	0.000	118.419	0.000	1367
		C		0.000	0.000	231.325	0.000	2380
T7	40.00-20.00	A	0.991	0.000	0.000	59.312	0.000	643
		B		0.000	0.000	117.719	0.000	1322
		C		0.000	0.000	228.110	0.000	2283
T8	20.00-0.00	A	0.887	0.000	0.000	57.444	0.000	589
		B		0.000	0.000	116.332	0.000	1234
		C		0.000	0.000	207.174	0.000	1947

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150.00-140.00	6.944	3.692	9.543	5.543
T2	140.00-120.00	2.655	-1.738	4.885	0.085
T3	120.00-100.00	0.270	-5.848	-0.185	-2.488
T4	100.00-80.00	-1.114	-6.085	-2.225	-1.896
T5	80.00-60.00	-1.236	-6.667	-2.510	-2.252
T6	60.00-40.00	-1.376	-7.338	-2.755	-2.643
T7	40.00-20.00	-1.589	-8.423	-3.110	-3.330
T8	20.00-0.00	-1.739	-9.189	-4.758	-4.277

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Safety Line 3/8	140.00 - 150.00	0.6000	0.6000
T1	2	1.5" flat Cable Ladder Rail	140.00 - 150.00	0.6000	0.6000
T1	3	LDF7-50A(1-5/8")	140.00 - 150.00	0.6000	0.6000
T1	4	AVA6-50(1-1/4")	140.00 - 150.00	0.6000	0.6000
T2	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T2	2	1.5" flat Cable Ladder Rail	120.00 - 140.00	0.6000	0.6000
T2	3	LDF7-50A(1-5/8")	120.00 - 140.00	0.6000	0.6000
T2	4	AVA6-50(1-1/4")	120.00 - 140.00	0.6000	0.6000
T2	6	1.5" flat Cable Ladder Rail	120.00 - 140.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T2	7	AVA6-50(1-1/4")	120.00 - 140.00	0.6000	0.6000
T2	9	1.5" flat Cable Ladder Rail	120.00 - 127.50	0.6000	0.6000
T2	10	LDF7-50A(1-5/8")	120.00 - 127.50	0.6000	0.6000
T3	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T3	2	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	3	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T3	4	AVA6-50(1-1/4")	100.00 - 120.00	0.6000	0.6000
T3	6	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	7	AVA6-50(1-1/4")	100.00 - 120.00	0.6000	0.6000
T3	9	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	10	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T3	13	1.5" flat Cable Ladder Rail	100.00 - 115.00	0.6000	0.6000
T3	14	AVA6-50(1-1/4")	100.00 - 115.00	0.6000	0.6000
T3	15	DC (3/4")	100.00 - 115.00	0.6000	0.6000
T3	16	DC (3/4")	100.00 - 115.00	0.6000	0.6000
T3	17	Fiber (3/8")	100.00 - 115.00	0.6000	0.6000
T3	18	3" (Nominal) Conduit	100.00 - 115.00	0.6000	0.6000
T3	20	HB158-21U6S12-XXXM-01(1-5/8)	100.00 - 105.00	0.6000	0.6000
T4	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T4	2	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	3	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T4	4	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	6	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	7	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	9	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	10	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T4	13	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	14	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	15	DC (3/4")	80.00 - 100.00	0.6000	0.6000
T4	16	DC (3/4")	80.00 - 100.00	0.6000	0.6000
T4	17	Fiber (3/8")	80.00 - 100.00	0.6000	0.6000
T4	18	3" (Nominal) Conduit	80.00 - 100.00	0.6000	0.6000
T4	20	HB158-21U6S12-XXXM-01(1-5/8)	80.00 - 100.00	0.6000	0.6000
T5	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T5	2	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	3	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T5	4	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	6	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	7	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	9	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	10	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T5	13	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	14	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	15	DC (3/4")	60.00 - 80.00	0.6000	0.6000
T5	16	DC (3/4")	60.00 - 80.00	0.6000	0.6000
T5	17	Fiber (3/8")	60.00 - 80.00	0.6000	0.6000
T5	18	3" (Nominal) Conduit	60.00 - 80.00	0.6000	0.6000
T5	20	HB158-21U6S12-XXXM-01(1-5/8)	60.00 - 80.00	0.6000	0.6000
T6	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T6	2	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	3	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T6	4	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	6	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	7	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	9	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	10	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T6	13	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	14	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	15	DC (3/4")	40.00 - 60.00	0.6000	0.6000
T6	16	DC (3/4")	40.00 - 60.00	0.6000	0.6000
T6	17	Fiber (3/8")	40.00 - 60.00	0.6000	0.6000
T6	18	3" (Nominal) Conduit	40.00 - 60.00	0.6000	0.6000
T6	20	HB158-21U6S12-XXXM-01(1-5/8)	40.00 - 60.00	0.6000	0.6000
T7	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T7	2	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	3	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T7	4	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	6	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T7	7	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	9	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	10	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T7	13	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	14	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	15	DC (3/4")	20.00 - 40.00	0.6000	0.6000
T7	16	DC (3/4")	20.00 - 40.00	0.6000	0.6000
T7	17	Fiber (3/8")	20.00 - 40.00	0.6000	0.6000
T7	18	3" (Nominal) Conduit	20.00 - 40.00	0.6000	0.6000
T7	20	HB158-21U6S12-XXXM-01(1-5/8)	20.00 - 40.00	0.6000	0.6000
T8	1	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T8	2	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	3	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T8	4	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	6	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	7	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	9	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	10	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T8	13	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	14	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	15	DC (3/4")	0.00 - 20.00	0.6000	0.6000
T8	16	DC (3/4")	0.00 - 20.00	0.6000	0.6000
T8	17	Fiber (3/8")	0.00 - 20.00	0.6000	0.6000
T8	18	3" (Nominal) Conduit	0.00 - 20.00	0.6000	0.6000
T8	20	HB158-21U6S12-XXXM-01(1-5/8)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *lb*
Site Pro 1 VFA12-HD	A	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	B	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	C	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
8' x 2" Sch 40 Pipe Mount	A	From Leg	4.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	29 44 63
8' x 2" Sch 40 Pipe Mount	B	From Leg	4.00	0.000	150.00	No Ice	1.90	1.90	29

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0			1/2"	2.73	2.73	44
			0			Ice	3.40	3.40	63
						1" Ice			
8' x 2" Sch 40 Pipe Mount	C	From Leg	4.00	0.000	150.00	No Ice	1.90	1.90	29
			0			1/2"	2.73	2.73	44
			0			Ice	3.40	3.40	63
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
RRUS 4415 B25	A	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RRUS 4415 B25	B	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RRUS 4415 B25	C	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0			1/2"	2.15	1.75	93
			0			Ice	2.33	1.92	116
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0			1/2"	2.15	1.75	93
			0			Ice	2.33	1.92	116
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0				2.15	1.75	93

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0			1/2" Ice	2.33	1.92	116
						1" Ice			
**									
Sector Mount [SM 802-3]	C	None		0.000	140.00	No Ice	25.34	25.34	930
						1/2" Ice	33.44	33.44	1388
						1" Ice	41.56	41.56	1977
DT465B-2XR_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
DT465B-2XR_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
DT465B-2XR_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
TD-RRH8x20-25	A	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
TD-RRH8x20-25	B	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
TD-RRH8x20-25	C	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
(2) 1900 MHz 4x45W RRH	A	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
(2) 1900 MHz 4x45W RRH	B	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
(2) 1900 MHz 4x45W RRH	C	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
APXV9ERR18-C-A20_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
APXV9ERR18-C-A20_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
APXV9ERR18-C-A20_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
(2) RRH2X50-800	A	From Leg	4.00 0 0	0.000	140.00	No Ice	1.70	1.28	53
						1/2" Ice	1.86	1.43	70
						1" Ice	2.03	1.58	90
(2) RRH2X50-800	B	From Leg	4.00 0 0	0.000	140.00	No Ice	1.70	1.28	53
						1/2" Ice	1.86	1.43	70
						1" Ice	2.03	1.58	90
(2) RRH2X50-800	C	From Leg	4.00	0.000	140.00	No Ice	1.70	1.28	53

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0 0			1/2" Ice 1" Ice	1.86 2.03	1.43 1.58	70 90
**									
Sector Mount [SM 802-3]	C	None		0.000	126.00	No Ice 1/2" Ice 1" Ice	25.34 33.44 41.56	25.34 33.44 41.56	930 1388 1977
BSAMNT-SBS-2-2 (Mount Bracket)	A	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	67 88 108
BSAMNT-SBS-2-2 (Mount Bracket)	B	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	67 88 108
BSAMNT-SBS-2-2 (Mount Bracket)	C	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	67 88 108
Miscellaneous [NA 509-1]	A	From Leg	2.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	6.32 7.79 9.36	4.85 6.36 7.94	275 417 598
Miscellaneous [NA 509-1]	B	From Leg	2.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	6.32 7.79 9.36	4.85 6.36 7.94	275 417 598
Miscellaneous [NA 509-1]	C	From Leg	2.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	6.32 7.79 9.36	4.85 6.36 7.94	275 417 598
12.5' x 2.375" Pipe (Hoirz)	A	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	2.97 4.25 5.54	1.07 1.54 2.01	30 52 83
12.5' x 2.375" Pipe (Hoirz)	B	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	2.97 4.25 5.54	1.07 1.54 2.01	30 52 83
12.5' x 2.375" Pipe (Hoirz)	C	From Leg	4.00 0 0	0.000	126.00	No Ice 1/2" Ice 1" Ice	2.97 4.25 5.54	1.07 1.54 2.01	30 52 83
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	96 136 180
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	96 136 180
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	96 136 180
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	89 165 250
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	89 165 250

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		*C_AA_A Front*	*C_AA_A Side*	*Weight*
			ft	°	*ft*		*ft^2*	*ft^2*	*lb*
			ft						
			ft						
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	126.00	No Ice	9.35	7.65	89
			0			1/2" Ice	9.92	8.83	165
			2			1" Ice	10.46	9.73	250
(2) APL868013_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	126.00	No Ice	3.10	4.80	30
			0			1/2" Ice	3.48	5.42	69
			2			1" Ice	3.85	6.04	113
(2) APL868013_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	126.00	No Ice	3.10	4.80	30
			0			1/2" Ice	3.48	5.42	69
			2			1" Ice	3.85	6.04	113
(2) APL868013_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	126.00	No Ice	3.10	4.80	30
			0			1/2" Ice	3.48	5.42	69
			2			1" Ice	3.85	6.04	113
B2/B66A RRH-BR049	A	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
B2/B66A RRH-BR049	B	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
B2/B66A RRH-BR049	C	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
B5/B13 RRH-BR04C	A	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
B5/B13 RRH-BR04C	B	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
B5/B13 RRH-BR04C	C	From Leg	4.00	0.000	126.00	No Ice	1.88	1.01	70
			0			1/2" Ice	2.05	1.14	87
			2			1" Ice	2.22	1.28	106
CBC78T-DS-43-2X	A	From Leg	4.00	0.000	126.00	No Ice	0.37	0.51	21
			0			1/2" Ice	0.45	0.60	27
			2			1" Ice	0.53	0.70	35
CBC78T-DS-43-2X	B	From Leg	4.00	0.000	126.00	No Ice	0.37	0.51	21
			0			1/2" Ice	0.45	0.60	27
			2			1" Ice	0.53	0.70	35
CBC78T-DS-43-2X	C	From Leg	4.00	0.000	126.00	No Ice	0.37	0.51	21
			0			1/2" Ice	0.45	0.60	27
			2			1" Ice	0.53	0.70	35
RRFDC-3315-PF-48	A	From Leg	4.00	0.000	126.00	No Ice	3.36	2.19	32
			0			1/2" Ice	3.60	2.39	61
			2			1" Ice	3.84	2.61	93
DB-B1-6C-12AB-0Z	B	From Leg	4.00	0.000	126.00	No Ice	2.60	2.08	55
			0			1/2" Ice	2.81	2.27	78
			2			1" Ice	3.04	2.47	105
**									
Site Pro 1 VFA12-HD	A	From Leg	2.00	0.000	115.00	No Ice	13.20	9.20	658
			0			1/2" Ice	19.50	14.60	804
			0			1" Ice	25.80	19.50	1015

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Site Pro 1 VFA12-HD	B	From Leg	2.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	C	From Leg	2.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
7770_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
7770_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
7770_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
OPA-65R-LCUU-H8_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.00 13.69 14.38	9.56 11.03 12.49	103 198 303
OPA-65R-LCUU-H6_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	9.68 10.25 10.79	7.12 8.30 9.20	106 181 265
OPA-65R-LCUU-H6_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	9.68 10.25 10.79	7.12 8.30 9.20	106 181 265
EPBQ-654L8H8-L2_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	18.33 19.06 19.81	9.17 10.68 12.22	119 236 363
EPBQ-654L8H6-L2_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.47 14.09 14.66	6.64 7.83 8.75	110 201 300
EPBQ-654L8H6-L2_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.47 14.09 14.66	6.64 7.83 8.75	110 201 300
DMP65R-BU8D_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	138 260 392
DMP65R-BU6D_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	12.95 13.55 14.11	7.26 8.43 9.31	115 207 308
DMP65R-BU6D_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	12.95 13.55 14.11	7.26 8.43 9.31	115 207 308
RRUS E2 B29	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	60 83 110
RRUS E2 B29	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	60 83 110
RRUS E2 B29	C	From Leg	4.00	0.000	115.00	No Ice	3.15	1.29	60

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *lb*
			0			1/2" Ice	3.36	1.44	83
			0			1" Ice	3.59	1.60	110
RRUS 4449 B5/B12	A	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	73
			0			1/2" Ice	2.14	1.56	92
			0			1" Ice	2.33	1.73	113
RRUS 4449 B5/B12	B	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	73
			0			1/2" Ice	2.14	1.56	92
			0			1" Ice	2.33	1.73	113
RRUS 4449 B5/B12	C	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	73
			0			1/2" Ice	2.14	1.56	92
			0			1" Ice	2.33	1.73	113
RRUS 4478 B14	A	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 4478 B14	B	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 4478 B14	C	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 32 B66A	A	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B66A	B	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B66A	C	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B30	A	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B30	B	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B30	C	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B2	A	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B2	B	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B2	C	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
(2) DC6-48-60-18-8F	A	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0				1.89	1.89	55

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		*C_AA_A Front*	*C_AA_A Side*	*Weight*
			ft	*°*	*ft*		*ft^2*	*ft^2*	*lb*
			ft						
			0			1/2" Ice	2.11	2.11	80
						1" Ice			
DC6-48-60-18-8F	B	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0			1/2" Ice	1.89	1.89	55
			0			1" Ice	2.11	2.11	80
DC6-48-60-18-8F	C	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0			1/2" Ice	1.89	1.89	55
			0			1" Ice	2.11	2.11	80
(2) LGP21401	A	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
(2) LGP21401	B	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
(2) LGP21401	C	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
**									
TA08025-B604	A	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	64
			0			1/2" Ice	2.14	1.11	81
			0			1" Ice	2.32	1.25	100
TA08025-B605	A	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	75
			0			1/2" Ice	2.14	1.27	93
			0			1" Ice	2.32	1.41	114
RDIDC-9181-PF-48	A	From Leg	4.00	0.000	105.00	No Ice	2.01	1.17	22
			0			1/2" Ice	2.19	1.31	40
			0			1" Ice	2.37	1.46	60
TA08025-B604	B	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	64
			0			1/2" Ice	2.14	1.11	81
			0			1" Ice	2.32	1.25	100
TA08025-B605	B	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	75
			0			1/2" Ice	2.14	1.27	93
			0			1" Ice	2.32	1.41	114
TA08025-B604	C	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	64
			0			1/2" Ice	2.14	1.11	81
			0			1" Ice	2.32	1.25	100
TA08025-B605	C	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	75
			0			1/2" Ice	2.14	1.27	93
			0			1" Ice	2.32	1.41	114
MX08FRO665-21_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	105.00	No Ice	12.73	7.53	108
			0			1/2" Ice	13.33	8.72	200
			0			1" Ice	13.89	9.62	301
MX08FRO665-21_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	105.00	No Ice	12.73	7.53	108
			0			1/2" Ice	13.33	8.72	200
			0			1" Ice	13.89	9.62	301
MX08FRO665-21_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	105.00	No Ice	12.73	7.53	108
			0			1/2" Ice	13.33	8.72	200
			0			1" Ice	13.89	9.62	301

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Sabre_C10837002C-32788_Sector_(3) **	A	None		0.000	105.00	No Ice 1/2" Ice 1" Ice	18.52 28.00 37.48	18.52 28.00 37.48	2028 3067 4106

Load Combinations

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

Comb. No.	Description
50	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	280217	23659	-13685
	Max. H_x	18	280217	23659	-13685
	Max. H_z	7	-244109	-21413	12392
	Min. Vert	7	-244109	-21413	12392
	Min. H_x	7	-244109	-21413	12392
	Min. H_z	18	280217	23659	-13685
Leg B	Max. Vert	10	271430	-22840	-12892
	Max. H_x	23	-235496	20576	11577
	Max. H_z	23	-235496	20576	11577
	Min. Vert	23	-235496	20576	11577
	Min. H_x	10	271430	-22840	-12892
	Min. H_z	10	271430	-22840	-12892
Leg A	Max. Vert	2	277284	-21	26894
	Max. H_x	21	12095	3145	812
	Max. H_z	2	277284	-21	26894
	Min. Vert	15	-241622	20	-24298
	Min. H_x	9	12005	-3147	805
	Min. H_z	15	-241622	20	-24298

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	40503	0	0	1785	710	0
1.2 Dead+1.0 Wind 0 deg - No Ice	48604	-5	-43458	-4069877	1543	-625
0.9 Dead+1.0 Wind 0 deg - No Ice	36453	-5	-43458	-4064216	1332	-627
1.2 Dead+1.0 Wind 30 deg - No Ice	48604	21535	-37451	-3504465	-2013577	7595
0.9 Dead+1.0 Wind 30 deg - No Ice	36453	21535	-37451	-3499676	-2010725	7592
1.2 Dead+1.0 Wind 60 deg - No Ice	48604	36903	-21386	-2005930	-3461066	-639
0.9 Dead+1.0 Wind 60 deg - No Ice	36453	36903	-21386	-2003413	-3456008	-642
1.2 Dead+1.0 Wind 90 deg - No Ice	48604	39300	5	2814	-3745485	-14170
0.9 Dead+1.0 Wind 90 deg - No Ice	36453	39300	5	2275	-3739926	-14172
1.2 Dead+1.0 Wind 120 deg - No Ice	48604	36584	21209	1998916	-3440036	8164
0.9 Dead+1.0 Wind 120 deg - No Ice	36453	36584	21209	1995326	-3434988	8163
1.2 Dead+1.0 Wind 150 deg - No Ice	48604	19846	34514	3312942	-1901260	16380
0.9 Dead+1.0 Wind 150 deg - No Ice	36453	19846	34514	3307278	-1898526	16381
1.2 Dead+1.0 Wind 180 deg - No Ice	48604	5	41848	3962533	133	625
0.9 Dead+1.0 Wind 180 deg - No Ice	36453	5	41848	3955928	-75	627
1.2 Dead+1.0 Wind 210 deg - No Ice	48604	-21535	37451	3508795	2015216	-7595

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.0 Wind 210 deg - No Ice	36453	-21535	37451	3502926	2011946	-7593
1.2 Dead+1.0 Wind 240 deg - No Ice	48604	-38297	22192	2066050	3559445	639
0.9 Dead+1.0 Wind 240 deg - No Ice	36453	-38297	22192	2062388	3553849	641
1.2 Dead+1.0 Wind 270 deg - No Ice	48604	-39300	-5	1403	3747175	14170
0.9 Dead+1.0 Wind 270 deg - No Ice	36453	-39300	-5	866	3741196	14172
1.2 Dead+1.0 Wind 300 deg - No Ice	48604	-35189	-20404	-1938770	3345050	-8163
0.9 Dead+1.0 Wind 300 deg - No Ice	36453	-35189	-20404	-1936326	3339700	-8162
1.2 Dead+1.0 Wind 330 deg - No Ice	48604	-19846	-34514	-3308608	1903009	-16380
0.9 Dead+1.0 Wind 330 deg - No Ice	36453	-19846	-34514	-3304023	1899853	-16380
1.2 Dead+1.0 Ice+1.0 Temp	106532	0	0	15881	1349	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	106532	-1	-11441	-1038535	1443	-739
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	106532	5603	-9722	-879501	-514486	2800
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	106532	9342	-5403	-484707	-864079	-436
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	106532	9928	1	16133	-934921	-1561
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	106532	8926	5164	500765	-836183	4462
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	106532	5257	9122	872075	-491849	6339
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	106532	1	11211	1054885	1196	739
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	106532	-5603	9722	911523	517121	-2800
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	106532	-9541	5518	524564	880295	435
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	106532	-9928	-1	15884	937561	1561
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	106532	-8726	-5048	-460898	825247	-4461
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	106532	-5257	-9122	-840052	494495	-6339
Dead+Wind 0 deg - Service	40503	-1	-10233	-945690	867	-144
Dead+Wind 30 deg - Service	40503	5072	-8820	-814183	-468061	1743
Dead+Wind 60 deg - Service	40503	8693	-5038	-465519	-804974	-151
Dead+Wind 90 deg - Service	40503	9275	1	1951	-871796	-3266
Dead+Wind 120 deg - Service	40503	8620	4997	466493	-800133	1877
Dead+Wind 150 deg - Service	40503	4683	8143	772670	-442210	3768
Dead+Wind 180 deg - Service	40503	1	9862	923566	542	144
Dead+Wind 210 deg - Service	40503	-5072	8820	817766	469469	-1743
Dead+Wind 240 deg - Service	40503	-9015	5223	481953	828646	151
Dead+Wind 270 deg - Service	40503	-9275	-1	1626	873206	3266
Dead+Wind 300 deg - Service	40503	-8299	-4811	-450058	779281	-1877
Dead+Wind 330 deg - Service	40503	-4683	-8143	-769087	443623	-3768

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0	-40503	0	0	40503	0	0.000%
2	-5	-48604	-43458	5	48604	43458	0.000%
3	-5	-36453	-43458	5	36453	43458	0.000%
4	21535	-48604	-37451	-21535	48604	37451	0.000%
5	21535	-36453	-37451	-21535	36453	37451	0.000%
6	36903	-48604	-21386	-36903	48604	21386	0.000%
7	36903	-36453	-21386	-36903	36453	21386	0.000%
8	39300	-48604	5	-39300	48604	-5	0.000%
9	39300	-36453	5	-39300	36453	-5	0.000%
10	36584	-48604	21209	-36584	48604	-21209	0.000%
11	36584	-36453	21209	-36584	36453	-21209	0.000%
12	19846	-48604	34514	-19846	48604	-34514	0.000%
13	19846	-36453	34514	-19846	36453	-34514	0.000%
14	5	-48604	41848	-5	48604	-41848	0.000%
15	5	-36453	41848	-5	36453	-41848	0.000%
16	-21535	-48604	37451	21535	48604	-37451	0.000%
17	-21535	-36453	37451	21535	36453	-37451	0.000%
18	-38297	-48604	22192	38297	48604	-22192	0.000%
19	-38297	-36453	22192	38297	36453	-22192	0.000%
20	-39300	-48604	-5	39300	48604	5	0.000%
21	-39300	-36453	-5	39300	36453	5	0.000%
22	-35189	-48604	-20404	35189	48604	20404	0.000%
23	-35189	-36453	-20404	35189	36453	20404	0.000%
24	-19846	-48604	-34514	19846	48604	34514	0.000%
25	-19846	-36453	-34514	19846	36453	34514	0.000%
26	0	-106532	0	0	106532	0	0.000%
27	-1	-106532	-11441	1	106532	11441	0.000%
28	5603	-106532	-9722	-5603	106532	9722	0.000%
29	9342	-106532	-5403	-9342	106532	5403	0.000%
30	9928	-106532	1	-9928	106532	-1	0.000%
31	8926	-106532	5164	-8926	106532	-5164	0.000%
32	5257	-106532	9122	-5257	106532	-9122	0.000%
33	1	-106532	11211	-1	106532	-11211	0.000%
34	-5603	-106532	9722	5603	106532	-9722	0.000%
35	-9541	-106532	5518	9541	106532	-5518	0.000%
36	-9928	-106532	-1	9928	106532	1	0.000%
37	-8726	-106532	-5048	8726	106532	5048	0.000%
38	-5257	-106532	-9122	5257	106532	9122	0.000%
39	-1	-40503	-10233	1	40503	10233	0.000%
40	5072	-40503	-8820	-5072	40503	8820	0.000%
41	8693	-40503	-5038	-8693	40503	5038	0.000%
42	9275	-40503	1	-9275	40503	-1	0.000%
43	8620	-40503	4997	-8620	40503	-4997	0.000%
44	4683	-40503	8143	-4683	40503	-8143	0.000%
45	1	-40503	9862	-1	40503	-9862	0.000%
46	-5072	-40503	8820	5072	40503	-8820	0.000%
47	-9015	-40503	5223	9015	40503	-5223	0.000%
48	-9275	-40503	-1	9275	40503	1	0.000%
49	-8299	-40503	-4811	8299	40503	4811	0.000%
50	-4683	-40503	-8143	4683	40503	8143	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	0.00000162
3	Yes	4	0.00000001	0.00000113
4	Yes	4	0.00000001	0.00000149
5	Yes	4	0.00000001	0.00000096
6	Yes	4	0.00000001	0.00000139
7	Yes	4	0.00000001	0.00000079
8	Yes	4	0.00000001	0.00000146
9	Yes	4	0.00000001	0.00000091
10	Yes	4	0.00000001	0.00000159
11	Yes	4	0.00000001	0.00000110
12	Yes	4	0.00000001	0.00000150
13	Yes	4	0.00000001	0.00000097
14	Yes	4	0.00000001	0.00000140
15	Yes	4	0.00000001	0.00000080
16	Yes	4	0.00000001	0.00000148
17	Yes	4	0.00000001	0.00000096
18	Yes	4	0.00000001	0.00000158
19	Yes	4	0.00000001	0.00000110
20	Yes	4	0.00000001	0.00000146
21	Yes	4	0.00000001	0.00000091
22	Yes	4	0.00000001	0.00000139
23	Yes	4	0.00000001	0.00000078
24	Yes	4	0.00000001	0.00000151
25	Yes	4	0.00000001	0.00000097
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000968
28	Yes	4	0.00000001	0.00000968
29	Yes	4	0.00000001	0.00000967
30	Yes	4	0.00000001	0.00000953
31	Yes	4	0.00000001	0.00000963
32	Yes	4	0.00000001	0.00000974
33	Yes	4	0.00000001	0.00000984
34	Yes	4	0.00000001	0.00000971
35	Yes	4	0.00000001	0.00000955
36	Yes	4	0.00000001	0.00000938
37	Yes	4	0.00000001	0.00000948
38	Yes	4	0.00000001	0.00000957
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 °
T1	150 - 140	3.60	47	0.234	0.018
T2	140 - 120	3.08	47	0.230	0.016
T3	120 - 100	2.12	47	0.191	0.015
T4	100 - 80	1.36	47	0.145	0.012
T5	80 - 60	0.81	47	0.100	0.008
T6	60 - 40	0.44	47	0.061	0.006
T7	40 - 20	0.20	47	0.035	0.003
T8	20 - 0	0.06	47	0.018	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Site Pro 1 VFA12-HD	47	3.60	0.234	0.018	105241
140.00	Sector Mount [SM 802-3]	47	3.08	0.230	0.016	53879
126.00	Sector Mount [SM 802-3]	47	2.39	0.205	0.016	26143
115.00	Site Pro 1 VFA12-HD	47	1.91	0.179	0.015	21958
105.00	TA08025-B604	47	1.53	0.156	0.013	22820

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	15.58	18	1.016	0.077
T2	140 - 120	13.33	18	1.001	0.071
T3	120 - 100	9.18	18	0.827	0.067
T4	100 - 80	5.88	18	0.626	0.052
T5	80 - 60	3.48	18	0.431	0.037
T6	60 - 40	1.87	18	0.265	0.025
T7	40 - 20	0.85	18	0.152	0.014
T8	20 - 0	0.27	18	0.076	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Site Pro 1 VFA12-HD	18	15.58	1.016	0.077	24448
140.00	Sector Mount [SM 802-3]	18	13.33	1.001	0.071	12512
126.00	Sector Mount [SM 802-3]	18	10.35	0.891	0.068	6039
115.00	Site Pro 1 VFA12-HD	18	8.27	0.775	0.064	5049
105.00	TA08025-B604	18	6.62	0.675	0.056	5245

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	150	Leg	A325N	0.750	4	1846	30101	0.061 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.500	1	2426	6986	0.347 ✔	1.05	Member Block Shear
		Top Girt	A325N	0.500	1	629	8836	0.071 ✔	1.05	Bolt Shear
T2	140	Leg	A325N	1.000	4	10966	54517	0.201 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6385	9788	0.652 ✔	1.05	Member Bearing
T3	120	Leg	A325N	1.000	6	14483	54517	0.266 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6779	9788	0.693 ✔	1.05	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T4	100	Leg	A325N	1.000	8	15862	54517	0.291 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7278	9788	0.744 ✔	1.05	Member Bearing
T5	80	Leg	A325N	1.250	8	20119	87220	0.231 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7058	9788	0.721 ✔	1.05	Member Bearing
T6	60	Leg	A325N	1.250	8	23957	87220	0.275 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7264	9788	0.742 ✔	1.05	Member Bearing
T7	40	Leg	A325N	1.250	8	27428	87220	0.314 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.750	1	7881	14355	0.549 ✔	1.05	Member Bearing
T8	20	Diagonal	A325N	0.750	1	8287	14355	0.577 ✔	1.05	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	Pipe 2.875" x 0.203" (2.5 STD)	10.00	4.33	54.9 K=1.00	1.704	-8288	65284	0.127 [1] ✔
T2	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	4.67	59.1 K=1.00	1.704	-45870	62849	0.730 [1] ✔
T3	120 - 100	Pipe 4.5" x 0.237" (4 STD)	20.03	4.67	37.2 K=1.00	3.174	-96504	138323	0.698 [1] ✔
T4	100 - 80	Pipe 5.563" x 0.258" (5 STD)	20.03	6.26	40.0 K=1.00	4.300	-138483	184163	0.752 [1] ✔
T5	80 - 60	Pipe 6.625" x 0.280" (6 STD)	20.03	6.26	33.5 K=1.00	5.581	-176573	248307	0.711 [1] ✔
T6	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.03	6.26	25.6 K=1.00	8.399	-211659	387660	0.546 [1] ✔
T7	40 - 20	Pipe 8.625" x 0.50" (8 XS)	20.03	9.35	39.0 K=1.00	12.763	-242205	550137	0.440 [1] ✔
T8	20 - 0	Pipe 8.625" x 0.50" (8 XS)	20.03	9.35	39.0 K=1.00	12.763	-272753	550137	0.496 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 1.5 x 1.5 x 3/16	7.40	3.42	139.8 K=1.00	0.527	-2339	7723	0.303 [1] ✔
T2	140 - 120	L 2 x 2 x 3/16	7.60	3.51	110.3 K=1.03	0.715	-6369	15901	0.401 [1] ✔
T3	120 - 100	L 2 x 2 x 3/16	9.00	4.28	130.5 K=1.00	0.715	-6751	12020	0.562 [1] ✔
T4	100 - 80	L 2.5 x 2.5 x 3/16	11.48	5.51	133.7 K=1.00	0.902	-6920	14452	0.479 [1] ✔
T5	80 - 60	L 3 x 3 x 3/16	13.20	6.33	127.4 K=1.00	1.090	-6937	19229	0.361 [1] ✔
T6	60 - 40	L 3 x 3 x 3/16	14.99	7.14	143.6 K=1.00	1.090	-7375	15124	0.488 [1] ✔
T7	40 - 20	L 3.5 x 3.5 x 1/4	18.07	8.74	151.1 K=1.00	1.690	-8006	21178	0.378 [1] ✔
T8	20 - 0	L 3.5 x 3.5 x 1/4	19.81	9.61	166.2 K=1.00	1.690	-8491	17503	0.485 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 3 x 3 x 1/4	6.00	5.49	115.6 K=1.04	1.438	-629	30004	0.021 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	Pipe 2.875" x 0.203" (2.5 STD)	10.00	0.67	8.4	1.704	7386	82817	0.089 [1] ✔
T2	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	0.67	8.4	1.704	43865	82817	0.530 [1] ✔
T3	120 - 100	Pipe 4.5" x 0.237" (4 STD)	20.03	0.67	5.3	3.174	86897	154259	0.563 [1] ✔
T4	100 - 80	Pipe 5.563" x 0.258" (5 STD)	20.03	0.63	4.0	4.300	126895	208974	0.607 [1] ✔
T5	80 - 60	Pipe 6.625" x 0.280" (6 STD)	20.03	0.63	3.3	5.581	160952	271254	0.593 [1] ✔
T6	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.03	0.63	2.6	8.399	191656	408204	0.470 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	40 - 20	Pipe 8.625" x 0.50" (8 XS)	20.03	0.67	2.8	12.763	219425	620268	0.354 [1] ✔
T8	20 - 0	Pipe 8.625" x 0.50" (8 XS)	20.03	0.67	2.8	12.763	245176	620268	0.395 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 1.5 x 1.5 x 3/16	7.40	3.42	93.4	0.308	2426	13381	0.181 [1] ✔
T2	140 - 120	L 2 x 2 x 3/16	7.60	3.51	71.0	0.431	6385	18739	0.341 [1] ✔
T3	120 - 100	L 2 x 2 x 3/16	9.00	4.28	86.0	0.431	6779	18739	0.362 [1] ✔
T4	100 - 80	L 2.5 x 2.5 x 3/16	10.45	5.01	79.3	0.571	7278	24840	0.293 [1] ✔
T5	80 - 60	L 3 x 3 x 3/16	12.11	5.79	75.7	0.712	7058	30968	0.228 [1] ✔
T6	60 - 40	L 3 x 3 x 3/16	13.86	6.58	85.7	0.712	7264	30968	0.235 [1] ✔
T7	40 - 20	L 3.5 x 3.5 x 1/4	18.07	8.74	97.8	1.103	7881	48000	0.164 [1] ✔
T8	20 - 0	L 3.5 x 3.5 x 1/4	19.81	9.61	107.4	1.103	8287	48000	0.173 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 3 x 3 x 1/4	6.00	5.49	74.3	0.961	605	41801	0.014 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	150 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-8288	68548	12.1	Pass

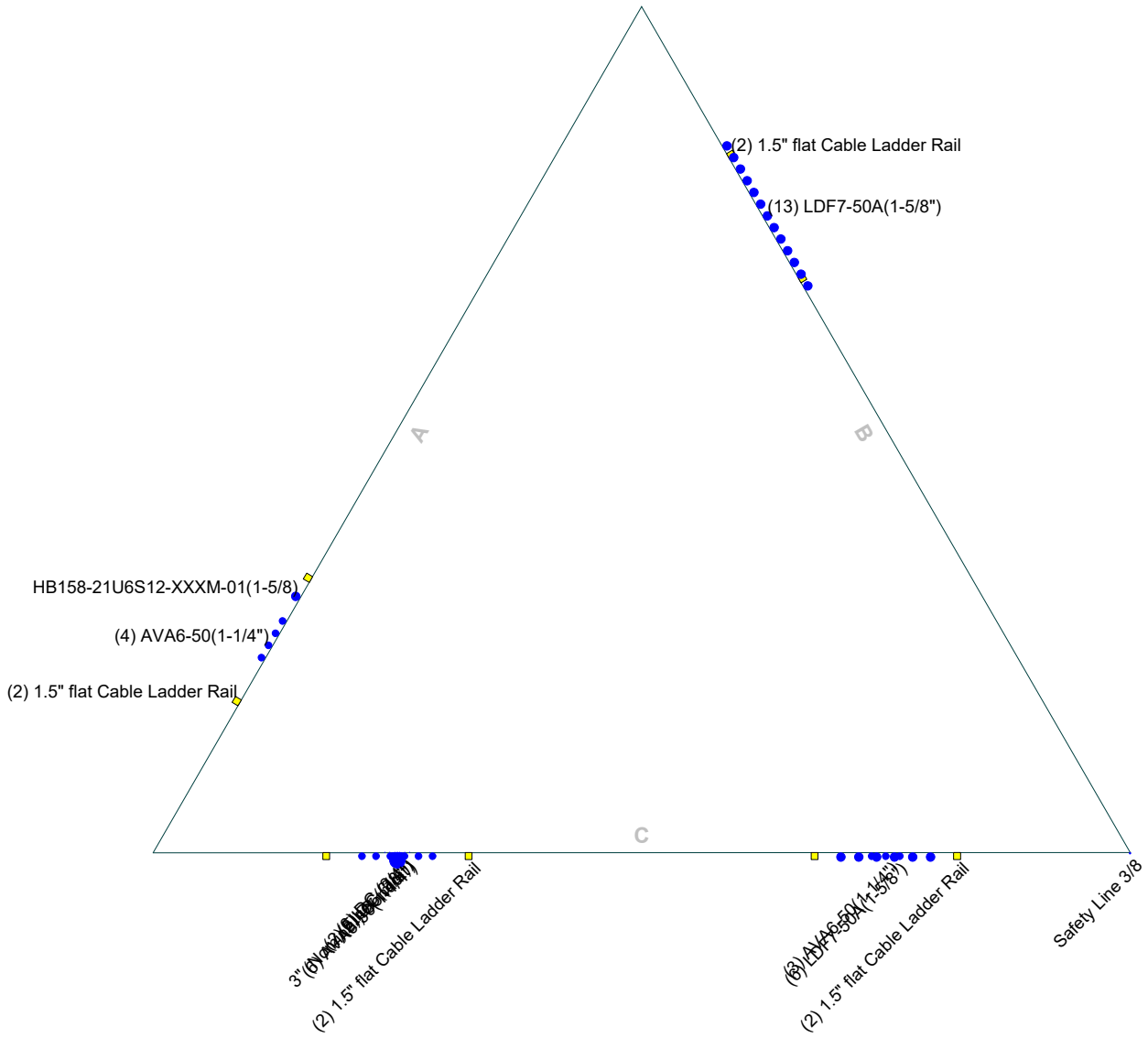
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T2	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	21	-45870	65992	69.5	Pass
T3	120 - 100	Leg	Pipe 4.5" x 0.237" (4 STD)	48	-96504	145239	66.4	Pass
T4	100 - 80	Leg	Pipe 5.563" x 0.258" (5 STD)	75	-138483	193371	71.6	Pass
T5	80 - 60	Leg	Pipe 6.625" x 0.280" (6 STD)	94	-176573	260722	67.7	Pass
T6	60 - 40	Leg	Pipe 8.625" x 0.322" (8 STD)	115	-211659	407043	52.0	Pass
T7	40 - 20	Leg	Pipe 8.625" x 0.50" (8 XS)	136	-242205	577644	41.9	Pass
T8	20 - 0	Leg	Pipe 8.625" x 0.50" (8 XS)	151	-272753	577644	47.2	Pass
T1	150 - 140	Diagonal	L 1.5 x 1.5 x 3/16	9	-2339	8110	28.8 33.1 (b)	Pass
T2	140 - 120	Diagonal	L 2 x 2 x 3/16	24	-6369	16696	38.1 62.1 (b)	Pass
T3	120 - 100	Diagonal	L 2 x 2 x 3/16	54	-6751	12621	53.5 66.0 (b)	Pass
T4	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	81	-6920	15174	45.6 70.8 (b)	Pass
T5	80 - 60	Diagonal	L 3 x 3 x 3/16	101	-6937	20190	34.4 68.7 (b)	Pass
T6	60 - 40	Diagonal	L 3 x 3 x 3/16	122	-7375	15880	46.4 70.7 (b)	Pass
T7	40 - 20	Diagonal	L 3.5 x 3.5 x 1/4	143	-8006	22237	36.0 52.3 (b)	Pass
T8	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	158	-8491	18378	46.2 55.0 (b)	Pass
T1	150 - 140	Top Girt	L 3 x 3 x 1/4	5	-629	31504	2.0 6.8 (b)	Pass
							Summary	
							Leg (T4) 71.6	Pass
							Diagonal (T4) 70.8	Pass
							Top Girt (T1) 6.8	Pass
							Bolt Checks 70.8	Pass
							RATING = 71.6	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: ***150-ft Norwich, CT S/S Tower***			
Project: ***PJF 13321-0008***			
Client: Everest Infrastructure Partners	Drawn by: Anna Trudo	App'd:	
Code: TIA-222-H	Date: 01/11/23	Scale: NTS	
Path: G:\TOWER\133_Everest Infrastructure Partners\2021\13321-0008_Norwich CDT\13321-0008.005.8700_VZW SA\tnx\13321-0008.005.8700.eri		Dwg No. E-7	

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By AKT Date 1/11/2023
Project # 13321-0008.005.8700

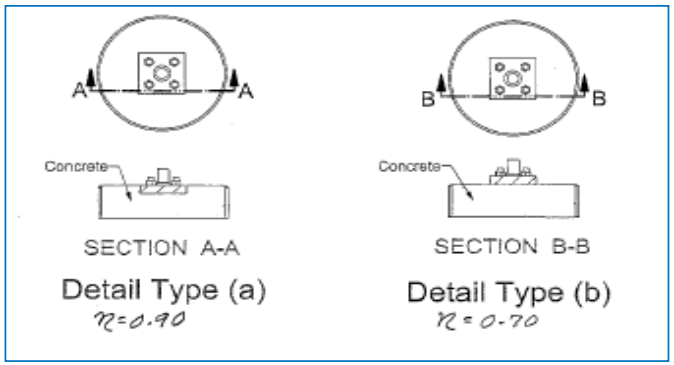
Self-Support Tower Anchor Rod Capacity - TIA-H

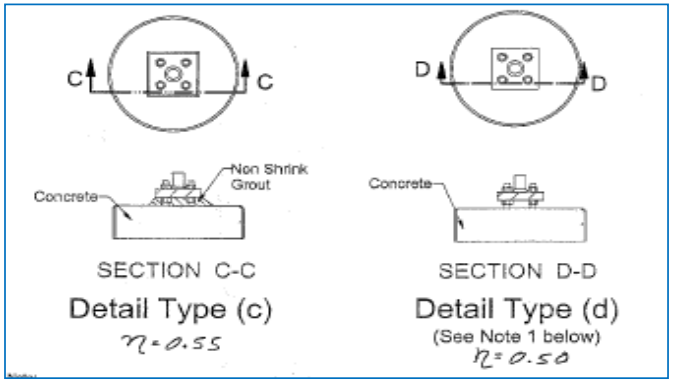
Loads

Compression :	280.2	kips	Tension :	244.1	kips	Code:	TIA-H
Comp. Shear :	27.3	kips	Ten.Shear :	24.7	kips	Maximum Ratio:	1.00
						Grout f'c ≥ 5000 psi:	

Existing Anchor Rods

Anchor Rod ø :	1 1/2	in	l_{ar} :	1.5	inches			
Anchor Rod Quantity :	8		Comp. M_u :	26.62	k-in	Ten. M_u :	24.08	k-in
Anchor Rod Grade :	F1554 Gr. 36		ϕ_c :	0.90				
F_y :	36	ksi	ϕ_v :	0.75				
F_u :	58	ksi	ϕ_f :	0.90				
Threads per Inch	6		$\phi_v R_{nv}$:	307.48	kips			
Net Tensile Area	1.41	in^2						
ϕ_t :	0.75		$\phi_f M_n$:	137.41	k-in			
$\phi_t R_{nt}$:	489.03	kip	$\phi_c R_{nc}$:	458.04	kips			
Anchor Rod Ratio :	0.629		$\phi_c R_{nvc}$:	206.12	kips			





PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Job Number: 13321-0008.005.8700
Site Number: 24530 / 15368507
Site Name: Norwich, CT
By: AKT
Date: 1/11/2023

Version 1.3a, Effective 07/03/2019

DRILLED PIER STEEL ANALYSIS - STEEL CALCULATIONS - TIA-222-H

BASED ON ACI 318-14, SECTION 10 (ASSUMING TIE REINFORCEMENT)

ROCK ANCHOR CHECK - TOWER COMPRESSION LEG

Factored Internal Loads from Analysis

Reference Standard =	TIA-222-H	
ACI Code =	ACI 318-14	
Maximum Ratio =	100.0%	
Axial Load, Pu =	280.2	kips, (+Comp, -Tension)
Moment, Mu =	117.4	k-ft (Must be Positive)
Depth to Analysis Section =	3.80	ft, from Grade

Factored Internal Loads

Load Factor =	1.0	
Axial Load, Pu = ΦPn =	280.2	kips
Moment, Mu =	117.4	k-ft

Drilled Pier Geometry and Concrete Specifications

Diameter =	42	in
fc' =	0.416	ksi
εc =	0.003	in/in
β1 =	0.85	
Ag =	1385.4	in^2
Height Above Grade =	0.5	ft
Depth Below Grade =	3.8	ft

Nominal Axial Load and Moment

ΦPn(max) =	488.4	kips
ΦPn(min) =	-406.4	kips
ΦPn =	280.2	kips
Φ =	0.650	
ΦMn (Resultant) =	203.4	k-ft
at θ =	180.00	degrees
NA Depth =	28.29	in

Rebar Size and Specifications

	Existing	Bar Circle 2	
Bar Size =	#10		
Override Bar Diameter =			in
Bar Diameter =	1.2700	0.0000	in
Bar Area =	1.2700	0.0000	in^2
Effective Bar Area =	1.2700	0.0000	in^2
Number Bars =	5		
Spacing =	Symmetric		
fy =	71.1111111		ksi
Es =	29000	29000	ksi
εy =	0.00245	0.00000	in/in
Tie Size =	#4		
Clear Cover to Ties =	6.865		in
Bar Circle =	26		in
Adjust =	18.0000		
% of Area Effective =	100.0%	100.0%	
Include in Calcs =	Yes	Yes	
Bar Circle Valid =	Yes	No	

AXIAL RATIO* = 54.6% OK

MOMENT RATIO* = 55.0% OK

*Rating per TIA-222-H Section 15.5

Minimum Required Steel

Seismic Design Category =	B		
As(min) =	6.93	sq in	TIA-222-H, 9.4.1
As =	6.35	sq in	
Stl Area Reduction Factor =	1.00		

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Job Number: 13321-0008.005.8700
Site Number: 24530 / 15368507
Site Name: Norwich, CT
By: AKT
Date: 1/11/2023

Version 1.3a, Effective 07/03/2019

DRILLED PIER STEEL ANALYSIS - STEEL CALCULATIONS - TIA-222-H

BASED ON ACI 318-14, SECTION 10 (ASSUMING TIE REINFORCEMENT)

ROCK ANCHOR CHECK - TOWER UPLIFT LEG

Factored Internal Loads from Analysis

Reference Standard =	TIA-222-H	
ACI Code =	ACI 318-14	
Maximum Ratio =	100.0%	
Axial Load, Pu =	-244.1	kips, (+Comp, -Tension)
Moment, Mu =	106.2	k-ft (Must be Positive)
Depth to Analysis Section =	3.80	ft, from Grade

Factored Internal Loads

Load Factor =	1.0	
Axial Load, Pu = ΦPn =	-244.1	kips
Moment, Mu =	106.2	k-ft

Drilled Pier Geometry and Concrete Specifications

Diameter =	42	in
fc' =	0.416	ksi
εc =	0.003	in/in
β1 =	0.85	
Ag =	1385.4	in^2
Height Above Grade =	0.5	ft
Depth Below Grade =	3.8	ft

Nominal Axial Load and Moment

ΦPn(max) =	488.4	kips
ΦPn(min) =	-406.4	kips
ΦPn =	-244.1	kips
Φ =	0.900	
ΦMn (Resultant) =	168.1	k-ft
at θ =	0.00	degrees
NA Depth =	8.38	in

Rebar Size and Specifications

	Existing	Bar Circle 2	
Bar Size =	#10		
Override Bar Diameter =			in
Bar Diameter =	1.2700	0.0000	in
Bar Area =	1.2700	0.0000	in^2
Effective Bar Area =	1.2700	0.0000	in^2
Number Bars =	5		
Spacing =	Symmetric		
fy =	71.1111111		ksi
Es =	29000	29000	ksi
εy =	0.00245	0.00000	in/in
Tie Size =	#4		
Clear Cover to Ties =	6.865		in
Bar Circle =	26		in
Adjust =	18.0000		
% of Area Effective =	100.0%	100.0%	
Include in Calcs =	Yes	Yes	
Bar Circle Valid =	Yes	No	

AXIAL RATIO* = **57.2%** **OK**

MOMENT RATIO* = **60.2%** **OK**

*Rating per TIA-222-H Section 15.5

Minimum Required Steel

Seismic Design Category =	B		
As(min) =	6.93	sq in	TIA-222-H, 9.4.1
As =	6.35	sq in	
Stl Area Reduction Factor =	1.00		

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) The structural integrity of the existing tower foundation can only be verified if exact foundation sizes and soil conditions are known. Paul J. Ford and Company will not accept any responsibility for the adequacy of the existing foundations unless the foundation sizes and a soils report are provided.

5) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-H. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

6) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

7) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

NORWICH EAST

2 Hinckley Hill Road, Preston, CT 06365

February 23, 2023

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of Verizon's antenna arrays to be mounted at 127.5' AGL on an existing self-support lattice tower located at 2 Hinckley Hill Road in Preston, CT. The coordinates of the monopole tower are 41° 30' 53.4528" N, 72° 3' 42.0768" W.

Verizon is proposing the following:

1) Install three (3) multi-band antennas (one (1) per sector) to support its commercial LTE network.

This report considers the planned antenna configuration for Verizon[1] to derive the resulting % MPE of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment C contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to Verizon's Radio Frequency Design Sheet updated 11/09/2021.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{PowerDensity} = \left(\frac{EIRP}{\pi \times R^2} \right) \times \text{Off BeamLoss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor of 1.6

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines Verizon's proposed antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachments C.

Operator	Sector / Call Sign	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha / 30°	700	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	127.5
		850	160	15.8	6083		65			
		1900	160	18.4	11069		65			
		2100	240	18.5	16990		68			
		3700	200	23.35	43254	MT6407-77A	-	0	2.92	127.5
	Beta / 135°	700	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	127.5
		850	160	15.8	6083		65			
		1900	160	18.4	11069		65			
		2100	240	18.5	16990		68			
		3700	200	23.35	43254	MT6407-77A	-	0	2.92	127.5
	Gamma / 260°	700	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	127.5
		850	160	15.8	6083		65			
		1900	160	18.4	11069		65			
		2100	240	18.5	16990		68			
		3700	200	23.35	43254	MT6407-77A	-	0	2.92	127.5

Table 1: Proposed Antenna Inventory[2] [3]

[2] Antenna heights are in reference to Verizon's Radio Frequency Design Sheet updated 11/09/2021.

[3] Transmit power assumes 0 dB of cable loss.

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

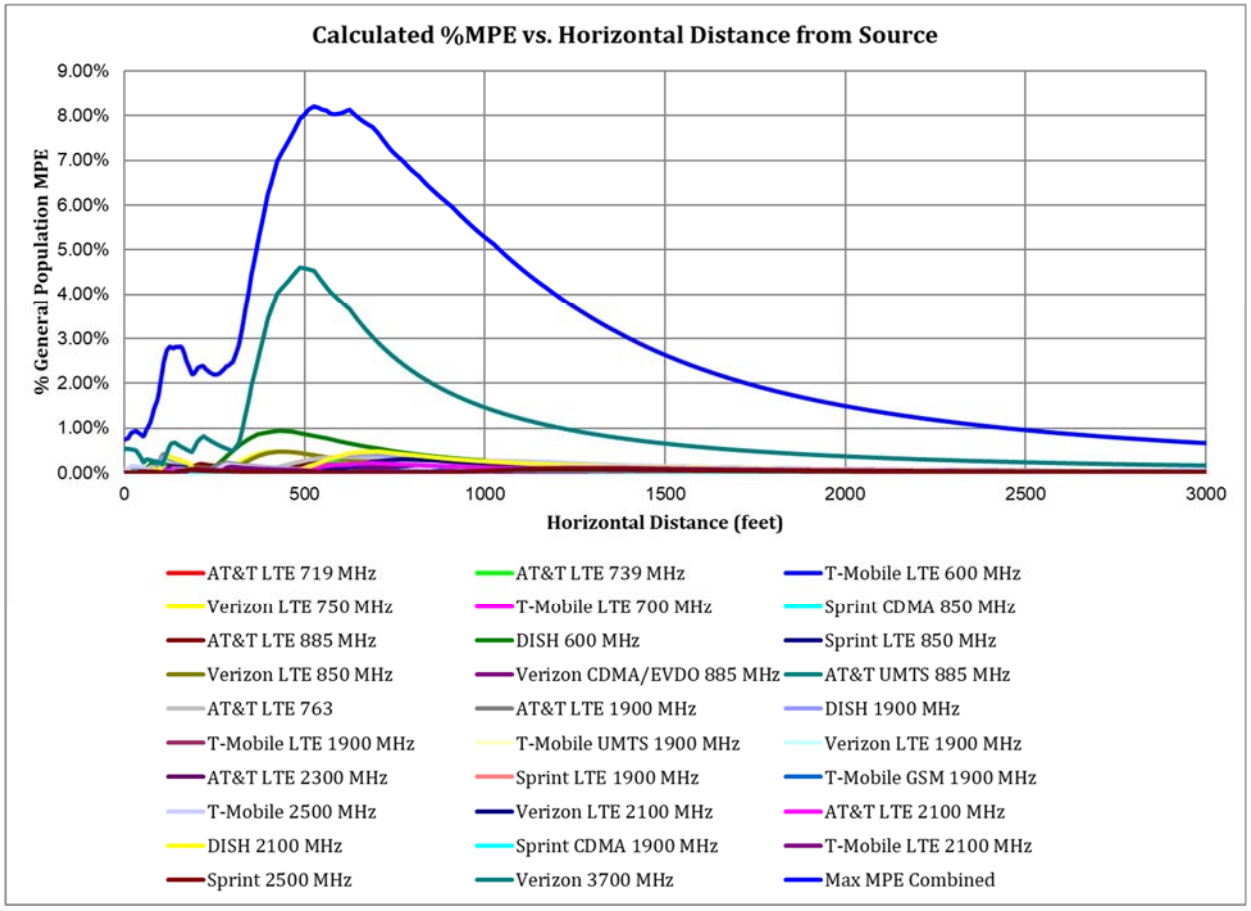


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (8.21**%** of the General Population limit) is calculated to occur at a horizontal distance of 526 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 526 feet from the site (reference Figure 1).

As stated in Section 3, all calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T LTE 1900 MHz	1	160.0	115.0	526	0.000736	1.000	0.07%
AT&T LTE 2100 MHz	1	160.0	115.0	526	0.001023	1.000	0.10%
AT&T LTE 2300 MHz	1	100.0	115.0	526	0.000603	1.000	0.06%
AT&T LTE 719 MHz	1	80.0	115.0	526	0.000918	0.479	0.19%
AT&T LTE 739 MHz	1	160.0	115.0	526	0.001239	0.493	0.25%
AT&T LTE 763	1	160.0	115.0	526	0.001565	0.509	0.31%
AT&T LTE 885 MHz	1	160.0	115.0	526	0.001514	0.590	0.26%
AT&T UMTS 885 MHz	1	160.0	115.0	526	0.000195	0.590	0.03%
DISH 1900 MHz	1	160.0	105.0	526	0.001880	1.000	0.19%
DISH 2100 MHz	1	160.0	105.0	526	0.001756	1.000	0.18%
DISH 600 MHz	1	246.0	105.0	526	0.003300	0.400	0.82%
Sprint 2500 MHz	1	160.0	140.0	526	0.000122	1.000	0.01%
Sprint CDMA 1900 MHz	1	80.0	140.0	526	0.000055	1.000	0.01%
Sprint CDMA 850 MHz	1	20.0	140.0	526	0.000038	0.567	0.01%
Sprint LTE 1900 MHz	1	80.0	140.0	526	0.000055	1.000	0.01%
Sprint LTE 850 MHz	1	40.0	140.0	526	0.000075	0.567	0.01%
T-Mobile 2500 MHz	1	240.0	150.0	526	0.000450	1.000	0.05%
T-Mobile GSM 1900 MHz	1	120.0	150.0	526	0.000481	1.000	0.05%
T-Mobile LTE 1900 MHz	1	160.0	150.0	526	0.000641	1.000	0.06%
T-Mobile LTE 2100 MHz	1	120.0	150.0	526	0.000420	1.000	0.04%
T-Mobile LTE 600 MHz	1	160.0	150.0	526	0.000116	0.400	0.03%
T-Mobile LTE 700 MHz	1	160.0	150.0	526	0.000116	0.500	0.02%
T-Mobile UMTS 1900 MHz	1	80.0	150.0	526	0.000321	1.000	0.03%
Verizon 3700 MHz	1	200.0	127.5	526	0.045283	1.000	4.53%
Verizon CDMA/EVDO 885 MHz	1	20.0	127.5	526	0.000125	0.590	0.02%
Verizon LTE 1900 MHz	1	160.0	127.5	526	0.000278	1.000	0.03%
Verizon LTE 2100 MHz	1	240.0	127.5	526	0.000480	1.000	0.05%
Verizon LTE 750 MHz	1	160.0	127.5	526	0.001957	0.497	0.39%
Verizon LTE 850 MHz	1	160.0	127.5	526	0.002241	0.567	0.40%
						Total	**8.21%**

Table 2: Maximum Percent of General Population Exposure Values[4][5][6][7]

[4] Antenna information for Dish was taken from Fox Hill Telecom, Inc, Radio Frequency Emissions Analysis Report, dated 07/12/2022

[5] Antenna information for AT&T was taken from Connecticut Siting Council – Notice of Exempt Modification, dated 2/2/2021

[6] Antenna information for T-Mobile was taken from Connecticut Siting Council – Notice of Exempt Modification, dated 9/13/2021

[7] Antenna information for Sprint was taken from Connecticut Siting Council – Notice of Exempt Modification, dated 4/18/2018

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be **8.21% of the FCC limit (General Population/Uncontrolled)**. This maximum cumulative percent of MPE value is calculated to occur 526 feet away from the site.

7. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer 1
C Squared Systems, LLC

February 22, 2023
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

February 23, 2023
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[8]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[9]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 3: FCC Limits for Maximum Permissible Exposure

[8] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[9] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

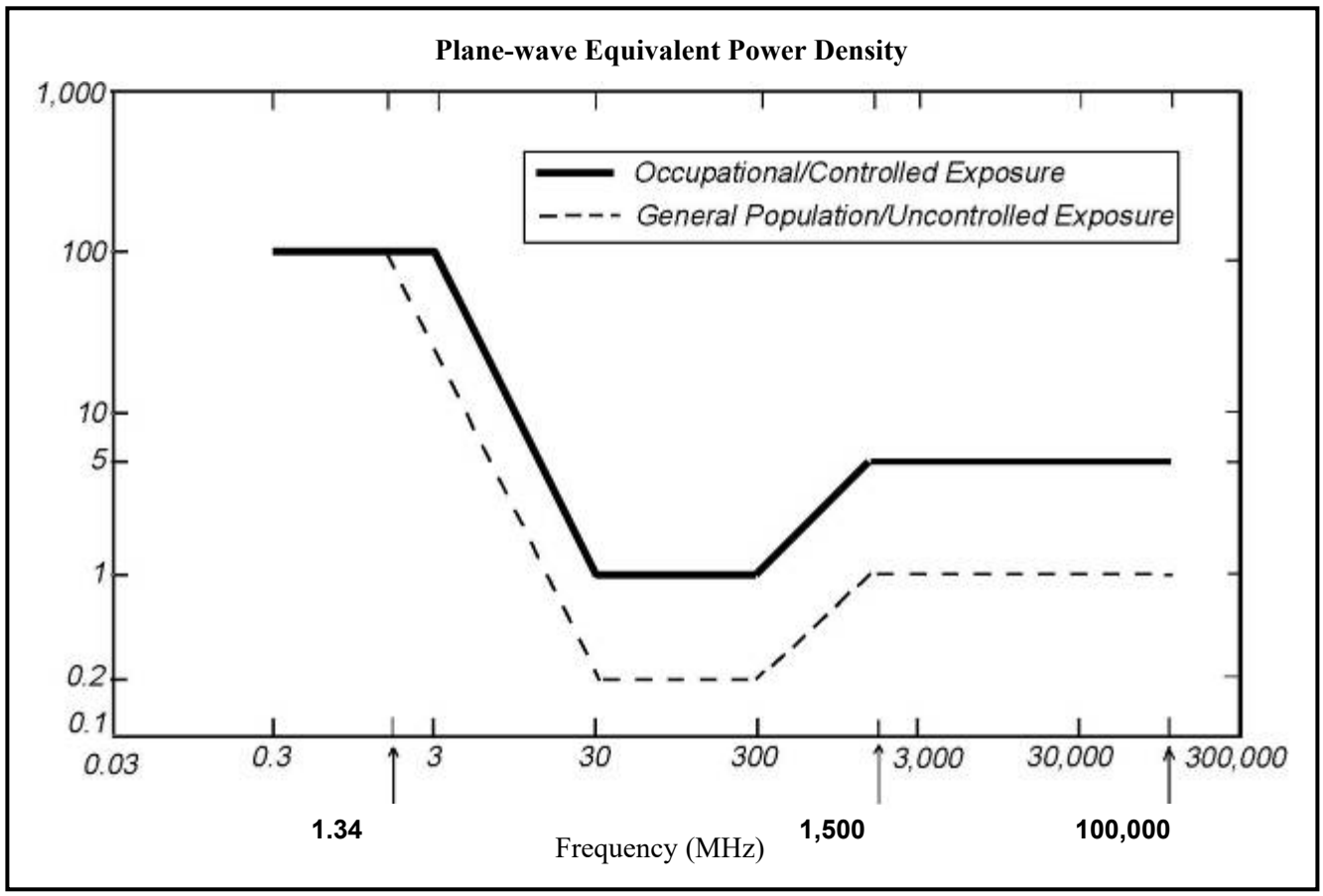
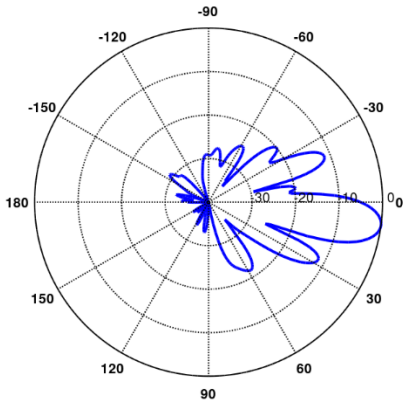


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

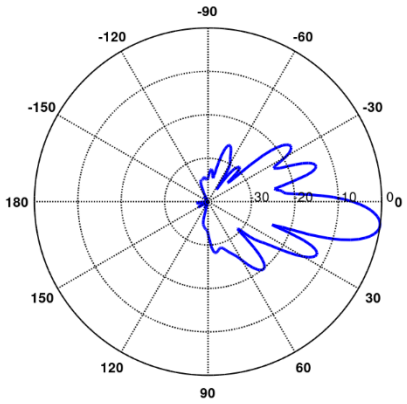
750 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	698-787 MHz
Gain:	14.5 dBi
Vertical Beamwidth:	12.4°
Horizontal Beamwidth:	67°
Polarization:	±45°
Dimensions (L x W x D):	71.9” x 13.8” x 8.2”



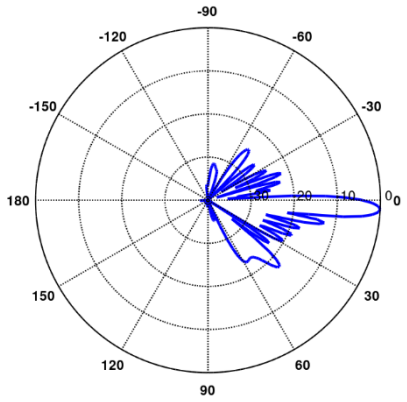
885 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	824-894 MHz
Gain:	15.8 dBi
Vertical Beamwidth:	10.5°
Horizontal Beamwidth:	65°
Polarization:	±45°
Dimensions (L x W x D):	71.9” x 13.8” x 8.2”



1900 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	1850-1990 MHz
Gain:	18.4 dBi
Vertical Beamwidth:	5.2°
Horizontal Beamwidth:	63°
Polarization:	±45°
Dimensions (L x W x D):	71.9” x 13.8” x 8.2”



2100 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	1920-2200 MHz
Gain:	18.5 dBi
Vertical Beamwidth:	4.9°
Horizontal Beamwidth:	65°
Polarization:	±45°
Dimensions (L x W x D):	71.9” x 13.8” x 8.2”