



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

November 1, 2023

Domenica Tatasciore
Site Acquisition Specialist
Crown Castle
1800 West Park Drive
Westborough, MA 01581
Domenica.Tatasciore@crowncastle.com

RE: **EM-VER-161-230830** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 128 Mather Street, Wilton, Connecticut. **Request for Project Change.**

Dear Domenica Tatasciore:

The Connecticut Siting Council (Council) is in receipt of the correspondence dated October 25, 2023 regarding a project change for the above-referenced exempt modification request acknowledged by the Council on September 25, 2023.

Pursuant to Condition No. 1 of the Council's September 25, 2023 exempt modification approval, the request to increase the number of Kaelus BSF0020F3V1-1 mitigation filters to be installed from three to six is hereby approved.

This approval applies only to the project change in the correspondence dated October 25, 2023.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/ANM/dll

c: The Honorable Lynne Vanderslice, First Selectperson, Town of Wilton (lynne.vanderslice@wiltonct.org)

From: Tatasciore, Domenica <Domenica.Tatasciore@crowncastle.com>

Sent: Wednesday, October 25, 2023 11:16 AM

To: Bachman, Melanie <Melanie.Bachman@ct.gov>

Cc: CSC-DL Siting Council <Siting.Council@ct.gov>

Subject: UPDATE - Council Decision - EM-VER-161-230830 - Verizon Wireless 128 Mather Street, Wilton

Hi Melanie,

The CSC's approval for this site was issued on September 25, 2023 (attached). It has recently been brought to Crown Castle's attention that a series of Verizon filter applications do not accurately capture the correct number of filters proposed in the work order. Crown Castle is looking to correct the information provided to you. For EM-VER-161-230830, the application and Structural Analysis cites 3 Kaelus filters; the Mount Analysis correctly states that 6 filters are proposed. A new Structural Analysis Report, attached, has been revised to correctly include 6 filters.

Crown Castle is requesting if you are able to administratively approve this correction through this email request.

Please advise if you have any questions or require anything else.

Thank you,

DOMENICA TATASCIORE

Site Acquisition Specialist

T: 508-621-9161

CROWN CASTLE

1800 West Park Drive, Westborough, MA 01581

CrownCastle.com

Date: **October 19, 2023**



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

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 5000383039
Site Name: WILTON CT

Crown Castle Designation: **BU Number:** 806353
Site Name: BRG 124 943066
JDE Job Number: 751324
Work Order Number: 2265146
Order Number: 654635 Rev. 1

Engineering Firm Designation: **Crown Castle Project Number:** 2265146

Site Data: **128 MATHER STREET, WILTON, FAIRFIELD County, CT**
Latitude 41° 14' 18.7", Longitude -73° 25' 26.9"
180 Foot - Self Support Tower

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

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

LC7: Proposed Equipment Configuration

Sufficient Capacity - 88.1%

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

Structural analysis prepared by: Matthew Schmitt

Respectfully submitted by:

Rohit Soni, P.E.
Senior Project Engineer

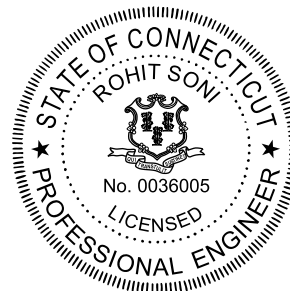


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1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by FWT INC. The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	116 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
163.0	164.0	6	commscope	JAHH-65B-R3B w/ Mount Pipe	2	1-5/8
		6	kaelus	BSF0020F3V1		
		2	raycap	RRFDC-3315-PF-48		
		3	samsung telecommunications	CBRS-RT4401-48A w/ Mount Pipe		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
	3	samsung telecommunications	RFV01U-D2A			
	163.0	1		Sector Mount [SM 702-3](16')		
	160.0	3	commscope	CBC78T-DS-43-2X		
62.0	65.0	1	gps	GPS_A	1	1/2
	62.0	1	tower mounts	Side Arm Mount [SO 305-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
178.0	184.0	1	rfs celwave	PD10017	2	7/8
170.0	174.0	3	fujitsu	TA08025-B604	1	1-3/4
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
	1	raycap	RDIDC-9181-PF-48			
	170.0	1	tower mounts	Commscope MTC3975083 (3)		
154.0	158.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	2	3/8
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe	6	5/8
		3	ericsson	RRUS 32 B2	12	1-5/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	kaelus	DBC0061F1V51-2		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8F		
	154.0	1	tower mounts	Sector Mount [SM 1303-3]		
145.0	146.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	-	-
		3	alcatel lucent	800MHZ 2X50W RRH		
		3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ		
143.0	143.0	3		Site Pro1 VFA12-HD Mount	3	1-5/8
		3	commscope	VV-65B-R1_TMO w/ Mount Pipe		
		3	ericsson	AIR 6419 B41_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
124.0	131.0	3	dbspectra	DS7C09P36UxD w/ Mount Pipe	1 3	1/2 1-5/8
	124.0	1	tower mounts	Side Arm Mount [SO 308-3]		
		1	tx rx systems	440 SERUES TTA SYSTEM		
115.0	115.0	1		VHLP3-11W	1	EW90
		1	tower mounts	Pipe Mount [PM 601-1]		
104.0	111.0	1	rfs celwave	1142-2C	1 1	1/2 7/8
	108.0	1	rfs celwave	220-3BN		
	104.0	2	tower mounts	Side Arm Mount [SO 303-1]		
93.0	93.0	3	ericsson	AIR 32 B2a/B66Aa	4	1-5/8
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20		
		1	tower mounts	Sector Mount [SM 404-3]		
42.0	44.0	1	gps	GPS_A	1	1/2
	42.0	1	tower mounts	Side Arm Mount [SO 305-1]		
31.0	32.0	1	gps	GPS_A	1	1/2
	31.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	262283	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	262285	CCISITES
4-TOWER MANUFACTURER DRAWINGS	217757	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	801524	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2434484	CCISITES
4-POST-MODIFICATION INSPECTION	2575710	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	6061656	CCISITES
4-POST-MODIFICATION INSPECTION	6515894	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 168	Leg	P2x0.154	2	-3.663	29.380	12.5	Pass
T2	168 - 160	Leg	P2x0.154 (GR)	27	-12.586	40.351	31.2	Pass
T3	160 - 140	Leg	P3x0.216 (GR)	41	-50.875	91.364	55.7	Pass
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-86.277	128.240	67.3	Pass
T5	120 - 100	Leg	P4x.337 (GR)	88	-118.080	165.049	71.5	Pass
T6	100 - 80	Leg	P5x0.375 (GR)	109	124.111	202.133	61.4	Pass
T7	80 - 60	Leg	P6x0.432	130	-176.643	238.435	74.1	Pass
T8	60 - 40	Leg	P6x0.432	145	-205.129	238.435	86.0	Pass
T9	40 - 20	Leg	P6x0.432	160	-231.968	266.933	86.9	Pass
T10	20 - 0	Leg	P8x.5	181	-259.457	386.074	67.2	Pass
T1	180 - 168	Diagonal	L2x1 1/2x3/16	9	-0.833	15.935	5.2	Pass
T2	168 - 160	Diagonal	L2x1 1/2x3/16	30	-2.541	15.935	15.9	Pass
T3	160 - 140	Diagonal	L2x1 1/2x3/16	45	-4.185	10.157	41.2	Pass
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.587	9.511	48.2	Pass
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-4.827	9.472	51.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail	
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-5.591	10.923	51.2	Pass	
T7	80 - 60	Diagonal	L3x3x3/16	133	-6.621	11.950	55.4	Pass	
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.020	15.837	44.3	Pass	
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.096	13.218	61.3	Pass	
T10	20 - 0	Diagonal	L3 1/2x3 /12x1/4	184	-8.317	14.432	57.6	Pass	
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	171	-4.023	15.131	26.6	Pass	
T1	180 - 168	Top Girt	L2x1 1/2x3/16	4	-0.125	10.904	1.1	Pass	
							Summary		
							Leg (T9)	86.9	Pass
							Diagonal (T9)	61.3	Pass
							Secondary Horizontal (T9)	26.6	Pass
							Top Girt (T1)	1.1	Pass
							Bolt Checks	84.5	Pass
							Rating =	86.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	57.1	Pass
1	Base Foundation (Structure)	0	87.3	Pass
1	Base Foundation (Soil Interaction)	0	88.1	Pass

Structure Rating (max from all components) =	88.1%
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Notes:

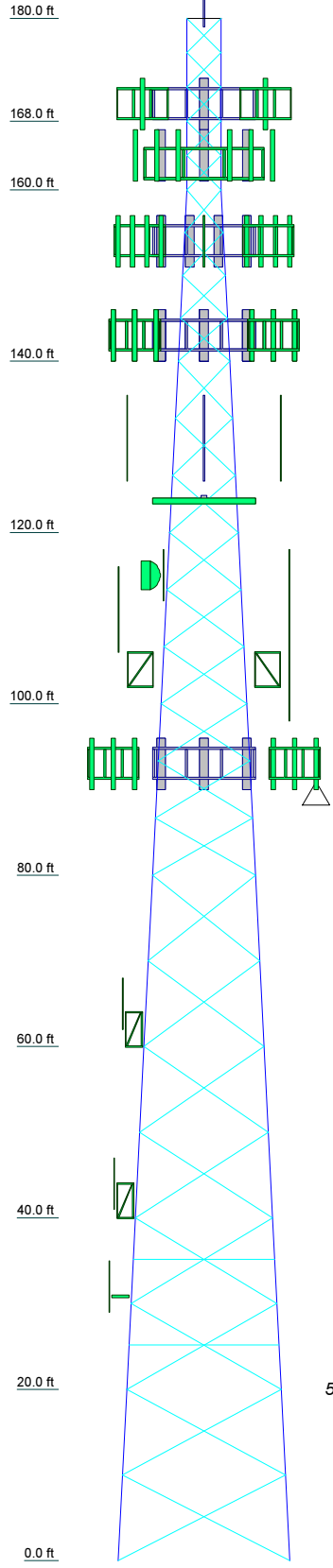
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs	P2x0.154	A	P3x0.216 (GR)	P3.5x.318 (GR)	P4x.337 (GR)	P5x0.375 (GR)	P6x0.432	P8x.5		
Leg Grade						A53-B-35				
Diagonals						L2 1/2x2 1/2x3/16	L3x3x3/16	L3 1/2x3x1/4		
Diagonal Grade						A36				
Top Girts										
Sec. Horizontals										
Face Width (ft)										
# Panels @ (ft)										
Weight (K)										



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2x0.154 (GR)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A36	36 ksi	58 ksi

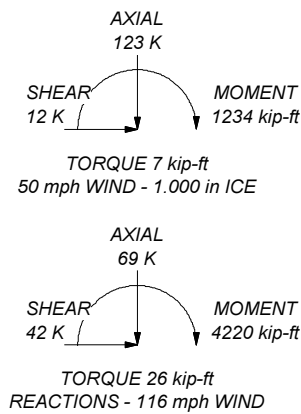
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 116 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Grouted pipe f_c is 7,000 ksi
9. TOWER RATING: 86.9%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 266 K
SHEAR: 27 K

UPLIFT: -221 K
SHEAR: 23 K



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

Job:	BU# 806353		
Project:			
Client:	Crown Castle	Drawn by:	Matthew Schmitt
Code:	TIA-222-H	Date:	10/19/23
Path:			Scale: NTS
			Dwg No. E-1

C:\Users\mschmitt\SAPI Work Area\806353\WO 2265146 - SA\Prod\806353.dwg

Tower Input Data

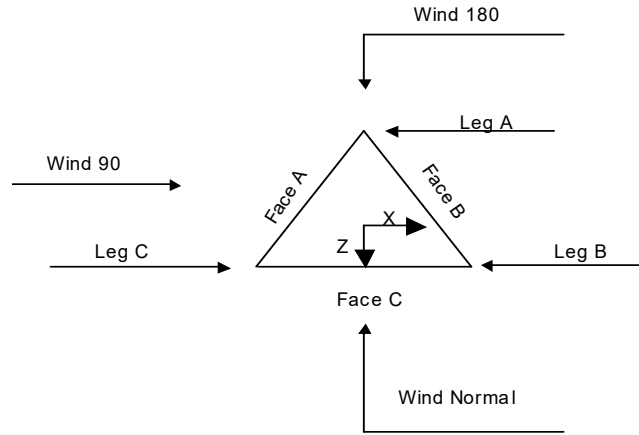
The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
 The base of the tower is set at an elevation of 0.000 ft above the ground line.
 The face width of the tower is 4.000 ft at the top and 20.000 ft at the base.
 This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower is located in Fairfield County, Connecticut.
- Tower base elevation above sea level: 427.000 ft.
- Basic wind speed of 116 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- Grouted pipe f_c is 7.000 ksi.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.000-168.000			4.000	1	12.000
T2	168.000-160.000			4.000	1	8.000
T3	160.000-140.000			4.000	1	20.000
T4	140.000-120.000			6.000	1	20.000
T5	120.000-100.000			8.000	1	20.000
T6	100.000-80.000			10.000	1	20.000
T7	80.000-60.000			12.000	1	20.000
T8	60.000-40.000			14.000	1	20.000
T9	40.000-20.000			16.000	1	20.000
T10	20.000-0.000			18.000	1	20.000

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	180.000-168.000	4.000	X Brace	No	No	0.000	0.000
T2	168.000-160.000	4.000	X Brace	No	No	0.000	0.000
T3	160.000-140.000	5.000	X Brace	No	No	0.000	0.000
T4	140.000-120.000	6.667	X Brace	No	No	0.000	0.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	120.000-100.000	6.667	X Brace	No	No	0.000	0.000
T6	100.000-80.000	6.667	X Brace	No	No	0.000	0.000
T7	80.000-60.000	10.000	X Brace	No	No	0.000	0.000
T8	60.000-40.000	10.000	X Brace	No	No	0.000	0.000
T9	40.000-20.000	10.000	X Brace	No	Yes	0.000	0.000
T10	20.000-0.000	10.000	X Brace	No	No	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-168.000	Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T2 168.000-160.000	Grouted Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T3 160.000-140.000	Grouted Pipe	P3x0.216	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T4 140.000-120.000	Grouted Pipe	P3.5x.318	A53-B-35 (35 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T5 120.000-100.000	Grouted Pipe	P4x.337	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 100.000-80.000	Grouted Pipe	P5x0.375	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.000-60.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 60.000-40.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T9 40.000-20.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T10 20.000-0.000	Pipe	P8x.5	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3 /12x1/4	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 180.000-168.000	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 40.000-20.000	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
T1 180.000-168.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 168.000-160.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T3 160.000-140.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T4 140.000-120.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.000-100.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.000-80.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.000-60.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.000-40.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.000-20.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.000-0.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹							
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
											X
ft				Y	Y	Y	Y	Y	Y	Y	
T1 180.000-168.000	Yes	No	1	1	1	1	1	1	1	1	1
T2 168.000-160.000	Yes	No	1	1	1	1	1	1	1	1	1
T3 160.000-140.000	Yes	No	1	1	1	1	1	1	1	1	1
T4 140.000-120.000	Yes	No	1	1	1	1	1	1	1	1	1
T5 120.000-100.000	Yes	No	1	1	1	1	1	1	1	1	1
T6 100.000-80.000	Yes	No	1	1	1	1	1	1	1	1	1
T7 80.000-60.000	Yes	No	1	1	1	1	1	1	1	1	1
T8 60.000-40.000	Yes	No	1	1	1	1	1	1	1	1	1
T9 40.000-20.000	Yes	No	1	1	1	1	1	1	1	1	1
T10 20.000-0.000	No	No	1	1	1	1	1	1	1	1	1

¹Note: 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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	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
T1 180.000-168.000	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 168.000-160.000	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 160.000-140.000	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 140.000-120.000	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 120.000-100.000	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 100.000-80.000	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 80.000-60.000	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 60.000-40.000	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
T9 40.000-20.000	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
T10 20.000-0.000	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		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
T1 180.000-168.000	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 168.000-160.000	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 160.000-140.000	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 140.000-120.000	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
T5 120.000-100.000	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 100.000-80.000	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 80.000-60.000	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 60.000-40.000	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
T9 40.000-20.000	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
T10 20.000-0.000	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 180.000-168.000	Flange	0.625 A325N	0	0.625 A325N	1	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0

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.
T2 168.000-160.000	Flange	0.625 A325N	4	0.625 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T3 160.000-140.000	Flange	0.625 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T4 140.000-120.000	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T5 120.000-100.000	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T6 100.000-80.000	Flange	0.875 A490N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T7 80.000-60.000	Flange	0.875 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T8 60.000-40.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T9 40.000-20.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.500 A325N	1
T10 20.000-0.000	Flange	1.500 A325N	0	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0

Grouted Pipe Properties

Size	F _y ksi	A _s in ²	A _c in ²	Wt plf	E _c ksi	E _m ksi	F _{ym} ksi
P2x0.154 (GR)	35.000	1.075	3.356	10.647	4768.962	40914.218	53.581
P3x0.216 (GR)	35.000	2.228	7.393	22.984	4768.962	41656.327	54.738
P3.5x.318 (GR)	35.000	3.678	8.888	31.033	4768.962	38218.387	49.377
P4x.337 (GR)	35.000	4.407	11.497	38.949	4768.962	38951.934	50.521
P5x0.375 (GR)	35.000	6.111	18.190	58.691	4768.962	40355.493	52.710

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
LDF4-50A(1/2") Feedline Ladder (Af)	C	No	No	Ar (CaAa)	31.000 - 0.000	-1.000	-0.32	1	1	0.850 0.750	0.630		0.150
	C	No	No	Af (CaAa)	180.000 - 0.000	-1.000	-0.33	2	1	3.000	3.000		8.400
Climbing Ladder	C	No	No	Af (CaAa)	180.000 - 0.000	0.000	0.025	1	1	3.000	0.000		7.900
Safety Line 3/8	C	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.025	1	1	0.375	0.375		0.220
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	93.000 - 0.000	0.000	0.05	4	2	0.850 0.750	1.660		2.400
LDF6-50A(1-1/4) Feedline Ladder (Af)	B	No	No	Ar (CaAa)	93.000 - 0.000	0.000	0.15	6	6	0.850 0.750	1.550		0.600
	B	No	No	Af (CaAa)	93.000 - 0.000	0.000	0.1	1	1	3.000	3.000		8.400
LCF158-50JA-A0(1-5/8)	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.3	12	6	0.850 0.750	1.980		0.800
WR-VG82ST-BRDA(5/8)	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.365	3	2	0.500	0.645		0.307

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
WR-VG82ST-BRDA(5/8) Feedline	B	No	No	Ar (CaAa)	154.000 - 0.000	5.500	0.3	5	5	1.500 1.000	0.645		0.307
Ladder (Af)	B	No	No	Af (CaAa)	154.000 - 0.000	0.000	0.32	1	1	3.000	3.000		8.400
2-1/4" Rigid Conduit *	B	No	No	Ar (CaAa)	155.000 - 0.000	0.000	0.385	1	1	0.850 0.750	2.250		3.000
LDF5-50A(7/8) *	B	No	No	Ar (CaAa)	104.000 - 0.000	0.000	0.345	1	1	0.850 0.750	1.090		0.330
CU12PSM6P 4XXX(1-3/4)	A	No	No	Ar (CaAa)	170.000 - 0.000	0.000	-0.09	1	1	0.850 0.750	1.750		2.720
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	62.000 - 0.000	0.000	-0.1	2	2	0.500	0.630		0.150
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	104.000 - 62.000	0.000	-0.1	1	1	0.500	0.630		0.150
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	124.000 - 0.000	0.000	0	1	1	3.000	3.000		8.400
HB158-1-08U8-S8J18(1-5/8)	A	No	No	Ar (CaAa)	163.000 - 0.000	0.000	0.1	2	2	0.850 0.750	1.980		1.300
T-Brackets (Af) *	A	No	No	Af (CaAa)	164.000 - 0.000	0.000	0.1	1	1	1.000	1.000		8.400
FSJ4-50B(1/2") *	A	No	No	Ar (CaAa)	42.000 - 0.000	0.000	0.03	1	1	0.850 0.750	0.520		0.140
HB158-21U6S24-xxM_TMO(1-5/8) *	A	No	No	Ar (CaAa)	143.000 - 0.000	0.000	0.14	3	2	0.850 0.750	1.996		2.500
LDF5-50A(7/8") *	A	No	No	Ar (CaAa)	178.000 - 0.000	5.500	0.1	2	2	0.850 0.750	1.090		0.330
(3/8") Ground Cables ***	A	No	No	Ar (CaAa)	162.000 - 0.000	0.000	-0.15	2	2	0.500	0.440		0.080
EC4-50(1/2)	A	No	No	Ar (CaAa)	124.000 - 0.000	2.000	-0.05	1	1	0.630	0.630		0.160
EC7-50A(1-5/8)	A	No	No	Ar (CaAa)	124.000 - 0.000	0.000	-0.1	3	3	1.970	1.970		0.680
EW90(ELLIP TICAL) ***	A	No	No	Ar (CaAa)	115.000 - 0.000	0.000	-0.3	1	1	1.280	1.280		0.320

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA ft ² /ft	Weight plf

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T1	180.000-168.000	A	0.000	0.000	2.530	0.000	0.012
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	12.450	0.000	0.299
T2	168.000-160.000	A	0.000	0.000	5.175	0.000	0.069
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	8.300	0.000	0.199
T3	160.000-140.000	A	0.000	0.000	22.670	0.000	0.313
		B	0.000	0.000	50.863	0.000	0.331
		C	0.000	0.000	20.750	0.000	0.498
T4	140.000-120.000	A	0.000	0.000	37.465	0.000	0.483
		B	0.000	0.000	72.340	0.000	0.469
		C	0.000	0.000	20.750	0.000	0.498
T5	120.000-100.000	A	0.000	0.000	58.101	0.000	0.658
		B	0.000	0.000	72.776	0.000	0.470
		C	0.000	0.000	20.750	0.000	0.498
T6	100.000-80.000	A	0.000	0.000	59.749	0.000	0.662
		B	0.000	0.000	101.742	0.000	0.757
		C	0.000	0.000	20.750	0.000	0.498
T7	80.000-60.000	A	0.000	0.000	59.875	0.000	0.662
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	20.750	0.000	0.498
T8	60.000-40.000	A	0.000	0.000	61.113	0.000	0.665
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	20.750	0.000	0.498
T9	40.000-20.000	A	0.000	0.000	62.049	0.000	0.668
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	21.443	0.000	0.500
T10	20.000-0.000	A	0.000	0.000	62.049	0.000	0.668
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	22.010	0.000	0.501

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T1	180.000-168.000	A	1.004	0.000	0.000	8.143	0.000	0.064
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	22.086	0.000	0.487
T2	168.000-160.000	A	0.998	0.000	0.000	14.355	0.000	0.169
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	14.686	0.000	0.324
T3	160.000-140.000	A	0.989	0.000	0.000	63.006	0.000	0.743
		B		0.000	0.000	79.352	0.000	1.113
		C		0.000	0.000	36.573	0.000	0.806
T4	140.000-120.000	A	0.975	0.000	0.000	91.365	0.000	1.138
		B		0.000	0.000	112.370	0.000	1.567
		C		0.000	0.000	36.348	0.000	0.800
T5	120.000-100.000	A	0.959	0.000	0.000	130.342	0.000	1.635
		B		0.000	0.000	113.129	0.000	1.563
		C		0.000	0.000	36.090	0.000	0.794
T6	100.000-80.000	A	0.940	0.000	0.000	134.803	0.000	1.657
		B		0.000	0.000	165.757	0.000	2.265
		C		0.000	0.000	35.785	0.000	0.786
T7	80.000-60.000	A	0.916	0.000	0.000	133.913	0.000	1.629
		B		0.000	0.000	190.696	0.000	2.594
		C		0.000	0.000	35.412	0.000	0.776
T8	60.000-40.000	A	0.886	0.000	0.000	137.717	0.000	1.614
		B		0.000	0.000	189.227	0.000	2.547
		C		0.000	0.000	34.927	0.000	0.764
T9	40.000-20.000	A	0.842	0.000	0.000	138.726	0.000	1.585
		B		0.000	0.000	187.090	0.000	2.480
		C		0.000	0.000	36.766	0.000	0.765
T10	20.000-0.000	A	0.754	0.000	0.000	132.543	0.000	1.474
		B		0.000	0.000	182.855	0.000	2.350
		C		0.000	0.000	37.097	0.000	0.742

Feed Line Center of Pressure

Section	Elevation	CP_x	CP_z	CP_x Ice	CP_z Ice
	ft	in	in	in	in
T1	180.000-168.000	0.798	2.979	0.484	2.876
T2	168.000-160.000	-0.480	2.003	-1.254	1.506
T3	160.000-140.000	5.173	2.512	4.123	1.985
T4	140.000-120.000	6.301	2.133	5.351	1.758
T5	120.000-100.000	3.843	1.756	2.513	1.321
T6	100.000-80.000	7.342	1.391	5.816	1.060
T7	80.000-60.000	9.794	1.256	8.125	0.937
T8	60.000-40.000	10.097	1.362	8.526	1.017
T9	40.000-20.000	9.565	1.410	8.337	1.127
T10	20.000-0.000	11.643	1.819	10.045	1.595

Shielding Factor K_a

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	4	Feedline Ladder (Af)	168.00 - 180.00	0.6000	0.5970
T1	6	Climbing Ladder	168.00 - 180.00	0.6000	0.5970
T1	7	Safety Line 3/8	168.00 - 180.00	0.6000	0.5970
T1	23	CU12PSM6P4XXX(1-3/4)	168.00 - 170.00	0.6000	0.5970
T1	39	LDF5-50A(7/8")	168.00 - 178.00	0.6000	0.5970
T2	4	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T2	6	Climbing Ladder	160.00 - 168.00	0.6000	0.6000
T2	7	Safety Line 3/8	160.00 - 168.00	0.6000	0.6000
T2	23	CU12PSM6P4XXX(1-3/4)	160.00 - 168.00	0.6000	0.6000
T2	30	HB158-1-08U8-S8J18(1-5/8)	160.00 - 163.00	0.6000	0.6000
T2	31	T-Brackets (Af)	160.00 - 164.00	0.6000	0.6000
T2	39	LDF5-50A(7/8")	160.00 - 168.00	0.6000	0.6000
T2	41	(3/8") Ground Cables	160.00 - 162.00	0.6000	0.6000
T3	4	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	6	Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T3	7	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	13	LCF158-50JA-A0(1-5/8)	140.00 - 154.00	0.6000	0.6000
T3	14	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	16	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	18	Feedline Ladder (Af)	140.00 - 154.00	0.6000	0.6000
T3	19	2-1/4" Rigid Conduit	140.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			155.00		
T3	23	CU12PSM6P4XXX(1-3/4)	140.00 - 160.00	0.6000	0.6000
T3	30	HB158-1-08U8-S8J18(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	31	T-Brackets (Af)	140.00 - 160.00	0.6000	0.6000
T3	36	HB158-21U6S24-xxM_TMO(1-5/8)	140.00 - 143.00	0.6000	0.6000
T3	39	LDF5-50A(7/8")	140.00 - 160.00	0.6000	0.6000
T3	41	(3/8") Ground Cables	140.00 - 160.00	0.6000	0.6000
T4	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	6	Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T4	7	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	13	LCF158-50JA-A0(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	14	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	16	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	18	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	19	2-1/4" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	23	CU12PSM6P4XXX(1-3/4)	120.00 - 140.00	0.6000	0.6000
T4	27	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T4	30	HB158-1-08U8-S8J18(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	31	T-Brackets (Af)	120.00 - 140.00	0.6000	0.6000
T4	36	HB158-21U6S24-xxM_TMO(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	39	LDF5-50A(7/8")	120.00 - 140.00	0.6000	0.6000
T4	41	(3/8") Ground Cables	120.00 - 140.00	0.6000	0.6000
T4	43	EC4-50(1/2)	120.00 - 124.00	0.6000	0.6000
T4	44	EC7-50A(1-5/8)	120.00 - 124.00	0.6000	0.6000
T5	4	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	6	Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T5	7	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	13	LCF158-50JA-A0(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	14	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	16	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	18	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	19	2-1/4" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	21	LDF5-50A(7/8)	100.00 - 104.00	0.6000	0.6000
T5	23	CU12PSM6P4XXX(1-3/4)	100.00 - 120.00	0.6000	0.6000
T5	25	LDF4-50A(1/2)	100.00 - 104.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T5	27	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	30	HB158-1-08U8-S8J18(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	31	T-Brackets (Af)	100.00 - 120.00	0.6000	0.6000
T5	36	HB158-21U6S24-xxM_TMO(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	39	LDF5-50A(7/8")	100.00 - 120.00	0.6000	0.6000
T5	41	(3/8") Ground Cables	100.00 - 120.00	0.6000	0.6000
T5	43	EC4-50(1/2)	100.00 - 120.00	0.6000	0.6000
T5	44	EC7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	45	EW90(ELLIPTICAL)	100.00 - 115.00	0.6000	0.6000
T6	4	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	6	Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T6	7	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	9	HCS 6X12 4AWG(1-5/8)	80.00 - 93.00	0.6000	0.6000
T6	10	LDF6-50A(1-1/4)	80.00 - 93.00	0.6000	0.6000
T6	11	Feedline Ladder (Af)	80.00 - 93.00	0.6000	0.6000
T6	13	LCF158-50JA-A0(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	14	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000
T6	16	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000
T6	18	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	19	2-1/4" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	21	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.6000
T6	23	CU12PSM6P4XXX(1-3/4)	80.00 - 100.00	0.6000	0.6000
T6	25	LDF4-50A(1/2)	80.00 - 100.00	0.6000	0.6000
T6	27	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	30	HB158-1-08U8-S8J18(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	31	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T6	36	HB158-21U6S24-xxM_TMO(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	39	LDF5-50A(7/8")	80.00 - 100.00	0.6000	0.6000
T6	41	(3/8") Ground Cables	80.00 - 100.00	0.6000	0.6000
T6	43	EC4-50(1/2)	80.00 - 100.00	0.6000	0.6000
T6	44	EC7-50A(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	45	EW90(ELLIPTICAL)	80.00 - 100.00	0.6000	0.6000
T7	4	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	6	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T7	7	Safety Line 3/8	60.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			80.00		
T7	9	HCS 6X12 4AWG(1-5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	10	LDF6-50A(1-1/4)	60.00 -	0.6000	0.6000
			80.00		
T7	11	Feedline Ladder (Af)	60.00 -	0.6000	0.6000
			80.00		
T7	13	LCF158-50JA-A0(1-5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	14	WR-VG82ST-BRDA(5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	16	WR-VG82ST-BRDA(5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	18	Feedline Ladder (Af)	60.00 -	0.6000	0.6000
			80.00		
T7	19	2-1/4" Rigid Conduit	60.00 -	0.6000	0.6000
			80.00		
T7	21	LDF5-50A(7/8)	60.00 -	0.6000	0.6000
			80.00		
T7	23	CU12PSM6P4XXX(1-3/4)	60.00 -	0.6000	0.6000
			80.00		
T7	24	LDF4-50A(1/2)	60.00 -	0.6000	0.6000
			62.00		
T7	25	LDF4-50A(1/2)	62.00 -	0.6000	0.6000
			80.00		
T7	27	Feedline Ladder (Af)	60.00 -	0.6000	0.6000
			80.00		
T7	30	HB158-1-08U8-S8J18(1-5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	31	T-Brackets (Af)	60.00 -	0.6000	0.6000
			80.00		
T7	36	HB158-21U6S24-xxM_TMO(1-5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	39	LDF5-50A(7/8")	60.00 -	0.6000	0.6000
			80.00		
T7	41	(3/8") Ground Cables	60.00 -	0.6000	0.6000
			80.00		
T7	43	EC4-50(1/2)	60.00 -	0.6000	0.6000
			80.00		
T7	44	EC7-50A(1-5/8)	60.00 -	0.6000	0.6000
			80.00		
T7	45	EW90(ELLIPTICAL)	60.00 -	0.6000	0.6000
			80.00		
T8	4	Feedline Ladder (Af)	40.00 -	0.6000	0.6000
			60.00		
T8	6	Climbing Ladder	40.00 -	0.6000	0.6000
			60.00		
T8	7	Safety Line 3/8	40.00 -	0.6000	0.6000
			60.00		
T8	9	HCS 6X12 4AWG(1-5/8)	40.00 -	0.6000	0.6000
			60.00		
T8	10	LDF6-50A(1-1/4)	40.00 -	0.6000	0.6000
			60.00		
T8	11	Feedline Ladder (Af)	40.00 -	0.6000	0.6000
			60.00		
T8	13	LCF158-50JA-A0(1-5/8)	40.00 -	0.6000	0.6000
			60.00		
T8	14	WR-VG82ST-BRDA(5/8)	40.00 -	0.6000	0.6000
			60.00		
T8	16	WR-VG82ST-BRDA(5/8)	40.00 -	0.6000	0.6000
			60.00		
T8	18	Feedline Ladder (Af)	40.00 -	0.6000	0.6000
			60.00		
T8	19	2-1/4" Rigid Conduit	40.00 -	0.6000	0.6000
			60.00		
T8	21	LDF5-50A(7/8)	40.00 -	0.6000	0.6000
			60.00		
T8	23	CU12PSM6P4XXX(1-3/4)	40.00 -	0.6000	0.6000
			60.00		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T8	24	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	27	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	30	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	31	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T8	33	FSJ4-50B(1/2")	40.00 - 42.00	0.6000	0.6000
T8	36	HB158-21U6S24-xxM_TMO(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	39	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	41	(3/8") Ground Cables	40.00 - 60.00	0.6000	0.6000
T8	43	EC4-50(1/2)	40.00 - 60.00	0.6000	0.6000
T8	44	EC7-50A(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	45	EW90(ELLIPTICAL)	40.00 - 60.00	0.6000	0.6000
T9	3	LDF4-50A(1/2")	20.00 - 31.00	0.6000	0.6000
T9	4	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	6	Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T9	7	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	9	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	10	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T9	11	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	13	LCF158-50JA-A0(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	14	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.6000	0.6000
T9	16	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.6000	0.6000
T9	18	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	19	2-1/4" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T9	21	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T9	23	CU12PSM6P4XXX(1-3/4)	20.00 - 40.00	0.6000	0.6000
T9	24	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T9	27	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	30	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	31	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T9	33	FSJ4-50B(1/2")	20.00 - 40.00	0.6000	0.6000
T9	36	HB158-21U6S24-xxM_TMO(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	39	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	41	(3/8") Ground Cables	20.00 - 40.00	0.6000	0.6000
T9	43	EC4-50(1/2)	20.00 - 40.00	0.6000	0.6000
T9	44	EC7-50A(1-5/8)	20.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T9	45	EW90(ELLIPTICAL)	40.00 20.00 - 40.00	0.6000	0.6000
T10	3	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T10	4	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	6	Climbing Ladder	0.00 - 20.00	0.6000	0.6000
T10	7	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	9	HCS 6X12 4AWG(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	10	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T10	11	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	13	LCF158-50JA-A0(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	14	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.6000	0.6000
T10	16	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.6000	0.6000
T10	18	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	19	2-1/4" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T10	21	LDF5-50A(7/8)	0.00 - 20.00	0.6000	0.6000
T10	23	CU12PSM6P4XXX(1-3/4)	0.00 - 20.00	0.6000	0.6000
T10	24	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000
T10	27	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	30	HB158-1-08U8-S8J18(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	31	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T10	33	FSJ4-50B(1/2")	0.00 - 20.00	0.6000	0.6000
T10	36	HB158-21U6S24-xxM_TMO(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	39	LDF5-50A(7/8")	0.00 - 20.00	0.6000	0.6000
T10	41	(3/8") Ground Cables	0.00 - 20.00	0.6000	0.6000
T10	43	EC4-50(1/2)	0.00 - 20.00	0.6000	0.6000
T10	44	EC7-50A(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	45	EW90(ELLIPTICAL)	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
*** PD10017	A	From Leg	0.500 0.000 6.000	0.000	178.000
* MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	170.000
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	170.000
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	170.000
TA08025-B604	A	From Leg	4.000 0.000 4.000	0.000	170.000
TA08025-B604	B	From Leg	4.000 0.000 4.000	0.000	170.000
TA08025-B604	C	From Leg	4.000 0.000 4.000	0.000	170.000

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft
			Horz Lateral ft	Vert ft		
TA08025-B605	A	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
TA08025-B605	B	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
TA08025-B605	C	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
RDIDC-9181-PF-48	A	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
Commscope MTC3975083 (3)	C	None			0.000	170.000
(2) 10' x 2" Mount Pipe	A	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
(2) 10' x 2" Mount Pipe	B	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
(2) 10' x 2" Mount Pipe	C	From Leg	4.000	4.000	0.000	170.000
			0.000	4.000		
4' x 2" Pipe Mount	A	From Leg	2.000	2.000	0.000	170.000
			0.000	2.000		
*			0.000	0.000		
*						
(2) BSF0020F3V1	A	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(2) BSF0020F3V1	B	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(2) BSF0020F3V1	C	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
CBRS-RT4401-48A w/ Mount Pipe	A	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
CBRS-RT4401-48A w/ Mount Pipe	B	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
CBRS-RT4401-48A w/ Mount Pipe	C	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	4.000	0.000	163.000
			0.000	1.000		
(3) CBC78T-DS-43-2X	A	From Leg	4.000	4.000	0.000	163.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000		
(2) RRFDC-3315-PF-48	B	From Leg	-3.000	0.000	163.000
			4.000		
			0.000		
(3) RFV01U-D1A	A	From Leg	1.000	0.000	163.000
			4.000		
			0.000		
RFV01U-D2A	A	From Leg	1.000	0.000	163.000
			4.000		
			0.000		
RFV01U-D2A	B	From Leg	1.000	0.000	163.000
			4.000		
			0.000		
RFV01U-D2A	C	From Leg	1.000	0.000	163.000
			4.000		
			0.000		
			1.000		
Sector Mount [SM 702-3](16')	C	None		0.000	163.000
Dual Antenna Mounting Bracket	A	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
Dual Antenna Mounting Bracket	B	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
Dual Antenna Mounting Bracket	C	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	163.000
			0.000		
			0.000		
*					
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
QS66512-2 w/ Mount Pipe	A	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
QS66512-2 w/ Mount Pipe	B	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
QS66512-2 w/ Mount Pipe	C	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000	0.000	154.000
			0.000		
			4.000		
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000	0.000	154.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000		
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000	0.000	154.000
			4.000		
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000	0.000	154.000
			0.000		
(2) LGP21401	A	From Leg	4.000	0.000	154.000
			4.000		
(2) LGP21401	B	From Leg	4.000	0.000	154.000
			0.000		
(2) LGP21401	C	From Leg	4.000	0.000	154.000
			4.000		
RRUS 32 B30	A	From Leg	4.000	0.000	154.000
			0.000		
RRUS 32 B30	B	From Leg	4.000	0.000	154.000
			0.000		
RRUS 32 B30	C	From Leg	4.000	0.000	154.000
			0.000		
RRUS 32 B2	A	From Leg	4.000	0.000	154.000
			0.000		
RRUS 32 B2	B	From Leg	4.000	0.000	154.000
			0.000		
RRUS 32 B2	C	From Leg	4.000	0.000	154.000
			0.000		
DBC0061F1V51-2	A	From Leg	4.000	0.000	154.000
			0.000		
DBC0061F1V51-2	B	From Leg	4.000	0.000	154.000
			0.000		
DBC0061F1V51-2	C	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4478 B14	A	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4478 B14	B	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4478 B14	C	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	154.000
			0.000		
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	154.000
			0.000		
(3) DC6-48-60-18-8F	A	From Leg	4.000	0.000	154.000
			4.000		
			0.000		
			4.000		

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
Sector Mount [SM 1303-3]	C	None		0.000	154.000
Pipe Mount [PM 601-3]	C	None		0.000	154.000
(2) 5' x 2" Pipe Mount	A	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
(2) 5' x 2" Pipe Mount	B	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
(2) 5' x 2" Pipe Mount	C	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
12.5' x 2.375" Horizontal Mount Pipe	A	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
12.5' x 2.375" Horizontal Mount Pipe	B	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
12.5' x 2.375" Horizontal Mount Pipe	C	From Leg	4.000	0.000	154.000
			0.000		
			0.000		
*					
800 EXTERNAL NOTCH FILTER	A	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
800 EXTERNAL NOTCH FILTER	B	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
800 EXTERNAL NOTCH FILTER	C	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
800MHZ 2X50W RRH	A	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
800MHZ 2X50W RRH	B	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
800MHZ 2X50W RRH	C	From Leg	1.000	0.000	145.000
			0.000		
			1.000		
*					
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.000	0.000	143.000
			0.000		
			0.000		
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	4.000	0.000	143.000
			0.000		
			0.000		
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.000	0.000	143.000
			0.000		
			0.000		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.000	0.000	143.000
			0.000		
			0.000		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.000	0.000	143.000
			0.000		
			0.000		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.000	0.000	143.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000		
VV-65B-R1_TMO w/ Mount Pipe	A	From Leg	0.000 4.000	0.000	143.000
VV-65B-R1_TMO w/ Mount Pipe	B	From Leg	0.000 4.000	0.000	143.000
VV-65B-R1_TMO w/ Mount Pipe	C	From Leg	0.000 4.000	0.000	143.000
RADIO 4460 B2/B25 B66_TMO	A	From Leg	0.000 4.000	0.000	143.000
RADIO 4460 B2/B25 B66_TMO	B	From Leg	0.000 4.000	0.000	143.000
RADIO 4460 B2/B25 B66_TMO	C	From Leg	0.000 4.000	0.000	143.000
Radio 4480_TMOV2	A	From Leg	0.000 4.000	0.000	143.000
Radio 4480_TMOV2	B	From Leg	0.000 4.000	0.000	143.000
Radio 4480_TMOV2	C	From Leg	0.000 4.000	0.000	143.000
Site Pro1 VFA12-HD Mount	A	From Leg	0.000 2.000	0.000	143.000
Site Pro1 VFA12-HD Mount	B	From Leg	0.000 2.000	0.000	143.000
Site Pro1 VFA12-HD Mount	C	From Leg	0.000 2.000	0.000	143.000
10' x 2" Mount Pipe	A	From Leg	0.000 4.000	0.000	143.000
10' x 2" Mount Pipe	B	From Leg	0.000 4.000	0.000	143.000
10' x 2" Mount Pipe	C	From Leg	0.000 4.000	0.000	143.000
6' x 2" Mount Pipe	A	From Leg	0.000 4.000	0.000	143.000
6' x 2" Mount Pipe	B	From Leg	0.000 4.000	0.000	143.000
6' x 2" Mount Pipe	C	From Leg	0.000 4.000	0.000	143.000
*			0.000		
DS7C09P36UxD w/ Mount Pipe	A	From Leg	6.000 0.000	0.000	124.000
DS7C09P36UxD w/ Mount Pipe	B	From Leg	7.000 6.000	0.000	124.000
DS7C09P36UxD w/ Mount Pipe	C	From Leg	0.000 7.000	0.000	124.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
440 SERUES TTA SYSTEM	A	From Leg	7.000 6.000 0.000 0.000	0.000	124.000
Side Arm Mount [SO 308-3] **	C	None		0.000	124.000
Pipe Mount [PM 601-1] **	C	From Leg	0.500 0.000 0.000	0.000	115.000
220-3BN	B	From Leg	6.000 0.000 4.000	0.000	104.000
1142-2C	C	From Leg	6.000 0.000 7.000	0.000	104.000
Side Arm Mount [SO 303-1]	B	From Leg	3.000 0.000 0.000	0.000	104.000
Side Arm Mount [SO 303-1]	C	From Leg	3.000 0.000 0.000	0.000	104.000
* APXVAARR24_43-U-NA20	A	From Leg	4.000 0.000 0.000	0.000	93.000
APXVAARR24_43-U-NA20	B	From Leg	4.000 0.000 0.000	0.000	93.000
APXVAARR24_43-U-NA20	C	From Leg	4.000 0.000 0.000	0.000	93.000
AIR 32 B2a/B66Aa	A	From Leg	4.000 0.000 0.000	0.000	93.000
AIR 32 B2a/B66Aa	B	From Leg	4.000 0.000 0.000	0.000	93.000
AIR 32 B2a/B66Aa	C	From Leg	4.000 0.000 0.000	0.000	93.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	93.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	93.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	93.000
KRY 112 144/1	A	From Leg	4.000 0.000 0.000	0.000	93.000
KRY 112 144/1	B	From Leg	4.000 0.000 0.000	0.000	93.000
KRY 112 144/1	C	From Leg	4.000 0.000 0.000	0.000	93.000
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	93.000
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	93.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	93.000
Sector Mount [SM 404-3] *	C	None		0.000	93.000
GPS_A	C	From Leg	3.000 0.000 3.000	0.000	62.000
Side Arm Mount [SO 305-1] *	C	From Leg	1.500 0.000 0.000	0.000	62.000
GPS_A	C	From Leg	3.000 0.000 2.000	0.000	42.000
Side Arm Mount [SO 305-1] *	C	From Leg	1.500 0.000 0.000	0.000	42.000
GPS_A	C	From Leg	3.000 0.000 1.000	0.000	31.000
Side Arm Mount [SO 701-1] *	C	From Leg	1.500 0.000 0.000	0.000	31.000
(2) 3'x8" Knife Plate	A	From Leg	0.000 0.000 0.000	0.000	20.000
(2) 3'x8" Knife Plate	B	From Leg	0.000 0.000 0.000	0.000	20.000
(2) 3'x8" Knife Plate	C	From Leg	0.000 0.000 0.000	0.000	20.000
(2) 3'x8" Knife Plate	A	From Leg	0.000 0.000 0.000	0.000	60.000
(2) 3'x8" Knife Plate	B	From Leg	0.000 0.000 0.000	0.000	60.000
(2) 3'x8" Knife Plate	C	From Leg	0.000 0.000 0.000	0.000	60.000
*					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
VHLP3-11W	C	Paraboloid w/Shroud (HP)	From Leg	1.000 0.000 0.000	-60.000		115.000	3.283

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
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 168	Leg	Max Tension	7	1.607	-0.096	0.063
			Max. Compression	10	-3.663	-0.107	-0.069
			Max. Mx	20	-1.092	-0.401	0.007
			Max. My	14	1.424	-0.002	0.389
			Max. Vy	20	-0.293	0.177	0.007
			Max. Vx	14	-0.300	-0.002	-0.198
		Diagonal	Max Tension	13	0.737	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T2	168 - 160	Top Girt	Max. Compression	10	-0.833	0.000	0.000	
			Max. Mx	34	0.048	0.010	0.000	
			Max. My	12	0.721	0.007	0.002	
			Max. Vy	34	-0.010	0.010	0.000	
			Max. Vx	12	0.001	0.000	0.000	
			Max Tension	18	0.159	0.000	0.000	
		Leg	Max. Compression	15	-0.125	0.000	0.000	
			Max. Mx	26	0.039	-0.014	0.000	
			Max. Vy	26	0.014	0.000	0.000	
			Max Tension	7	7.937	-0.222	0.129	
			Max. Compression	2	-12.586	0.028	0.259	
			Max. Mx	20	-3.418	-0.528	0.015	
			Max. My	14	-7.233	0.045	0.525	
			Max. Vy	8	-0.723	-0.194	-0.012	
			Max. Vx	2	0.742	0.031	0.220	
			Diagonal	Max Tension	25	2.404	0.000	0.000
				Max. Compression	12	-2.541	0.000	0.000
				Max. Mx	24	2.383	0.018	-0.003
Max. My	12	2.382		0.017	0.003			
Max. Vy	38	-0.013		0.017	-0.001			
Max. Vx	12	0.001		0.000	0.000			
T3	160 - 140	Leg	Max Tension	7	39.132	-0.430	-0.014	
			Max. Compression	10	-50.875	0.434	0.005	
			Max. Mx	14	34.046	0.617	0.015	
			Max. My	20	-5.438	-0.014	0.724	
			Max. Vy	14	-0.988	-0.442	0.006	
			Max. Vx	8	0.960	-0.032	0.237	
		Diagonal	Max Tension	13	4.093	0.000	0.000	
			Max. Compression	12	-4.185	0.000	0.000	
			Max. Mx	10	2.878	0.025	0.002	
			Max. My	12	-3.707	-0.006	0.004	
			Max. Vy	31	-0.015	0.018	-0.001	
			Max. Vx	12	-0.001	0.000	0.000	
T4	140 - 120	Leg	Max Tension	7	70.538	-0.384	-0.002	
			Max. Compression	10	-86.277	0.355	-0.002	
			Max. Mx	22	46.157	-0.531	-0.007	
			Max. My	4	-7.306	-0.052	-0.564	
			Max. Vy	22	-0.140	-0.340	-0.013	
			Max. Vx	16	0.164	-0.017	0.350	
		Diagonal	Max Tension	12	4.965	0.000	0.000	
			Max. Compression	12	-4.998	0.000	0.000	
			Max. Mx	10	3.515	0.027	0.002	
			Max. My	34	-0.830	0.022	0.003	
			Max. Vy	29	0.020	0.022	0.003	
			Max. Vx	34	-0.001	0.000	0.000	
T5	120 - 100	Leg	Max Tension	7	98.505	-0.340	-0.077	
			Max. Compression	18	-118.080	0.446	0.090	
			Max. Mx	2	-113.067	0.456	-0.037	
			Max. My	17	-8.437	0.006	0.542	
			Max. Vy	3	-0.108	0.455	-0.038	
			Max. Vx	4	-0.187	-0.033	-0.480	
		Diagonal	Max Tension	20	4.774	0.000	0.000	
			Max. Compression	20	-4.826	0.000	0.000	
			Max. Mx	18	3.695	0.041	0.003	
			Max. My	34	1.106	0.035	0.005	
			Max. Vy	31	-0.027	0.041	-0.004	
			Max. Vx	34	-0.002	0.000	0.000	
T6	100 - 80	Leg	Max Tension	7	124.111	-0.457	-0.015	
			Max. Compression	18	-149.730	0.815	0.046	
			Max. Mx	18	-149.730	0.815	0.046	
			Max. My	4	-13.723	0.009	-0.670	
			Max. Vy	22	-0.571	-0.545	-0.023	
			Max. Vx	5	-0.514	-0.009	-0.410	
		Diagonal	Max Tension	20	5.628	0.000	0.000	
			Max. Compression	20	-5.626	0.000	0.000	
			Max. Mx	31	1.402	0.049	0.006	
			Max. My	29	-1.241	0.040	-0.007	
			Max. Vy	29	0.035	0.048	-0.006	
			Max. Vx	29	0.002	0.000	0.000	

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
T7	80 - 60	Leg	Max Tension	7	147.409	-0.684	-0.040			
			Max. Compression	18	-176.643	1.077	0.073			
			Max. Mx	18	-176.643	1.077	0.073			
			Max. My	4	-14.544	-0.094	-1.050			
			Max. Vy	18	-0.122	1.077	0.073			
			Max. Vx	4	0.152	-0.094	-1.050			
		Diagonal	Max Tension	20	6.577	0.000	0.000			
			Max. Compression	20	-6.621	0.000	0.000			
			Max. Mx	31	1.589	0.085	0.011			
			Max. My	34	1.767	0.082	0.012			
			Max. Vy	29	0.047	0.083	-0.012			
			Max. Vx	34	-0.003	0.000	0.000			
			T8	60 - 40	Leg	Max Tension	7	171.416	-0.914	-0.038
						Max. Compression	18	-205.129	-0.131	0.031
Max. Mx	18	-190.596				1.077	0.073			
Max. My	4	-17.243				-0.076	-0.950			
Max. Vy	22	-0.172				-0.916	-0.027			
Max. Vx	4	0.129				-0.076	-0.950			
Diagonal	Max Tension	20			6.957	0.000	0.000			
	Max. Compression	20			-7.020	0.000	0.000			
T9	40 - 20	Leg	Max Tension	7	193.560	1.474	-0.019			
			Max. Compression	18	-231.968	-0.409	0.030			
			Max. Mx	18	-218.295	3.275	-0.011			
			Max. My	8	-17.769	-0.436	1.895			
			Max. Vy	18	-1.157	3.210	-0.013			
			Max. Vx	4	0.468	-0.450	-1.851			
		Diagonal	Max Tension	21	7.263	0.101	-0.002			
			Max. Compression	18	-8.096	0.000	0.000			
			Max. Mx	31	0.986	0.160	-0.011			
			Max. My	18	-7.632	0.014	0.015			
			Max. Vy	29	0.069	0.130	-0.011			
			Max. Vx	28	-0.003	0.000	0.000			
			Secondary Horizontal	Max Tension	8	1.227	0.058	0.004		
				Max. Compression	9	-1.010	0.051	0.020		
Max. Mx	36	0.014		0.135	0.027					
Max. My	30	0.259		0.102	0.029					
Max. Vy	36	-0.072		0.135	0.027					
Max. Vx	30	-0.005		0.000	0.000					
T10	20 - 0	Leg	Max Tension	7	215.316	-1.690	-0.031			
			Max. Compression	18	-259.457	0.000	-0.000			
			Max. Mx	35	-104.782	4.096	-0.018			
			Max. My	8	-21.093	-0.151	2.367			
			Max. Vy	31	-0.728	-3.078	-0.000			
			Max. Vx	4	-0.337	-0.155	-2.319			
		Diagonal	Max Tension	20	7.751	0.000	0.000			
			Max. Compression	18	-8.317	0.000	0.000			
			Max. Mx	29	0.003	0.206	-0.021			
			Max. My	28	3.707	0.123	-0.025			
			Max. Vy	29	0.080	0.206	-0.021			
			Max. Vx	28	0.004	0.000	0.000			

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	266.248	23.612	-12.906
	Max. H _x	18	266.248	23.612	-12.906
	Max. H _z	7	-220.627	-20.221	11.005
	Min. Vert	7	-220.627	-20.221	11.005

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg B	Min. H _x	7	-220.627	-20.221	11.005
	Min. H _z	18	266.248	23.612	-12.906
	Max. Vert	10	259.861	-22.223	-13.054
	Max. H _x	23	-209.339	18.788	11.053
	Max. H _z	23	-209.339	18.788	11.053
Leg A	Min. Vert	23	-209.339	18.788	11.053
	Min. H _x	10	259.861	-22.223	-13.054
	Min. H _z	10	259.861	-22.223	-13.054
	Max. Vert	2	249.952	0.467	24.861
	Max. H _x	20	22.621	2.438	1.682
	Max. H _z	2	249.952	0.467	24.861
	Min. Vert	15	-202.529	-0.423	-20.911
	Min. H _x	9	16.468	-2.381	1.212
	Min. H _z	15	-202.529	-0.423	-20.911

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	57.266	0.000	0.000	5.801	-23.340	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	68.719	-0.044	-38.405	-3932.546	-23.442	15.074
0.9 Dead+1.0 Wind 0 deg - No Ice	51.540	-0.044	-38.405	-3934.287	-16.440	15.074
1.2 Dead+1.0 Wind 30 deg - No Ice	68.719	19.074	-33.375	-3420.682	-1985.425	25.892
0.9 Dead+1.0 Wind 30 deg - No Ice	51.540	19.074	-33.375	-3422.422	-1978.423	25.892
1.2 Dead+1.0 Wind 60 deg - No Ice	68.719	34.734	-20.253	-2061.614	-3571.870	20.933
0.9 Dead+1.0 Wind 60 deg - No Ice	51.540	34.734	-20.253	-2063.354	-3564.868	20.933
1.2 Dead+1.0 Wind 90 deg - No Ice	68.719	40.398	0.066	14.078	-4143.919	5.718
0.9 Dead+1.0 Wind 90 deg - No Ice	51.540	40.398	0.066	12.338	-4136.917	5.718
1.2 Dead+1.0 Wind 120 deg - No Ice	68.719	34.455	20.087	2061.219	-3549.048	-6.123
0.9 Dead+1.0 Wind 120 deg - No Ice	51.540	34.455	20.087	2059.478	-3542.046	-6.123
1.2 Dead+1.0 Wind 150 deg - No Ice	68.719	18.038	31.464	3290.368	-1909.474	-7.201
0.9 Dead+1.0 Wind 150 deg - No Ice	51.540	18.038	31.464	3288.628	-1902.472	-7.201
1.2 Dead+1.0 Wind 180 deg - No Ice	68.719	0.044	36.628	3807.204	-32.573	-15.330
0.9 Dead+1.0 Wind 180 deg - No Ice	51.540	0.044	36.628	3805.464	-25.571	-15.330
1.2 Dead+1.0 Wind 210 deg - No Ice	68.719	-19.062	33.324	3428.683	1928.043	-26.196
0.9 Dead+1.0 Wind 210 deg - No Ice	51.540	-19.062	33.324	3426.942	1935.045	-26.196
1.2 Dead+1.0 Wind 240 deg - No Ice	68.719	-36.244	21.069	2136.833	3633.131	-21.293
0.9 Dead+1.0 Wind 240 deg - No Ice	51.540	-36.244	21.069	2135.093	3640.133	-21.293
1.2 Dead+1.0 Wind 270 deg - No Ice	68.719	-40.398	-0.021	4.947	4087.904	-5.491
0.9 Dead+1.0 Wind 270 deg - No Ice	51.540	-40.398	-0.021	3.207	4094.906	-5.491
1.2 Dead+1.0 Wind 300 deg - No Ice	68.719	-32.945	-19.271	-1986.000	3375.757	5.996
0.9 Dead+1.0 Wind 300 deg - No Ice	51.540	-32.945	-19.271	-1987.740	3382.758	5.996

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 330 deg - No Ice	68.719	-18.050	-31.516	-3282.367	1854.826	6.978
0.9 Dead+1.0 Wind 330 deg - No Ice	51.540	-18.050	-31.516	-3284.107	1861.827	6.978
1.2 Dead+1.0 Ice+1.0 Temp	123.015	0.000	0.000	11.917	-67.157	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	123.015	-0.011	-10.600	-1080.058	-66.161	3.448
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	123.015	5.408	-9.451	-955.897	-620.789	6.833
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	123.015	9.838	-5.727	-569.758	-1065.530	5.896
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	123.015	11.497	0.015	13.434	-1233.877	1.514
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	123.015	9.628	5.607	585.365	-1051.554	-1.084
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	123.015	5.183	9.034	949.152	-604.703	-1.239
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	123.015	0.011	10.298	1080.771	-68.153	-3.500
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	123.015	-5.406	9.441	978.523	486.196	-6.895
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	123.015	-10.093	5.863	603.452	950.560	-5.970
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	123.015	-11.497	-0.006	11.442	1099.563	-1.468
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	123.015	-9.372	-5.471	-551.671	897.896	1.058
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	123.015	-5.186	-9.045	-926.526	470.668	1.194
Dead+Wind 0 deg - Service	57.266	-0.012	-10.952	-1110.216	-22.054	4.245
Dead+Wind 30 deg - Service	57.266	5.440	-9.517	-965.184	-577.874	7.284
Dead+Wind 60 deg - Service	57.266	9.900	-5.772	-580.037	-1027.054	5.881
Dead+Wind 90 deg - Service	57.266	11.513	0.019	7.805	-1189.035	1.594
Dead+Wind 120 deg - Service	57.266	9.821	5.725	587.608	-1020.627	-1.738
Dead+Wind 150 deg - Service	57.266	5.148	8.979	936.167	-556.485	-2.036
Dead+Wind 180 deg - Service	57.266	0.012	10.452	1082.599	-24.625	-4.317
Dead+Wind 210 deg - Service	57.266	-5.436	9.503	975.119	530.810	-7.369
Dead+Wind 240 deg - Service	57.266	-10.325	6.002	608.902	1013.403	-5.983
Dead+Wind 270 deg - Service	57.266	-11.513	-0.006	5.234	1142.356	-1.530
Dead+Wind 300 deg - Service	57.266	-9.396	-5.495	-558.743	940.921	1.702
Dead+Wind 330 deg - Service	57.266	-5.152	-8.994	-926.232	510.190	1.973

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-57.266	0.000	-0.000	57.266	0.000	0.000%
2	-0.044	-68.719	-38.405	0.044	68.719	38.405	0.000%
3	-0.044	-51.540	-38.405	0.044	51.540	38.405	0.000%
4	19.074	-68.719	-33.375	-19.074	68.719	33.375	0.000%
5	19.074	-51.540	-33.375	-19.074	51.540	33.375	0.000%
6	34.734	-68.719	-20.253	-34.734	68.719	20.253	0.000%
7	34.734	-51.540	-20.253	-34.734	51.540	20.253	0.000%
8	40.398	-68.719	0.066	-40.398	68.719	-0.066	0.000%
9	40.398	-51.540	0.066	-40.398	51.540	-0.066	0.000%
10	34.455	-68.719	20.087	-34.455	68.719	-20.087	0.000%
11	34.455	-51.540	20.087	-34.455	51.540	-20.087	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
12	18.038	-68.719	31.464	-18.038	68.719	-31.464	0.000%
13	18.038	-51.540	31.464	-18.038	51.540	-31.464	0.000%
14	0.044	-68.719	36.628	-0.044	68.719	-36.628	0.000%
15	0.044	-51.540	36.628	-0.044	51.540	-36.628	0.000%
16	-19.062	-68.719	33.324	19.062	68.719	-33.324	0.000%
17	-19.062	-51.540	33.324	19.062	51.540	-33.324	0.000%
18	-36.244	-68.719	21.069	36.244	68.719	-21.069	0.000%
19	-36.244	-51.540	21.069	36.244	51.540	-21.069	0.000%
20	-40.398	-68.719	-0.021	40.398	68.719	0.021	0.000%
21	-40.398	-51.540	-0.021	40.398	51.540	0.021	0.000%
22	-32.945	-68.719	-19.271	32.945	68.719	19.271	0.000%
23	-32.945	-51.540	-19.271	32.945	51.540	19.271	0.000%
24	-18.050	-68.719	-31.516	18.050	68.719	31.516	0.000%
25	-18.050	-51.540	-31.516	18.050	51.540	31.516	0.000%
26	0.000	-123.015	0.000	-0.000	123.015	-0.000	0.000%
27	-0.011	-123.015	-10.600	0.011	123.015	10.600	0.000%
28	5.408	-123.015	-9.451	-5.408	123.015	9.451	0.000%
29	9.838	-123.015	-5.727	-9.838	123.015	5.727	0.000%
30	11.497	-123.015	0.015	-11.497	123.015	-0.015	0.000%
31	9.628	-123.015	5.607	-9.628	123.015	-5.607	0.000%
32	5.183	-123.015	9.034	-5.183	123.015	-9.034	0.000%
33	0.011	-123.015	10.298	-0.011	123.015	-10.298	0.000%
34	-5.406	-123.015	9.441	5.406	123.015	-9.441	0.000%
35	-10.093	-123.015	5.863	10.093	123.015	-5.863	0.000%
36	-11.497	-123.015	-0.006	11.497	123.015	0.006	0.000%
37	-9.372	-123.015	-5.471	9.372	123.015	5.471	0.000%
38	-5.186	-123.015	-9.045	5.186	123.015	9.045	0.000%
39	-0.012	-57.266	-10.952	0.012	57.266	10.952	0.000%
40	5.440	-57.266	-9.517	-5.440	57.266	9.517	0.000%
41	9.900	-57.266	-5.772	-9.900	57.266	5.772	0.000%
42	11.513	-57.266	0.019	-11.513	57.266	-0.019	0.000%
43	9.821	-57.266	5.725	-9.821	57.266	-5.725	0.000%
44	5.148	-57.266	8.979	-5.148	57.266	-8.979	0.000%
45	0.012	-57.266	10.452	-0.012	57.266	-10.452	0.000%
46	-5.436	-57.266	9.503	5.436	57.266	-9.503	0.000%
47	-10.325	-57.266	6.002	10.325	57.266	-6.002	0.000%
48	-11.513	-57.266	-0.006	11.513	57.266	0.006	0.000%
49	-9.396	-57.266	-5.495	9.396	57.266	5.495	0.000%
50	-5.152	-57.266	-8.994	5.152	57.266	8.994	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	4.923	42	0.262	0.025
T2	168 - 160	4.264	42	0.259	0.025
T3	160 - 140	3.831	42	0.248	0.025
T4	140 - 120	2.837	42	0.209	0.023
T5	120 - 100	2.016	42	0.167	0.019
T6	100 - 80	1.371	42	0.128	0.015
T7	80 - 60	0.866	47	0.099	0.011
T8	60 - 40	0.482	47	0.072	0.008
T9	40 - 20	0.216	47	0.045	0.005
T10	20 - 0	0.061	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
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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	42	4.813	0.263	0.025	390952
170.000	MX08FRO665-21 w/ Mount Pipe	42	4.373	0.261	0.025	185126
163.000	(2) BSF0020F3V1	42	3.992	0.253	0.025	56538
154.000	7770.00 w/ Mount Pipe	42	3.517	0.237	0.025	33923
145.000	800 EXTERNAL NOTCH FILTER	42	3.071	0.219	0.024	28277
143.000	AIR 6419 B41_TMO w/ Mount Pipe	42	2.976	0.215	0.023	27247
124.000	DS7C09P36UxD w/ Mount Pipe	42	2.166	0.176	0.020	26350
115.000	VHLP3-11W	42	1.840	0.157	0.018	28196
104.000	220-3BN	42	1.487	0.135	0.016	32729
93.000	APXVAARR24_43-U-NA20	42	1.180	0.117	0.014	37096
62.000	GPS_A	47	0.515	0.075	0.008	39475
60.000	(2) 3'x8" Knife Plate	47	0.482	0.072	0.008	39408
42.000	GPS_A	47	0.238	0.048	0.005	43280
31.000	GPS_A	47	0.133	0.032	0.004	42987
20.000	(2) 3'x8" Knife Plate	47	0.061	0.018	0.002	43859

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	17.426	19	0.920	0.089
T2	168 - 160	15.113	19	0.911	0.090
T3	160 - 140	13.592	19	0.874	0.090
T4	140 - 120	10.082	19	0.737	0.081
T5	120 - 100	7.175	19	0.593	0.067
T6	100 - 80	4.882	19	0.453	0.055
T7	80 - 60	3.088	19	0.350	0.040
T8	60 - 40	1.716	19	0.256	0.027
T9	40 - 20	0.767	19	0.160	0.018
T10	20 - 0	0.216	19	0.063	0.008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	19	17.040	0.921	0.089	125521
170.000	MX08FRO665-21 w/ Mount Pipe	19	15.497	0.915	0.089	58593
163.000	(2) BSF0020F3V1	19	14.158	0.890	0.090	17153
154.000	7770.00 w/ Mount Pipe	19	12.487	0.836	0.089	10121
145.000	800 EXTERNAL NOTCH FILTER	19	10.909	0.773	0.084	8092
143.000	AIR 6419 B41_TMO w/ Mount Pipe	19	10.574	0.759	0.083	7756
124.000	DS7C09P36UxD w/ Mount Pipe	19	7.705	0.622	0.070	7498
115.000	VHLP3-11W	19	6.548	0.556	0.064	8008
104.000	220-3BN	19	5.297	0.479	0.057	9257
93.000	APXVAARR24_43-U-NA20	19	4.203	0.414	0.049	10469
62.000	GPS_A	19	1.834	0.266	0.028	11092
60.000	(2) 3'x8" Knife Plate	19	1.716	0.256	0.027	11073
42.000	GPS_A	19	0.844	0.170	0.018	12243
31.000	GPS_A	19	0.470	0.114	0.013	12152
20.000	(2) 3'x8" Knife Plate	19	0.216	0.063	0.008	12376

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.625	1	0.737	7.875	0.094	1.05	Member Block Shear
		Top Girt	A325N	0.625	1	0.159	7.875	0.020	1.05	Member Block Shear
T2	168	Leg	A325N	0.625	4	1.984	20.340	0.098	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	2.404	7.875	0.305	1.05	Member Block Shear
T3	160	Leg	A325N	0.625	4	9.772	20.340	0.480	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.093	7.875	0.520	1.05	Member Block Shear
T4	140	Leg	A325N	0.750	4	17.634	30.101	0.586	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.965	7.875	0.630	1.05	Member Block Shear
T5	120	Leg	A325N	0.750	4	24.626	30.101	0.818	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.774	9.914	0.482	1.05	Member Block Shear
T6	100	Leg	A490N	0.875	4	31.028	51.945	0.597	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	5.628	9.914	0.568	1.05	Member Block Shear
T7	80	Leg	A325N	0.875	4	36.852	41.556	0.887	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6.577	10.934	0.602	1.05	Member Block Shear
T8	60	Leg	A325N	1.000	4	42.854	54.517	0.786	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7.020	13.806	0.509	1.05	Bolt Shear
T9	40	Leg	A325N	1.000	4	48.340	54.517	0.887	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	8.096	13.806	0.586	1.05	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	4.023	8.836	0.455	1.05	Bolt Shear
T10	20	Diagonal	A325N	0.625	1	8.317	13.806	0.602	1.05	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T1	180 - 168	P2x0.154	12.000	4.000	61.0 K=1.00	1.075	-3.663	27.981	0.131 ¹
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0 K=1.00	1.075	-12.586	38.430	0.328 ¹
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7 K=1.00	2.228	-50.875	87.013	0.585 ¹
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3 K=1.00	3.678	-86.277	122.133	0.706 ¹
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3 K=1.00	4.407	-118.080	157.190	0.751 ¹
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6 K=1.00	6.111	-149.730	242.262	0.618 ¹
T7	80 - 60	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-176.643	227.081	0.778 ¹
T8	60 - 40	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-205.129	227.081	0.903 ¹
T9	40 - 20	P6x0.432	20.033	5.151	28.2 K=1.00	8.405	-231.968	254.222	0.912 ¹
T10	20 - 0	P8x.5	20.033	10.017	41.8 K=1.00	12.763	-259.457	367.690	0.706 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 K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-0.833	15.177	0.055 ¹
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-2.541	15.177	0.167 ¹
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	135.6 K=1.00	0.621	-4.185	9.673	0.433 ¹
T4	140 - 120	L2x2x3/16	10.162	4.935	150.3 K=1.00	0.715	-4.587	9.058	0.506 ¹
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	160.2 K=1.00	0.809	-4.827	9.021	0.535 ¹
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	157.5 K=1.00	0.902	-5.591	10.402	0.538 ¹
T7	80 - 60	L3x3x3/16	16.803	8.223	165.6 K=1.00	1.090	-6.621	11.381	0.582 ¹
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	172.1 K=1.00	1.560	-7.020	15.083	0.465 ¹
T9	40 - 20	L3 1/2x3x1/4	20.158	9.903	188.3 K=1.00	1.560	-8.096	12.589	0.643 ¹
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.835	187.5 K=1.00	1.688	-8.317	13.745	0.605 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.486	16.642	183.2 K=1.00	1.690	-4.023	14.410	0.279 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 K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	130.8 K=1.00	0.621	-0.125	10.385	0.012 ¹

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	P2x0.154	12.000	4.000	61.0	1.075	1.607	33.848	0.047 ¹
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0	1.075	7.937	33.848	0.234 ¹
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7	2.228	39.087	70.197	0.557 ¹
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3	3.678	70.538	115.870	0.609 ¹
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3	4.407	98.505	138.834	0.710 ¹
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6	6.111	124.111	192.508	0.645 ¹
T7	80 - 60	P6x0.432	20.033	10.017	54.8	8.405	147.409	264.756	0.557 ¹
T8	60 - 40	P6x0.432	20.033	10.017	54.8	8.405	171.416	264.756	0.647 ¹
T9	40 - 20	P6x0.432	20.033	4.865	26.6	8.405	193.560	264.756	0.731 ¹
T10	20 - 0	P8x.5	20.033	10.017	41.8	12.763	215.316	402.026	0.536 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	0.737	15.675	0.047 ¹
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	2.404	15.675	0.153 ¹
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	103.3	0.360	4.093	15.675	0.261 ¹
T4	140 - 120	L2x2x3/16	9.197	4.474	89.9	0.431	4.965	18.739	0.265 ¹
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	117.0	0.501	4.774	21.806	0.219 ¹
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	102.5	0.571	5.628	24.840	0.227 ¹
T7	80 - 60	L3x3x3/16	16.803	8.223	107.0	0.712	6.577	30.973	0.212 ¹
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	120.8	1.029	6.957	44.778	0.155 ¹
T9	40 - 20	L3 1/2x3x1/4	20.158	9.903	132.1	1.029	7.263	44.778	0.162 ¹
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.835	119.1	1.125	7.751	48.938	0.158 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	16.485	15.641	175.4	1.150	4.023	50.039	0.080 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	103.8	0.360	0.159	15.675	0.010 ¹

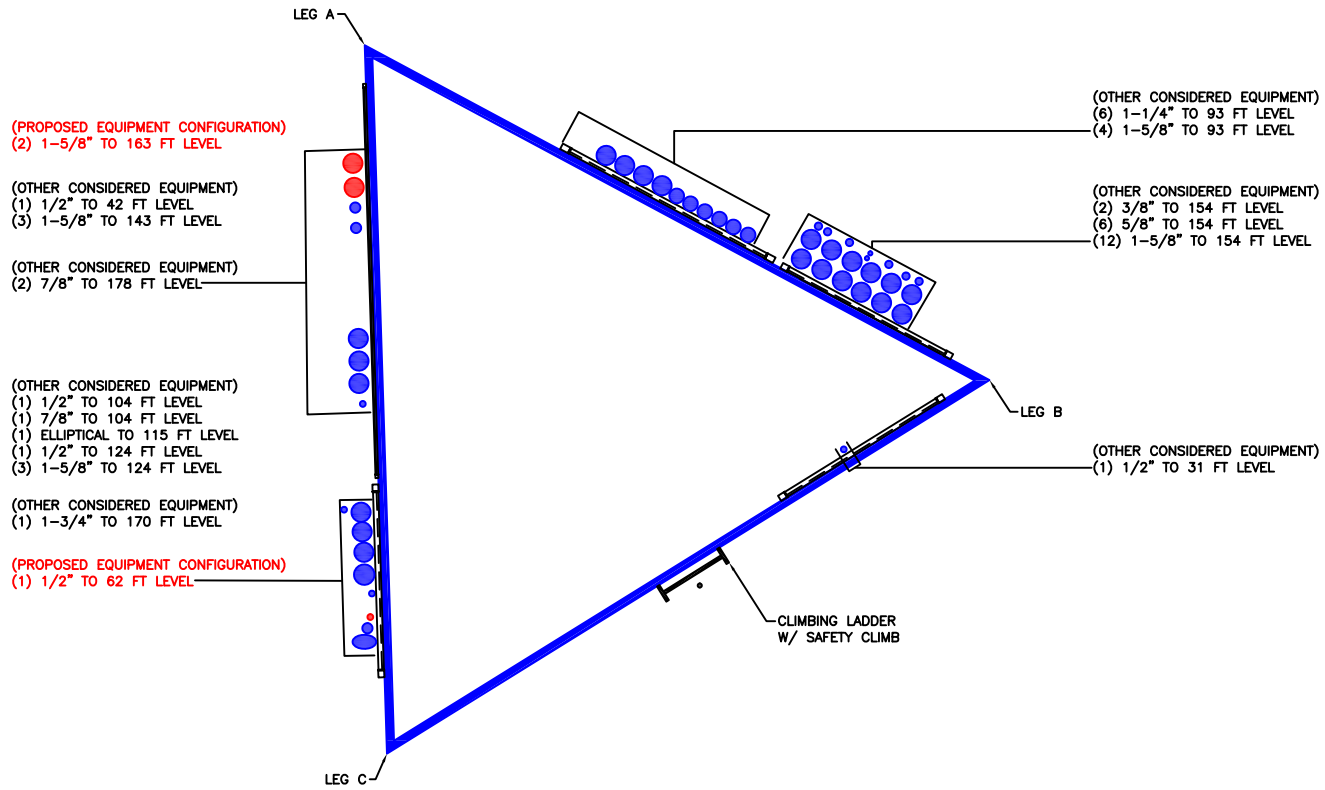
¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
T1	180 - 168	Leg	P2x0.154	2	-3.663	29.380	12.5	Pass	
T2	168 - 160	Leg	P2x0.154 (GR)	27	-12.586	40.351	31.2	Pass	
T3	160 - 140	Leg	P3x0.216 (GR)	41	-50.875	91.364	55.7	Pass	
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-86.277	128.240	67.3	Pass	
T5	120 - 100	Leg	P4x.337 (GR)	88	-118.080	165.049	71.5	Pass	
T6	100 - 80	Leg	P5x0.375 (GR)	109	124.111	202.133	61.4	Pass	
T7	80 - 60	Leg	P6x0.432	130	-176.643	238.435	74.1	Pass	
T8	60 - 40	Leg	P6x0.432	145	-205.129	238.435	86.0	Pass	
T9	40 - 20	Leg	P6x0.432	160	-231.968	266.933	86.9	Pass	
T10	20 - 0	Leg	P8x.5	181	-259.457	386.074	67.2	Pass	
T1	180 - 168	Diagonal	L2x1 1/2x3/16	9	-0.833	15.935	5.2	Pass	
T2	168 - 160	Diagonal	L2x1 1/2x3/16	30	-2.541	15.935	15.9	Pass	
T3	160 - 140	Diagonal	L2x1 1/2x3/16	45	-4.185	10.157	41.2	Pass	
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.587	9.511	48.2	Pass	
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-4.827	9.472	51.0	Pass	
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-5.591	10.923	51.2	Pass	
T7	80 - 60	Diagonal	L3x3x3/16	133	-6.621	11.950	55.4	Pass	
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.020	15.837	44.3	Pass	
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.096	13.218	61.3	Pass	
T10	20 - 0	Diagonal	L3 1/2x3 /12x1/4	184	-8.317	14.432	57.6	Pass	
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	171	-4.023	15.131	26.6	Pass	
T1	180 - 168	Top Girt	L2x1 1/2x3/16	4	-0.125	10.904	1.1	Pass	
							Summary		
							Leg (T9)	86.9	Pass
							Diagonal (T9)	61.3	Pass
							Secondary Horizontal (T9)	26.6	Pass
							Top Girt (T1)	1.1	Pass
							Bolt	84.5	Pass
							Checks		
							RATING =	86.9	Pass

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

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity



Site Info	
BU #	806353
Site Name	BRG 124 943066
Order #	654635 Rev 1

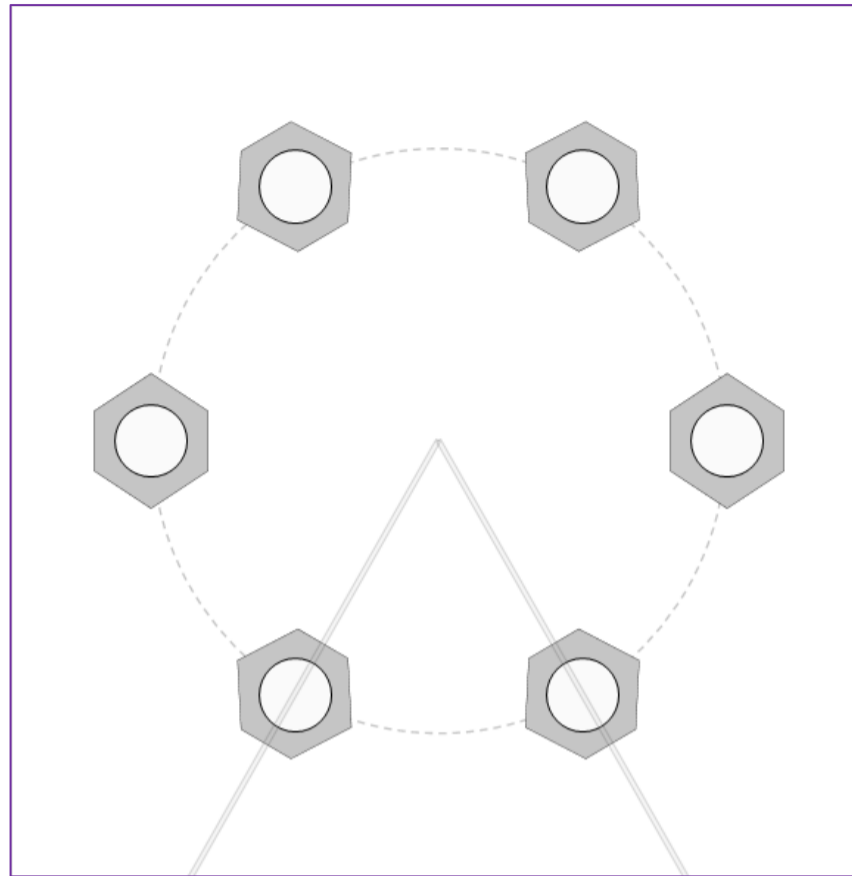
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	2

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	266.25	220.63
Shear Force (kips)	26.91	23.02

*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

*Anchor Rod Eccentricity Applied



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

Anchor Rod Data	
(6) 1-1/2" ϕ bolts (A36 N; $F_y=36$ ksi, $F_u=58$ ksi)	
l_{ar} (in):	2

Anchor Rod Summary			<i>(units of kips, kip-in)</i>
P_{u_t} = 36.77	ϕP_{n_t} = 61.34	Stress Rating	
V_u = 3.84	ϕV_n = 38.44	57.1%	
M_u = n/a	ϕM_n = n/a	Pass	

Drilled Pier Foundation

BU # :	806353
Site Name:	BRG 124 943066
Order Number:	654635 Rev 1
TIA-222 Revision:	H
Tower Type:	Self Support



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	266.25	220.63
Shear Force (kips)	26.91	23.02

Material Properties		
Concrete Strength, f _c :	3	ksi
Rebar Strength, F _y :	60	ksi
Tie Yield Strength, F _{yt} :	40	ksi

Pier Design Data		
Depth	13.2	ft
Ext. Above Grade	0.3	ft
Pier Section 1		
<i>From 0.3' above grade to 13.2' below grade</i>		
Pier Diameter	2.5	ft
Rebar Quantity	14	
Rebar Size	8	
Clear Cover to Ties	4	in
Tie Size	4	
Tie Spacing	16	in

Rebar 2, F _y Override (ksi)	Rebar 3, F _y Override (ksi)

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results

Soil Lateral Check	Compression	Uplift
D _{v=0} (ft from TOC)	7.45	7.45
Soil Safety Factor	8.43	9.85
Max Moment (kip-ft)	173.59	148.49
Rating*	15.0%	12.9%

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	191.24	191.24
End Bearing (kips)	206.28	-
Weight of Concrete (kips)	11.93	8.95
Total Capacity (kips)	397.52	267.34
Axial (kips)	367.71	220.63
Rating*	88.1%	78.6%

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	7.46	7.07
Critical Moment (kip-ft)	173.59	147.33
Critical Moment Capacity	505.89	357.59
Rating*	32.7%	39.2%

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	10.48	10.48
Critical Shear (kip)	57.40	49.11
Critical Shear Capacity	126.51	53.58
Rating*	43.2%	87.3%

Tie Spacing Requirements Not Met

Structural Foundation Rating*	87.3%
Soil Interaction Rating*	88.1%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile			
Groundwater Depth	N/A	# of Layers	3

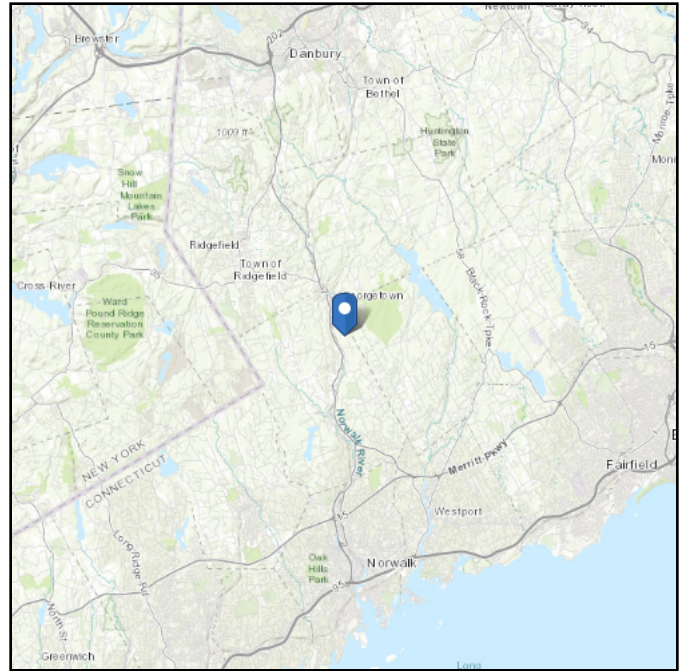
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	110	150	0	28	0.000	0.000	0.00	0.00			Cohesionless
2	5	6	1	110	150	0	30	0.000	0.000	0.77	0.77			Cohesionless
3	6	13.2	7.2	140	150	8	0	3.600	3.600	4.40	4.40	56.03		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 41.238528
Longitude: -73.424139
Elevation: 0 ft (NAVD 88)



Wind

Results:

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

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

Date Accessed: Wed Mar 01 2023

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

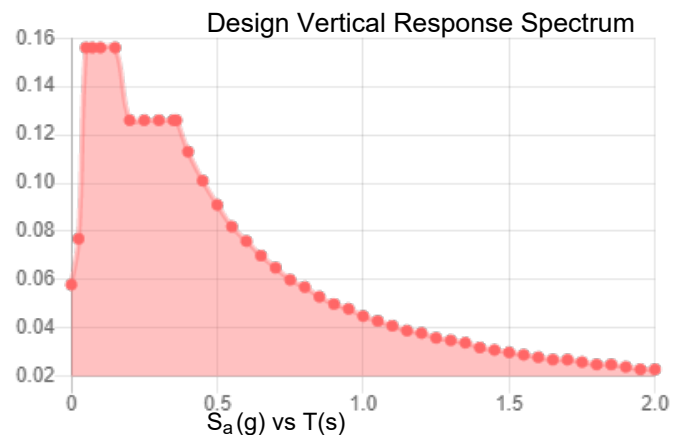
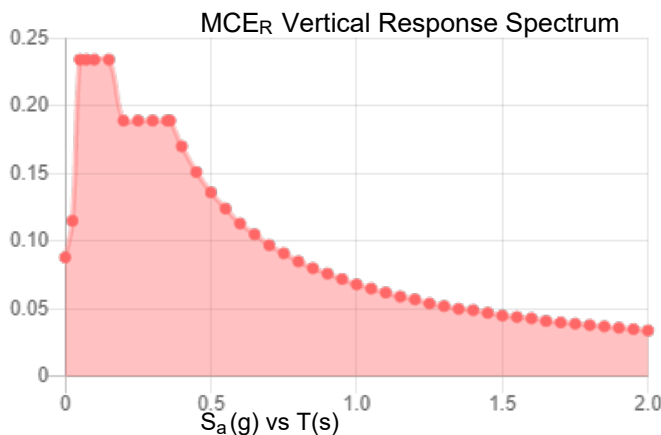
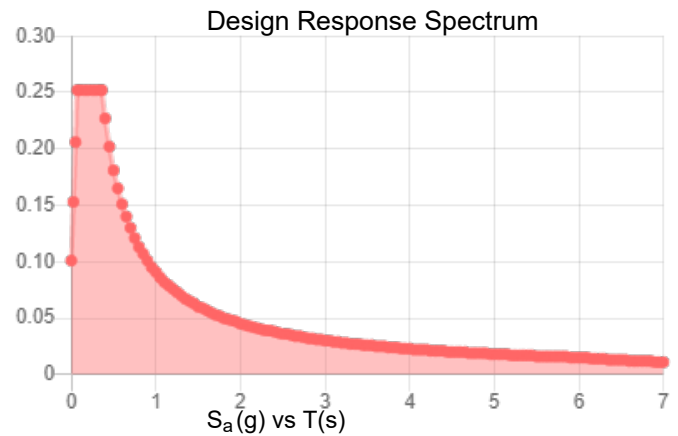
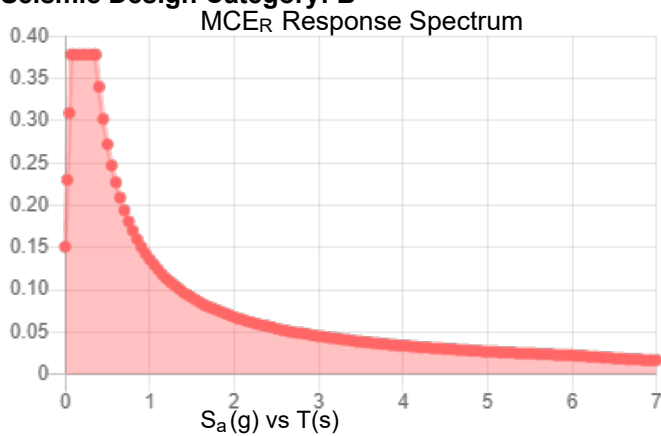
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class:

Results:

S_s :	0.236	S_{D1} :	0.091
S_1 :	0.057	T_L :	6
F_a :	1.6	PGA :	0.139
F_v :	2.4	PGA _M :	0.211
S_{MS} :	0.378	F_{PGA} :	1.523
S_{M1} :	0.136	I_e :	1
S_{DS} :	0.252	C_v :	0.773

Seismic Design Category: B



Data Accessed:

Wed Mar 01 2023

Date Source:

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

Ice

Results:

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

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

Date Accessed: Wed Mar 01 2023

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

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

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