



Date: **February 09, 2022**

Joel Rousseau
NexTower Development Group, on behalf of T-Mobile
13577 NW 2nd Lane, Suite 20
Newberry, FL 32669

SMW Engineering Group, Inc.
158 Business Center Drive
Birmingham, AL 35244
(205) 252-6985

Subject: **Structural Analysis Report**

Carrier Designation: **T-Mobile**
Carrier Site Number: 9JK1918A
Carrier Site Name: White Springs

NexTower Development Designation: **NexTower Development Site Number:** NXFL-147
NexTower Development Site Name: SW Hwy 47

Engineering Firm Designation: **SMW Engineering Group, Inc. Project Number:** 17-5641.2

Site Data: **26972 North US Hwy 441, White Springs, FL 32096 (Columbia County)**
Latitude 30.569°, Longitude -82.681°
250 Foot - Self Support Tower

Dear Joel Rousseau,

SMW Engineering Group, Inc. is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

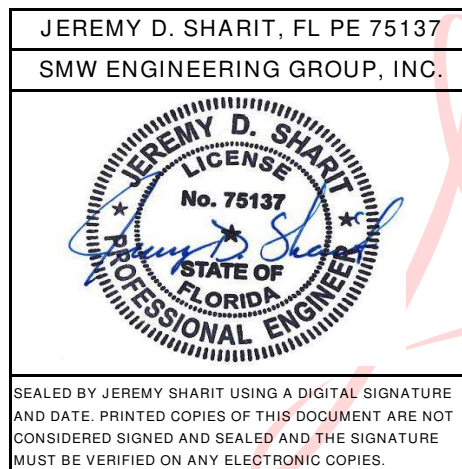
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

Proposed Equipment Configuration

Sufficient Capacity

The analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2020 Florida Building Code, 7th Edition. Applicable standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:



Jeremy D. Sharit, P.E.
Project Engineer
FL CA #33693

Digitally signed by
Jeremy D. Sharit
Location: FL PE
lic# 75137
Date: 2022.02.09
09:14:17 -06'00'

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 250 ft Self Support tower designed by World Tower.

2) ANALYSIS CRITERIA

Building Code:	2020 Florida Building Code, 7 th Edition
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	0.25 in
Wind Speed with Ice:	30 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)
245.0	245.0	3	Commscope	FFVV-65C-R3-V1 w/ Mount Pipe	3	1.996 Hybrid
		3	Ericsson	Radio 4480 B71+B85		

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)
250.0	252.0	1	-	Lightning Rod	-	-
	251.0	1	-	Flash Beacon Lighting		
245.0	245.0	3	-	Pipe Mount	-	-
		3	Sabre	C10857001C Mount		
230.0	230.0	1	-	Pipe Mount	1	1-5/8
		1	Ceragon	IP20B ODU		
		1	RFS	SB6-W60C MW Dish		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Manufacturer Drawings	World Tower	Dated 11/18/16	T-Mobile
RFDS	T-Mobile	Dated 12/29/21	NexTower Development
Geotechnical Report	Trileaf	Dated 01/18/16	T-Mobile
Structural Analysis	SMW Engineering Group, Inc.	Dated 09/02/20	SMW Engineering Group, Inc.

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 built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) 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. SMW Engineering Group, Inc. 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	250 - 240	Leg	1 1/2	1	-4.11	39.03	10.5	Pass
T2	240 - 220	Leg	2	28	-26.90	91.64	29.4	Pass
T3	220 - 200	Leg	P5x.258	78	-46.43	179.55	25.9	Pass
T4	200 - 180	Leg	P6x.28	108	-64.46	238.36	27.0	Pass
T5	180 - 160	Leg	P8x0.25	135	-82.48	287.23	28.7	Pass
T6	160 - 140	Leg	P8x.322	162	-101.47	366.59	27.7	Pass
T7	140 - 120	Leg	P10x.365	189	-118.47	495.59	23.9	Pass
T8	120 - 100	Leg	P10x.365	204	-138.62	495.59	28.0	Pass
T9	100 - 80	Leg	P10x.365	219	-159.43	495.59	32.2	Pass
T10	80 - 60	Leg	P12x.375	234	-180.86	620.91	29.1	Pass
T11	60 - 40	Leg	P12x.375	249	-199.19	620.86	32.1	Pass
T12	40 - 20	Leg	P12x.375	264	-216.28	620.86	34.8	Pass
T13	20 - 0	Leg	P12x.375	279	-233.00	620.86	37.5	Pass
T1	250 - 240	Diagonal	1	12	-2.84	6.57	43.3	Pass
T2	240 - 220	Diagonal	1 1/4	39	-5.42	15.87	34.2	Pass
T3	220 - 200	Diagonal	L2x2x3/16	104	-2.61	17.55	14.9	Pass
T4	200 - 180	Diagonal	L2x2x3/16	113	-2.28	13.81	16.5	Pass
T5	180 - 160	Diagonal	L2x2x1/4	140	-2.66	14.78	18.0	Pass
T6	160 - 140	Diagonal	L2x2x1/4	167	-2.84	11.87	24.0	Pass
T7	140 - 120	Diagonal	L3x3x3/16	194	-4.18	16.38	25.5	Pass
T8	120 - 100	Diagonal	L3x3x3/16	210	-4.53	14.43	31.4	Pass
T9	100 - 80	Diagonal	L3x3x1/4	225	-4.93	16.65	29.6	Pass
T10	80 - 60	Diagonal	L3x3x3/8	240	-5.72	21.72	26.3	Pass
T11	60 - 40	Diagonal	L3x3x1/4	255	-4.47	12.82	34.9	Pass
T12	40 - 20	Diagonal	L3x3x3/8	270	-5.05	15.98	31.6	Pass
T13	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	285	-6.07	14.81	41.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	250 - 240	Horizontal	1	16	-0.73	10.42	7.0	Pass
T2	240 - 220	Horizontal	1	57	-0.68	10.63	6.4	Pass
T1	250 - 240	Secondary Horizontal	1	13	-0.00	17.56	0.0	Pass
T2	240 - 220	Secondary Horizontal	1	40	-0.00	17.59	0.0	Pass
T1	250 - 240	Top Girt	1 1/8	4	-0.05	15.91	0.3	Pass
T2	240 - 220	Top Girt	1 1/8	33	-1.29	16.15	8.0	Pass
T3	220 - 200	Top Girt	L2x2x1/8	80	-0.80	10.27	7.8	Pass
T1	250 - 240	Bottom Girt	1	9	-1.18	10.42	11.3	Pass
T2	240 - 220	Bottom Girt	1	36	-1.50	10.63	14.2	Pass
							Summary	
						Leg (T13)	37.5	Pass
						Diagonal (T1)	43.3	Pass
						Horizontal (T1)	7.0	Pass
						Secondary Horizontal (T1)	0.0	Pass
						Top Girt (T2)	8.0	Pass
						Bottom Girt (T2)	14.2	Pass
						Rating =	43.3	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	23.7	Pass
1	Base Foundation (Structure)	0	4.4	Pass
1	Base Foundation (Soil Interaction)	0	56.6	Pass

Structure Rating (max from all components) =	56.6%
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Notes:

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

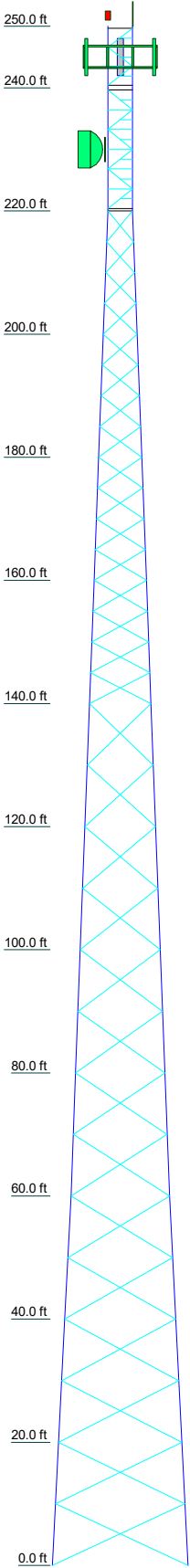
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	
Legs	SR 1 1/2	SR 2	P5x.258	P6x.28	P8x0.25	P8x.322		P10x.365			P12x.375			
Leg Grade	A572-50							A500-50						
Diagonals	SR 1 1/4		L2x2x3/16				L3x3x3/16		L3x3x1/4	L3x3x3/8	L3x3x1/4	L3x3x3/8	L3 1/2x3 1/2x1/4	
Diagonal Grade							A36							
Top Girts		SR 1 1/8												
Bottom Girts		SR 1						N.A.						
Horizontals		SR 1						N.A.						
Sec. Horizontals		SR 1						N.A.						
Face Width (ft)	4		5.5	7	8.5	10	11.5	13	14.5	16	18	20	22	
# Panels @ (ft)	6 @ 3.20833		16 @ 5											
Weight (K)	0.5	1.3	1.3	1.6	2.1	2.5	3.1	3.1	3.4	4.6	4.1	4.6	4.6	37.0



ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 237 K
SHEAR: 22 K

UPLIFT: -194 K
SHEAR: 18 K

AXIAL
59 K

SHEAR
3 K

MOMENT
367 kip-ft

TORQUE 2 kip-ft
30 mph WIND - 0.2500 in ICE

AXIAL
52 K

SHEAR
33 K

MOMENT
4190 kip-ft

TORQUE 23 kip-ft
REACTIONS - 115 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	250	Pipe Mount	245
Flash Beacon Lighting	250	Pipe Mount	245
FFVV-65C-R3-V1 w/ Mount Pipe	245	Pipe Mount	245
FFVV-65C-R3-V1 w/ Mount Pipe	245	C10857001C Mount [3]	245
FFVV-65C-R3-V1 w/ Mount Pipe	245	IP20B ODU	230
Radio 4480 B71+B85	245	Pipe Mount	230
Radio 4480 B71+B85	245	SB6-W60C	230
Radio 4480 B71+B85	245		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A500-50	50 ksi	62 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Columbia County, Florida.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 30 mph basic wind with 0.25 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: 43.3%



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Job:	9JK1918A		
Project:	17-5641.2		
Client:	NexTower Development	Drawn by:	Justin Roberson
Code:	TIA-222-H	Date:	02/09/22
Path:		Scale:	NTS
		Dwg No.	E-1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 250.00 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 4.00 ft at the top and 22.00 ft at the base.

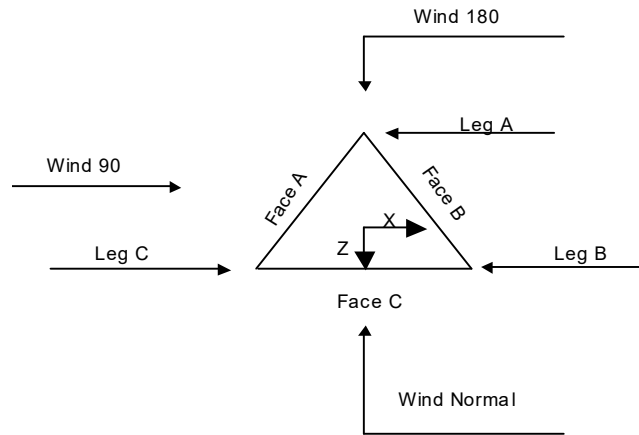
This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower is located in Columbia County, Florida.
- Tower base elevation above sea level: 125.00 ft.
- Basic wind speed of 115 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 0.2500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 30 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.
- 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.
- 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.
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Exemption
Leg Bolts Are At Top Of Section		Use TIA-222-H Tension Splice
√ Secondary Horizontal Braces Leg	Add IBC .6D+W Combination	Exemption
Use Diamond Inner Bracing (4 Sided)	√ Sort Capacity Reports By Component	Poles
√ SR Members Have Cut Ends	Triangulate Diamond Inner Bracing	Include Shear-Torsion Interaction
SR Members Are Concentric	Treat Feed Line Bundles As Cylinder	Always Use Sub-Critical Flow
	Ignore KL/ry For 60 Deg. Angle Legs	Use Top Mounted Sockets
		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	250.00-240.00			4.00	1	10.00
T2	240.00-220.00			4.00	1	20.00
T3	220.00-200.00			4.00	1	20.00
T4	200.00-180.00			5.50	1	20.00
T5	180.00-160.00			7.00	1	20.00
T6	160.00-140.00			8.50	1	20.00
T7	140.00-120.00			10.00	1	20.00
T8	120.00-100.00			11.50	1	20.00
T9	100.00-80.00			13.00	1	20.00
T10	80.00-60.00			14.50	1	20.00
T11	60.00-40.00			16.00	1	20.00
T12	40.00-20.00			18.00	1	20.00
T13	20.00-0.00			20.00	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	250.00-240.00	3.08	K Brace Left	No	Yes+Steps	4.5000	4.5000
T2	240.00-220.00	3.21	K Brace Left	No	Yes+Steps	4.5000	4.5000
T3	220.00-200.00	5.00	X Brace	No	No	0.0000	0.0000
T4	200.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T5	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T6	160.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T7	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T8	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T9	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T10	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000

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
T11	60.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	40.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	20.00-0.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 250.00-240.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T2 240.00-220.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T3 220.00-200.00	Pipe	P5x.258	A500-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 200.00-180.00	Pipe	P6x.28	A500-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 180.00-160.00	Pipe	P8x0.25	A500-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 160.00-140.00	Pipe	P8x.322	A500-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T7 140.00-120.00	Pipe	P10x.365	A500-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 120.00-100.00	Pipe	P10x.365	A500-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 100.00-80.00	Pipe	P10x.365	A500-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T10 80.00-60.00	Pipe	P12x.375	A500-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T11 60.00-40.00	Pipe	P12x.375	A500-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T12 40.00-20.00	Pipe	P12x.375	A500-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T13 20.00-0.00	Pipe	P12x.375	A500-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	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 250.00-240.00	Solid Round	1 1/8	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T2 240.00-220.00	Solid Round	1 1/8	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T3 220.00-200.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 250.00-240.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 240.00-220.00	None	Equal Angle		A36 (36 ksi)	Solid Round	1	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
T1 250.00-240.00	Solid Round	1	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 240.00-220.00	Solid Round	1	A36 (36 ksi)	Solid Round		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 _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
T1 250.00-240.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 240.00-220.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 220.00-200.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 200.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry (cont'd)

K Factors¹

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	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
ft										
T1 250.00-240.00	Yes	Yes	1	1	1	1	1	1	1	1
T2 240.00-220.00	Yes	Yes	1	1	1	1	1	1	1	1
T3 220.00-200.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 200.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1
T5 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1
T6 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1
T10 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1
T11 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1
T12 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
T13 20.00-0.00	Yes	Yes	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 250.00-240.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75	0.0000	1
T2 240.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 220.00-200.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 200.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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
T13 20.00- 0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	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 250.00- 240.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 240.00- 220.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 220.00- 200.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 200.00- 180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 180.00- 160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 160.00- 140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 140.00- 120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 120.00- 100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 100.00- 80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.00- 60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 60.00- 40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 40.00- 20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 20.00- 0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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
Step Bolts	A	No	No	Ar (CaAa)	250.00 - 0.00	2.0000	0.5	1	1	0.2500	0.1500		0.31
Safety Line	B	No	No	Ar (CaAa)	250.00 - 0.00	3.0000	-0.5	1	1	0.3750	0.3750		0.22
Feedline Ladder (Af) ***	A	No	No	Af (CaAa)	245.00 - 0.00	0.0000	0.35	1	1	3.0000	2.0000		8.40
1.996 Hybrid (T-Mobile) ***	A	No	No	Ar (CaAa)	245.00 - 0.00	0.0000	0.38	3	3	1.5500	1.5500		1.71
1-5/8 MW Coax (T-Mobile)	A	No	No	Ar (CaAa)	245.00 - 0.00	0.0000	0.33	1	1	1.9800	1.9800		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	250.00-240.00	A	0.000	0.000	5.132	0.000	0.08
		B	0.000	0.000	0.375	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	240.00-220.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	220.00-200.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T4	200.00-180.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T5	180.00-160.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T6	160.00-140.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T7	140.00-120.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T8	120.00-100.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T9	100.00-80.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T10	80.00-60.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T11	60.00-40.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T12	40.00-20.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T13	20.00-0.00	A	0.000	0.000	20.227	0.000	0.30
		B	0.000	0.000	0.750	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	250.00-240.00	A	0.260	0.000	0.000	6.949	0.000	0.10
		B		0.000	0.000	0.894	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	240.00-220.00	A	0.258	0.000	0.000	26.420	0.000	0.37
		B		0.000	0.000	1.782	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T3	220.00-200.00	A	0.256	0.000	0.000	26.363	0.000	0.37
		B		0.000	0.000	1.773	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T4	200.00-180.00	A	0.253	0.000	0.000	26.302	0.000	0.37
		B		0.000	0.000	1.763	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T5	180.00-160.00	A	0.250	0.000	0.000	26.235	0.000	0.37
		B		0.000	0.000	1.751	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
T6	160.00-140.00	A	0.247	0.000	0.000	26.160	0.000	0.37
		B		0.000	0.000	1.739	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
T7	140.00-120.00	C	0.244	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	26.076	0.000	0.37
		B		0.000	0.000	1.725	0.000	0.01
T8	120.00-100.00	C	0.240	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	25.979	0.000	0.37
		B		0.000	0.000	1.709	0.000	0.01
T9	100.00-80.00	C	0.235	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	25.865	0.000	0.37
		B		0.000	0.000	1.690	0.000	0.01
T10	80.00-60.00	C	0.229	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	25.725	0.000	0.36
		B		0.000	0.000	1.666	0.000	0.01
T11	60.00-40.00	C	0.222	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	25.543	0.000	0.36
		B		0.000	0.000	1.636	0.000	0.01
T12	40.00-20.00	C	0.210	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	25.278	0.000	0.36
		B		0.000	0.000	1.592	0.000	0.01
T13	20.00-0.00	C	0.189	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	24.753	0.000	0.35
		B		0.000	0.000	1.504	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
T1	250.00-240.00	-0.9989	-6.1940	-0.8605	-6.6979
T2	240.00-220.00	-1.5238	-8.6432	-1.3964	-9.1290
T3	220.00-200.00	-0.9922	-6.2165	-0.9861	-7.0773
T4	200.00-180.00	-1.1294	-7.4136	-1.0888	-8.1691
T5	180.00-160.00	-1.1530	-7.7823	-1.1101	-8.5672
T6	160.00-140.00	-1.2523	-8.6846	-1.2003	-9.4883
T7	140.00-120.00	-1.2777	-8.9523	-1.2348	-9.8709
T8	120.00-100.00	-1.3751	-9.7858	-1.3218	-10.7018
T9	100.00-80.00	-1.4629	-10.5463	-1.4009	-11.4560
T10	80.00-60.00	-1.4541	-10.5328	-1.3897	-11.4023
T11	60.00-40.00	-1.5365	-11.2533	-1.4627	-12.0825
T12	40.00-20.00	-1.6212	-12.0026	-1.5372	-12.7598
T13	20.00-0.00	-1.5757	-11.8485	-1.5089	-12.5832

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Step Bolts	240.00 - 250.00	0.6000	0.6000
T1	2	Safety Line	240.00 - 250.00	0.6000	0.6000
T1	3	Feedline Ladder (Af)	240.00 - 245.00	0.6000	0.6000
T1	5	1.996 Hybrid	240.00 - 245.00	0.6000	0.6000
T1	7	1-5/8 MW Coax	240.00 - 245.00	0.6000	0.6000
T2	1	Step Bolts	220.00 - 240.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T2	2	Safety Line	220.00 - 240.00	0.6000	0.6000
T2	3	Feedline Ladder (Af)	220.00 - 240.00	0.6000	0.6000
T2	5	1.996 Hybrid	220.00 - 240.00	0.6000	0.6000
T2	7	1-5/8 MW Coax	220.00 - 240.00	0.6000	0.6000
T3	1	Step Bolts	200.00 - 220.00	0.6000	0.6000
T3	2	Safety Line	200.00 - 220.00	0.6000	0.6000
T3	3	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T3	5	1.996 Hybrid	200.00 - 220.00	0.6000	0.6000
T3	7	1-5/8 MW Coax	200.00 - 220.00	0.6000	0.6000
T4	1	Step Bolts	180.00 - 200.00	0.6000	0.6000
T4	2	Safety Line	180.00 - 200.00	0.6000	0.6000
T4	3	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T4	5	1.996 Hybrid	180.00 - 200.00	0.6000	0.6000
T4	7	1-5/8 MW Coax	180.00 - 200.00	0.6000	0.6000
T5	1	Step Bolts	160.00 - 180.00	0.6000	0.6000
T5	2	Safety Line	160.00 - 180.00	0.6000	0.6000
T5	3	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T5	5	1.996 Hybrid	160.00 - 180.00	0.6000	0.6000
T5	7	1-5/8 MW Coax	160.00 - 180.00	0.6000	0.6000
T6	1	Step Bolts	140.00 - 160.00	0.6000	0.6000
T6	2	Safety Line	140.00 - 160.00	0.6000	0.6000
T6	3	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T6	5	1.996 Hybrid	140.00 - 160.00	0.6000	0.6000
T6	7	1-5/8 MW Coax	140.00 - 160.00	0.6000	0.6000
T7	1	Step Bolts	120.00 - 140.00	0.6000	0.6000
T7	2	Safety Line	120.00 - 140.00	0.6000	0.6000
T7	3	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T7	5	1.996 Hybrid	120.00 - 140.00	0.6000	0.6000
T7	7	1-5/8 MW Coax	120.00 - 140.00	0.6000	0.6000
T8	1	Step Bolts	100.00 - 120.00	0.6000	0.6000
T8	2	Safety Line	100.00 - 120.00	0.6000	0.6000
T8	3	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T8	5	1.996 Hybrid	100.00 - 120.00	0.6000	0.6000
T8	7	1-5/8 MW Coax	100.00 - 120.00	0.6000	0.6000
T9	1	Step Bolts	80.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T9	2	Safety Line	100.00 80.00 - 100.00	0.6000	0.6000
T9	3	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T9	5	1.996 Hybrid	80.00 - 100.00	0.6000	0.6000
T9	7	1-5/8 MW Coax	80.00 - 100.00	0.6000	0.6000
T10	1	Step Bolts	60.00 - 80.00	0.6000	0.6000
T10	2	Safety Line	60.00 - 80.00	0.6000	0.6000
T10	3	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	5	1.996 Hybrid	60.00 - 80.00	0.6000	0.6000
T10	7	1-5/8 MW Coax	60.00 - 80.00	0.6000	0.6000
T11	1	Step Bolts	40.00 - 60.00	0.6000	0.6000
T11	2	Safety Line	40.00 - 60.00	0.6000	0.6000
T11	3	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	5	1.996 Hybrid	40.00 - 60.00	0.6000	0.6000
T11	7	1-5/8 MW Coax	40.00 - 60.00	0.6000	0.6000
T12	1	Step Bolts	20.00 - 40.00	0.6000	0.6000
T12	2	Safety Line	20.00 - 40.00	0.6000	0.6000
T12	3	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	5	1.996 Hybrid	20.00 - 40.00	0.6000	0.6000
T12	7	1-5/8 MW Coax	20.00 - 40.00	0.6000	0.6000
T13	1	Step Bolts	0.00 - 20.00	0.6000	0.6000
T13	2	Safety Line	0.00 - 20.00	0.6000	0.6000
T13	3	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	5	1.996 Hybrid	0.00 - 20.00	0.6000	0.6000
T13	7	1-5/8 MW Coax	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 t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Lightning Rod	B	From Leg	0.00 0.00 2.00	0.0000	250.00	No Ice 1/2" Ice	0.75 1.76	0.75 1.76	0.04 0.05
Flash Beacon Lighting	C	From Leg	0.00 0.00 1.00	0.0000	250.00	No Ice 1/2" Ice	2.70 3.10	2.70 3.10	0.05 0.07

FFVV-65C-R3-V1 w/	A	From Leg	4.00	0.0000	245.00	No Ice	12.97	6.20	0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Mount Pipe			0.00 0.00			1/2" Ice	13.62	6.77	0.32
FFVV-65C-R3-V1 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	12.97 13.62	6.20 6.77	0.18 0.32
FFVV-65C-R3-V1 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	12.97 13.62	6.20 6.77	0.18 0.32
Radio 4480 B71+B85	A	From Leg	3.75 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	2.85 3.06	1.38 1.54	0.09 0.11
Radio 4480 B71+B85	B	From Leg	3.75 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	2.85 3.06	1.38 1.54	0.09 0.11
Radio 4480 B71+B85	C	From Leg	3.75 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	2.85 3.06	1.38 1.54	0.09 0.11
Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	245.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
C10857001C Mount [3]	C	None	0.00	0.0000	245.00	No Ice 1/2" Ice	29.82 42.21	29.82 42.21	1.67 2.27

IP20B ODU	C	From Leg	0.50 0.00 0.00	0.0000	230.00	No Ice 1/2" Ice	0.68 0.79	0.29 0.37	0.01 0.02
Pipe Mount	C	From Leg	0.50 0.00 0.00	0.0000	230.00	No Ice 1/2" Ice	1.11 1.58	1.11 1.58	0.04 0.06

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	Aperture Area ft ²	Weight K
SB6-W60C	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	-25.0000		230.00	6.00	No Ice 1/2" Ice	28.27 29.07

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

Comb. No.	Description
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	250 - 240	Leg	Max Tension	7	3.37	0.23	-0.12
			Max. Compression	2	-5.59	-0.01	0.12
			Max. Mx	8	-1.60	0.41	-0.01
			Max. My	14	-1.19	0.00	0.41
			Max. Vy	8	1.05	-0.13	0.00
			Max. Vx	2	-1.02	-0.01	0.12
		Diagonal	Max Tension	16	2.81	0.00	0.00
			Max. Compression	4	-2.84	0.00	0.00
			Max. Mx	38	0.22	0.01	0.00
			Max. My	6	-0.03	0.00	0.00
			Max. Vy	38	0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Horizontal	Max Tension	6	0.74	0.00	0.00
			Max. Compression	18	-0.73	0.00	0.00
			Max. Mx	26	0.00	0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	240 - 220	Secondary Horizontal	Max. My	6	-0.28	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	8	0.00	-0.00	-0.00
		Top Girt	Max. Compression	20	-0.00	-0.00	-0.00
			Max. Mx	33	-0.00	-0.00	0.00
			Max. My	2	0.00	-0.00	0.00
			Max. Vy	33	0.00	-0.00	0.00
			Max. Vx	2	-0.00	-0.00	0.00
			Max Tension	22	0.05	0.00	0.00
		Bottom Girt	Max. Compression	10	-0.05	0.00	0.00
			Max. Mx	26	0.00	0.01	0.00
			Max. My	6	0.02	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	2	1.21	0.00	0.00
		Leg	Max. Compression	14	-1.18	0.00	0.00
			Max. Mx	26	0.00	0.01	0.00
			Max. My	6	0.62	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	25.78	0.11	-0.01
		Diagonal	Max. Compression	2	-29.38	-0.24	0.86
			Max. Mx	20	-25.52	0.73	-0.21
			Max. My	2	-29.38	-0.24	0.86
			Max. Vy	20	-2.28	0.73	-0.21
			Max. Vx	2	-2.63	-0.24	0.86
			Max Tension	4	5.10	0.00	0.00
		Horizontal	Max. Compression	4	-5.42	0.00	0.00
			Max. Mx	38	0.21	0.01	0.00
			Max. My	6	-0.13	0.00	0.00
			Max. Vy	38	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	4	0.77	0.00	0.00
		Secondary Horizontal	Max. Compression	15	-0.68	0.00	0.00
			Max. Mx	26	0.01	0.01	0.00
			Max. My	6	-0.19	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	8	0.00	-0.00	-0.00
T3	220 - 200	Top Girt	Max. Compression	20	-0.00	-0.00	-0.00
			Max. Mx	33	-0.00	-0.00	0.00
			Max. My	2	0.00	-0.00	0.00
			Max. Vy	33	0.00	-0.00	0.00
			Max. Vx	2	-0.00	-0.00	0.00
			Max Tension	14	1.26	0.00	0.00
		Bottom Girt	Max. Compression	2	-1.29	0.00	0.00
			Max. Mx	26	0.00	0.01	0.00
			Max. My	6	-0.68	0.00	0.00
			Max. Vy	26	0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	4	1.54	0.00	0.00
		Leg	Max. Compression	14	-1.50	0.00	0.00
			Max. Mx	26	-0.02	0.01	0.00
			Max. My	6	1.31	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	41.79	-0.33	0.02
		Diagonal	Max. Compression	2	-46.43	0.44	0.02
			Max. Mx	2	-31.43	0.86	0.24
			Max. My	4	-1.87	-0.02	-0.58
			Max. Vy	2	0.19	0.86	0.24
			Max. Vx	20	-0.12	-0.02	-0.55
			Max Tension	7	2.55	0.00	0.00
		Horizontal	Max. Compression	2	-2.61	0.00	0.00
			Max. Mx	2	1.13	0.02	0.00
			Max. My	14	-2.11	-0.01	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	200 - 180	Top Girt	Max. Vy	2	-0.01	0.02	0.00
			Max. Vx	14	0.00	0.00	0.00
			Max Tension	6	0.51	0.00	0.00
			Max. Compression	16	-0.47	0.00	0.00
			Max. Mx	26	0.01	-0.01	0.00
			Max. My	30	-0.02	0.00	0.00
		Leg	Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
			Max Tension	7	57.95	-0.49	0.03
			Max. Compression	2	-64.46	0.82	0.07
			Max. Mx	2	-64.46	0.82	0.07
			Max. My	8	-8.95	0.07	0.78
		Diagonal	Max. Vy	3	-0.11	0.81	0.07
			Max. Vx	8	-0.11	0.07	0.78
			Max Tension	4	2.29	0.00	0.00
			Max. Compression	4	-2.32	0.00	0.00
			Max. Mx	2	1.33	0.02	0.00
			Max. My	6	-2.08	-0.00	0.00
T5	180 - 160	Leg	Max. Vy	2	-0.01	0.02	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	73.50	-0.96	0.05
			Max. Compression	2	-82.48	0.97	0.05
			Max. Mx	2	-68.87	1.01	0.05
			Max. My	4	-4.18	-0.01	-1.03
		Diagonal	Max. Vy	6	0.10	-1.01	0.04
			Max. Vx	20	0.10	-0.05	-0.88
			Max Tension	4	2.61	0.00	0.00
			Max. Compression	4	-2.66	0.00	0.00
			Max. Mx	2	1.74	0.02	0.00
			Max. My	6	-2.30	0.00	0.00
		Leg	Max. Vy	37	0.01	0.01	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	89.42	-0.97	0.02
			Max. Compression	2	-101.47	1.49	0.08
			Max. Mx	2	-101.47	1.49	0.08
			Max. My	8	-12.73	0.08	1.38
T6	160 - 140	Leg	Max. Vy	6	0.16	-1.47	0.10
			Max. Vx	8	-0.22	0.08	1.38
			Max Tension	4	2.89	0.00	0.00
			Max. Compression	4	-2.95	0.00	0.00
			Max. Mx	6	1.63	0.02	0.00
			Max. My	6	-2.75	0.01	0.00
		Diagonal	Max. Vy	37	0.01	0.02	-0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	103.32	-1.61	0.10
			Max. Compression	2	-118.47	1.88	0.07
			Max. Mx	2	-118.47	1.88	0.07
			Max. My	4	-6.13	-0.06	-2.13
		Leg	Max. Vy	19	-0.16	1.83	-0.05
			Max. Vx	8	-0.23	0.04	2.12
			Max Tension	4	4.11	0.00	0.00
			Max. Compression	4	-4.18	0.00	0.00
			Max. Mx	2	3.16	0.05	0.00
			Max. My	6	-3.45	0.01	0.01
T7	140 - 120	Leg	Max. Vy	37	0.02	0.03	0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	119.77	-1.63	0.06
			Max. Compression	2	-138.62	2.33	0.10
			Max. Mx	2	-138.62	2.33	0.10
			Max. My	8	-16.31	0.13	2.03
		Diagonal	Max. Vy	19	-0.20	2.27	-0.13
			Max. Vx	8	-0.19	0.13	2.03
			Max Tension	4	4.40	0.00	0.00
			Max. Compression	18	-4.53	0.00	0.00
			Max. Mx	2	3.40	0.05	0.00
			Max. My	6	-3.98	0.01	0.01
		Leg	Max. Vy	37	0.02	0.04	-0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	136.57	-1.48	0.04
			Max. Compression	2	-138.62	2.33	0.10
			Max. Mx	2	-138.62	2.33	0.10
			Max. My	8	-16.31	0.13	2.03
T8	120 - 100	Leg	Max. Vy	19	-0.20	2.27	-0.13
			Max. Vx	8	-0.19	0.13	2.03
			Max Tension	4	4.40	0.00	0.00
			Max. Compression	18	-4.53	0.00	0.00
			Max. Mx	2	3.40	0.05	0.00
			Max. My	6	-3.98	0.01	0.01
		Diagonal	Max. Vy	37	0.02	0.04	-0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	136.57	-1.48	0.04
			Max. Compression	2	-138.62	2.33	0.10
			Max. Mx	2	-138.62	2.33	0.10
			Max. My	8	-16.31	0.13	2.03
		Leg	Max. Vy	19	-0.20	2.27	-0.13
			Max. Vx	8	-0.19	0.13	2.03
			Max Tension	4	4.40	0.00	0.00
			Max. Compression	18	-4.53	0.00	0.00
			Max. Mx	2	3.40	0.05	0.00
			Max. My	6	-3.98	0.01	0.01
T9	100 - 80	Leg	Max. Vy	37	0.02	0.04	-0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	136.57	-1.48	0.04
			Max. Compression	2	-138.62	2.33	0.10
			Max. Mx	2	-138.62	2.33	0.10
			Max. My	8	-16.31	0.13	2.03
		Diagonal	Max. Vy	19	-0.20	2.27	-0.13
			Max. Vx	8	-0.19	0.13	2.03
			Max Tension	4	4.40	0.00	0.00
			Max. Compression	18	-4.53	0.00	0.00
			Max. Mx	2	3.40	0.05	0.00
			Max. My	6	-3.98	0.01	0.01
		Leg	Max. Vy	37	0.02	0.04	-0.00
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	136.57	-1.48	0.04
			Max. Compression	2	-138.62	2.33	0.10
			Max. Mx	2	-138.62	2.33	0.10
			Max. My	8	-16.31	0.13	2.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T10	80 - 60	Diagonal	Max. Compression	2	-159.43	2.84	0.11
			Max. Mx	2	-159.43	2.84	0.11
			Max. My	8	-18.13	0.17	2.36
			Max. Vy	18	-0.27	2.79	-0.16
			Max. Vx	8	-0.21	0.17	2.36
			Max Tension	4	4.73	0.00	0.00
			Max. Compression	18	-4.93	0.00	0.00
			Max. Mx	2	3.74	0.07	0.01
			Max. My	6	-4.42	0.03	0.01
			Max. Vy	37	0.03	0.06	0.01
			Max. Vx	6	-0.00	0.00	0.00
			Max Tension	7	153.25	-2.40	0.10
		Leg	Max. Compression	2	-180.86	2.96	0.03
			Max. Mx	2	-180.86	2.96	0.03
			Max. My	8	-19.24	0.00	2.94
			Max. Vy	2	-0.20	2.96	0.03
			Max. Vx	8	0.30	0.00	2.94
			Max Tension	16	5.35	0.00	0.00
			Max. Compression	18	-5.72	0.00	0.00
			Max. Mx	6	5.04	0.11	-0.01
			Max. My	8	-3.13	0.07	0.01
			Max. Vy	37	0.05	0.09	0.01
			Max. Vx	8	-0.00	0.00	0.00
T11	60 - 40	Leg	Max Tension	7	166.88	-2.18	0.07
			Max. Compression	2	-199.19	3.27	0.12
			Max. Mx	2	-199.19	3.27	0.12
			Max. My	8	-22.26	0.15	3.02
			Max. Vy	10	-0.25	3.16	0.09
			Max. Vx	8	-0.26	-0.02	2.71
		Diagonal	Max Tension	16	4.29	0.00	0.00
			Max. Compression	18	-4.47	0.00	0.00
			Max. Mx	6	2.70	0.08	0.01
			Max. My	6	-3.74	0.05	0.01
			Max. Vy	37	0.04	0.08	-0.01
			Max. Vx	6	-0.00	0.00	0.00
		Leg	Max Tension	7	179.09	-2.37	0.06
			Max. Compression	2	-216.28	2.21	0.02
			Max. Mx	37	-1.73	-5.26	-0.01
			Max. My	8	-22.51	0.15	3.02
			Max. Vy	33	0.73	-5.23	-0.00
			Max. Vx	8	0.24	0.01	2.36
T12	40 - 20	Diagonal	Max Tension	16	4.85	0.00	0.00
			Max. Compression	18	-5.05	0.00	0.00
			Max. Mx	6	3.07	0.14	0.02
			Max. My	6	-4.47	0.11	0.02
			Max. Vy	37	0.06	0.13	-0.02
			Max. Vx	6	-0.00	0.00	0.00
		Leg	Max Tension	7	191.04	-2.43	0.10
			Max. Compression	2	-233.00	-0.00	-0.00
			Max. Mx	27	-40.34	8.36	0.00
			Max. My	8	-25.34	-0.13	3.82
			Max. Vy	33	-1.35	-5.23	-0.00
			Max. Vx	8	0.51	-0.13	3.82
T13	20 - 0	Diagonal	Max Tension	16	5.35	0.00	0.00
			Max. Compression	18	-6.07	0.00	0.00
			Max. Mx	37	-1.91	0.15	-0.02
			Max. My	30	-2.19	0.13	0.02
			Max. Vy	37	0.05	0.15	-0.02
			Max. Vx	30	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	232.89	18.50	-11.30
	Max. H _x	18	232.89	18.50	-11.30
	Max. H _z	7	-194.07	-15.51	9.57
	Min. Vert	7	-194.07	-15.51	9.57
	Min. H _x	7	-194.07	-15.51	9.57
	Min. H _z	18	232.89	18.50	-11.30
Leg B	Max. Vert	10	228.12	-18.34	-11.03
	Max. H _x	23	-186.44	15.17	9.19
	Max. H _z	23	-186.44	15.17	9.19
	Min. Vert	23	-186.44	15.17	9.19
	Min. H _x	10	228.12	-18.34	-11.03
	Min. H _z	10	228.12	-18.34	-11.03
Leg A	Max. Vert	2	237.29	-0.13	21.86
	Max. H _x	21	8.81	2.00	0.71
	Max. H _z	2	237.29	-0.13	21.86
	Min. Vert	15	-188.19	0.13	-17.91
	Min. H _x	9	21.74	-2.02	1.48
	Min. H _z	15	-188.19	0.13	-17.91

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	43.64	0.00	0.00	-19.31	4.11	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	52.37	0.47	-33.10	-4188.42	-103.25	-5.75
0.9 Dead+1.0 Wind 0 deg - No Ice	39.28	0.47	-33.10	-4177.12	-104.31	-5.74
1.2 Dead+1.0 Wind 30 deg - No Ice	52.37	15.36	-26.47	-3399.43	-1961.98	-12.79
0.9 Dead+1.0 Wind 30 deg - No Ice	39.28	15.36	-26.47	-3389.11	-1960.62	-12.77
1.2 Dead+1.0 Wind 60 deg - No Ice	52.37	26.49	-15.67	-2062.83	-3374.82	-21.37
0.9 Dead+1.0 Wind 60 deg - No Ice	39.28	26.49	-15.67	-2054.25	-3371.59	-21.34
1.2 Dead+1.0 Wind 90 deg - No Ice	52.37	31.29	-0.64	-170.79	-3955.20	-22.79
0.9 Dead+1.0 Wind 90 deg - No Ice	39.28	31.29	-0.64	-164.68	-3951.24	-22.76
1.2 Dead+1.0 Wind 120 deg - No Ice	52.37	28.17	16.22	1984.54	-3488.79	-14.18
0.9 Dead+1.0 Wind 120 deg - No Ice	39.28	28.17	16.22	1987.79	-3485.52	-14.17
1.2 Dead+1.0 Wind 150 deg - No Ice	52.37	15.22	27.07	3401.27	-1876.75	-4.89
0.9 Dead+1.0 Wind 150 deg - No Ice	39.28	15.22	27.07	3402.62	-1875.57	-4.89
1.2 Dead+1.0 Wind 180 deg - No Ice	52.37	-0.38	30.39	3834.18	92.25	5.97
0.9 Dead+1.0 Wind 180 deg - No Ice	39.28	-0.38	30.39	3834.94	90.84	5.96
1.2 Dead+1.0 Wind 210 deg - No Ice	52.37	-15.18	26.20	3291.21	1930.53	12.59
0.9 Dead+1.0 Wind 210 deg - No Ice	39.28	-15.18	26.20	3292.69	1926.73	12.57
1.2 Dead+1.0 Wind 240 deg - No Ice	52.37	-28.34	16.66	2084.19	3536.13	20.53
0.9 Dead+1.0 Wind 240 deg - No Ice	39.28	-28.34	16.66	2087.26	3530.30	20.51
1.2 Dead+1.0 Wind 270 deg - No Ice	52.37	-31.12	0.43	75.86	3926.40	21.65
0.9 Dead+1.0 Wind 270 deg - No Ice	39.28	-31.12	0.43	81.52	3920.02	21.63

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
1.2 Dead+1.0 Wind 300 deg	52.37	-26.17	-14.90	-1885.35	3311.58	14.23
- No Ice						
0.9 Dead+1.0 Wind 300 deg	39.28	-26.17	-14.90	-1877.08	3305.99	14.21
- No Ice						
1.2 Dead+1.0 Wind 330 deg	52.37	-15.06	-27.19	-3474.01	1850.93	5.42
- No Ice						
0.9 Dead+1.0 Wind 330 deg	39.28	-15.06	-27.19	-3463.62	1847.32	5.42
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	58.81	0.00	0.00	-27.70	5.91	-0.00
1.2 Dead+1.0 Wind 0	58.81	0.03	-2.71	-367.12	-1.52	-0.43
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30	58.81	1.28	-2.20	-306.25	-156.00	-1.10
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60	58.81	2.20	-1.30	-194.84	-272.73	-1.81
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90	58.81	2.62	-0.04	-38.03	-323.55	-2.08
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120	58.81	2.34	1.35	138.39	-283.08	-1.39
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 150	58.81	1.28	2.26	256.81	-151.80	-0.54
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	58.81	-0.03	2.53	290.42	11.99	0.45
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	58.81	-1.26	2.18	245.94	164.86	1.09
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	58.81	-2.32	1.36	143.32	294.19	1.76
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	58.81	-2.60	0.03	-20.98	332.38	2.00
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	58.81	-2.20	-1.26	-184.33	282.63	1.40
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	58.81	-1.27	-2.27	-314.32	161.23	0.58
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	43.64	0.13	-9.98	-1267.56	-26.84	-1.65
Dead+Wind 30 deg - Service	43.64	4.65	-8.01	-1034.19	-586.84	-3.66
Dead+Wind 60 deg - Service	43.64	8.02	-4.74	-631.14	-1011.73	-6.12
Dead+Wind 90 deg - Service	43.64	9.46	-0.18	-61.59	-1185.35	-6.53
Dead+Wind 120 deg - Service	43.64	8.50	4.89	583.31	-1044.37	-4.06
Dead+Wind 150 deg - Service	43.64	4.61	8.18	1009.29	-562.46	-1.40
Dead+Wind 180 deg - Service	43.64	-0.11	9.20	1140.69	29.11	1.71
Dead+Wind 210 deg - Service	43.64	-4.60	7.93	977.78	583.26	3.60
Dead+Wind 240 deg - Service	43.64	-8.55	5.02	611.84	1063.34	5.88
Dead+Wind 270 deg - Service	43.64	-9.41	0.12	8.99	1182.54	6.20
Dead+Wind 300 deg - Service	43.64	-7.92	-4.52	-580.34	999.05	4.07
Dead+Wind 330 deg - Service	43.64	-4.56	-8.22	-1055.55	560.49	1.55

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-43.64	0.00	0.00	43.64	0.00	0.000%
2	0.47	-52.37	-33.10	-0.47	52.37	33.10	0.001%
3	0.47	-39.28	-33.10	-0.47	39.28	33.10	0.000%
4	15.36	-52.37	-26.47	-15.36	52.37	26.47	0.000%
5	15.36	-39.28	-26.47	-15.36	39.28	26.47	0.000%
6	26.49	-52.37	-15.67	-26.49	52.37	15.67	0.000%
7	26.49	-39.28	-15.67	-26.49	39.28	15.67	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
8	31.29	-52.37	-0.64	-31.29	52.37	0.64	0.000%
9	31.29	-39.28	-0.64	-31.29	39.28	0.64	0.000%
10	28.17	-52.37	16.22	-28.17	52.37	-16.22	0.000%
11	28.17	-39.28	16.22	-28.17	39.28	-16.22	0.000%
12	15.22	-52.37	27.07	-15.22	52.37	-27.07	0.000%
13	15.22	-39.28	27.07	-15.22	39.28	-27.07	0.000%
14	-0.38	-52.37	30.39	0.38	52.37	-30.39	0.000%
15	-0.38	-39.28	30.39	0.38	39.28	-30.39	0.000%
16	-15.18	-52.37	26.20	15.18	52.37	-26.20	0.000%
17	-15.18	-39.28	26.20	15.18	39.28	-26.20	0.000%
18	-28.34	-52.37	16.66	28.34	52.37	-16.66	0.000%
19	-28.34	-39.28	16.66	28.34	39.28	-16.66	0.000%
20	-31.12	-52.37	0.43	31.12	52.37	-0.43	0.000%
21	-31.12	-39.28	0.43	31.12	39.28	-0.43	0.000%
22	-26.17	-52.37	-14.90	26.17	52.37	14.90	0.000%
23	-26.17	-39.28	-14.90	26.17	39.28	14.90	0.000%
24	-15.06	-52.37	-27.19	15.06	52.37	27.19	0.000%
25	-15.06	-39.28	-27.19	15.06	39.28	27.19	0.000%
26	0.00	-58.81	0.00	-0.00	58.81	-0.00	0.000%
27	0.03	-58.81	-2.71	-0.03	58.81	2.71	0.000%
28	1.28	-58.81	-2.20	-1.28	58.81	2.20	0.000%
29	2.20	-58.81	-1.30	-2.20	58.81	1.30	0.000%
30	2.62	-58.81	-0.04	-2.62	58.81	0.04	0.000%
31	2.34	-58.81	1.35	-2.34	58.81	-1.35	0.000%
32	1.28	-58.81	2.26	-1.28	58.81	-2.26	0.000%
33	-0.03	-58.81	2.53	0.03	58.81	-2.53	0.000%
34	-1.26	-58.81	2.18	1.26	58.81	-2.18	0.000%
35	-2.32	-58.81	1.36	2.32	58.81	-1.36	0.000%
36	-2.60	-58.81	0.03	2.60	58.81	-0.03	0.000%
37	-2.20	-58.81	-1.26	2.20	58.81	1.26	0.000%
38	-1.27	-58.81	-2.27	1.27	58.81	2.27	0.000%
39	0.13	-43.64	-9.98	-0.13	43.64	9.98	0.000%
40	4.65	-43.64	-8.01	-4.65	43.64	8.01	0.000%
41	8.02	-43.64	-4.74	-8.02	43.64	4.74	0.000%
42	9.46	-43.64	-0.18	-9.46	43.64	0.18	0.000%
43	8.50	-43.64	4.89	-8.50	43.64	-4.89	0.000%
44	4.61	-43.64	8.18	-4.61	43.64	-8.18	0.000%
45	-0.11	-43.64	9.20	0.11	43.64	-9.20	0.000%
46	-4.60	-43.64	7.93	4.60	43.64	-7.93	0.000%
47	-8.55	-43.64	5.02	8.55	43.64	-5.02	0.000%
48	-9.41	-43.64	0.12	9.41	43.64	-0.12	0.000%
49	-7.92	-43.64	-4.52	7.92	43.64	4.52	0.000%
50	-4.56	-43.64	-8.22	4.56	43.64	8.22	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	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001

18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
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	250 - 240	6.000	39	0.2501	0.0535
T2	240 - 220	5.466	39	0.2484	0.0545
T3	220 - 200	4.441	39	0.2254	0.0462
T4	200 - 180	3.555	39	0.1907	0.0349
T5	180 - 160	2.806	39	0.1602	0.0271
T6	160 - 140	2.179	39	0.1325	0.0220
T7	140 - 120	1.655	39	0.1097	0.0174
T8	120 - 100	1.212	39	0.0932	0.0137
T9	100 - 80	0.837	39	0.0760	0.0101
T10	80 - 60	0.539	39	0.0582	0.0076
T11	60 - 40	0.314	39	0.0432	0.0058
T12	40 - 20	0.148	39	0.0284	0.0035
T13	20 - 0	0.047	39	0.0139	0.0019

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	Lightning Rod	39	6.000	0.2501	0.0535	257389
245.00	FFVV-65C-R3-V1 w/ Mount Pipe	39	5.733	0.2498	0.0543	257389
230.00	SB6-W60C	39	4.941	0.2398	0.0517	47849

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	20.101	2	0.8473	0.1910
T2	240 - 220	18.289	2	0.8413	0.1915
T3	220 - 200	14.820	2	0.7612	0.1616
T4	200 - 180	11.832	2	0.6407	0.1220
T5	180 - 160	9.320	2	0.5358	0.0948
T6	160 - 140	7.229	2	0.4414	0.0768
T7	140 - 120	5.484	2	0.3646	0.0610
T8	120 - 100	4.014	2	0.3091	0.0478
T9	100 - 80	2.773	2	0.2519	0.0355
T10	80 - 60	1.786	2	0.1926	0.0265
T11	60 - 40	1.041	2	0.1429	0.0203
T12	40 - 20	0.491	2	0.0939	0.0121
T13	20 - 0	0.155	2	0.0461	0.0065

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	Lightning Rod	2	20.101	0.8473	0.1910	72946
245.00	FFVV-65C-R3-V1 w/ Mount Pipe	2	19.193	0.8462	0.1921	72946
230.00	SB6-W60C	2	16.511	0.8113	0.1806	13840

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 $\frac{P_u}{\phi P_n}$
T1	250 - 240	1 1/2	10.00	3.08	98.7 K=1.00	1.7672	-4.11	39.03	0.105 ¹
T2	240 - 220	2	20.00	3.21	77.0 K=1.00	3.1416	-26.90	91.64	0.294 ¹
T3	220 - 200	P5x.258	20.02	5.00	32.0 K=1.00	4.2999	-46.43	179.55	0.259 ¹
T4	200 - 180	P6x.28	20.02	5.00	26.7 K=1.00	5.5813	-64.46	238.36	0.270 ¹
T5	180 - 160	P8x0.25	20.02	5.00	20.3 K=1.00	6.5777	-82.48	287.23	0.287 ¹
T6	160 - 140	P8x.322	20.02	5.00	20.4 K=1.00	8.3993	-101.47	366.59	0.277 ¹
T7	140 - 120	P10x.365	20.02	10.01	32.7 K=1.00	11.908 3	-118.47	495.59	0.239 ¹
T8	120 - 100	P10x.365	20.02	10.01	32.7 K=1.00	11.908 3	-138.62	495.59	0.280 ¹
T9	100 - 80	P10x.365	20.02	10.01	32.7 K=1.00	11.908 3	-159.43	495.59	0.322 ¹
T10	80 - 60	P12x.375	20.02	10.01	27.4 K=1.00	14.579 0	-180.86	620.91	0.291 ¹
T11	60 - 40	P12x.375	20.03	10.02	27.5	14.579	-199.19	620.86	0.321 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T12	40 - 20	P12x.375	20.03	10.02	K=1.00 27.5	0 14.579	-216.28	620.86	0.348 ¹
T13	20 - 0	P12x.375	20.03	10.02	K=1.00 27.5	0 14.579	-233.00	620.86	0.375 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	250 - 240	1	5.05	4.89	164.4 K=0.70	0.7854	-2.84	6.57	0.433 ¹
T2	240 - 220	1 1/4	5.13	4.91	132.1 K=0.70	1.2272	-5.42	15.87	0.342 ¹
T3	220 - 200	L2x2x3/16	6.52	3.09	100.6 K=1.07	0.7150	-2.61	17.55	0.149 ¹
T4	200 - 180	L2x2x3/16	8.45	4.00	121.4 K=1.00	0.7150	-2.28	13.81	0.165 ¹
T5	180 - 160	L2x2x1/4	9.70	4.54	134.8 K=0.97	0.9380	-2.66	14.78	0.180 ¹
T6	160 - 140	L2x2x1/4	11.01	5.21	150.4 K=0.94	0.9380	-2.84	11.87	0.240 ¹
T7	140 - 120	L3x3x3/16	14.96	7.13	138.0 K=0.96	1.0900	-4.18	16.38	0.255 ¹
T8	120 - 100	L3x3x3/16	16.11	7.72	147.1 K=0.95	1.0900	-4.53	14.43	0.314 ¹
T9	100 - 80	L3x3x1/4	17.31	8.33	157.3 K=0.93	1.4400	-4.93	16.65	0.296 ¹
T10	80 - 60	L3x3x3/8	18.55	8.87	166.7 K=0.92	2.1100	-5.72	21.72	0.263 ¹
T11	60 - 40	L3x3x1/4	20.16	9.75	179.3 K=0.91	1.4400	-4.47	12.82	0.349 ¹
T12	40 - 20	L3x3x3/8	21.92	10.64	194.4 K=0.89	2.1100	-5.05	15.98	0.316 ¹
T13	20 - 0	L3 1/2x3 1/2x1/4	23.71	11.55	180.7 K=0.91	1.6900	-6.07	14.81	0.410 ¹

¹ P_u / φP_n controls

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 $\frac{P_u}{\phi P_n}$
T1	250 - 240	1	4.00	3.88	130.2 K=0.70	0.7854	-0.73	10.42	0.070 ¹
T2	240 - 220	1	4.00	3.83	128.8 K=0.70	0.7854	-0.68	10.63	0.064 ¹

¹ $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T1	250 - 240	1	2.00	1.94	83.9 K=0.90	0.7854	-0.00	17.56	0.000 ¹ ✓
T2	240 - 220	1	2.00	1.92	83.7 K=0.91	0.7854	-0.00	17.59	0.000 ¹ ✓

¹ $P_u / \phi P_n$ 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	250 - 240	1 1/8	4.00	3.88	115.7 K=0.70	0.9940	-0.05	15.91	0.003 ¹ ✓
T2	240 - 220	1 1/8	4.00	3.83	114.5 K=0.70	0.9940	-1.29	16.15	0.080 ¹ ✓
T3	220 - 200	L2x2x1/8	4.00	3.54	113.4 K=1.06	0.4844	-0.80	10.27	0.078 ¹ ✓

¹ $P_u / \phi P_n$ controls

Bottom 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	250 - 240	1	4.00	3.88	130.2 K=0.70	0.7854	-1.18	10.42	0.113 ¹ ✓
T2	240 - 220	1	4.00	3.83	128.8 K=0.70	0.7854	-1.50	10.63	0.142 ¹ ✓

¹ $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	250 - 240	1 1/2	10.00	0.38	12.0	1.7672	3.37	79.52	0.042 ¹ ✓
T2	240 - 220	2	20.00	0.38	9.0	3.1416	25.78	141.37	0.182 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	220 - 200	P5x.258	20.02	5.00	32.0	4.2999	41.79	193.49	0.216 ¹
T4	200 - 180	P6x.28	20.02	5.00	26.7	5.5813	57.95	251.16	0.231 ¹
T5	180 - 160	P8x0.25	20.02	5.00	20.3	6.5777	73.50	296.00	0.248 ¹
T6	160 - 140	P8x.322	20.02	5.00	20.4	8.3993	89.42	377.97	0.237 ¹
T7	140 - 120	P10x.365	20.02	10.01	32.7	11.908 3	103.32	535.87	0.193 ¹
T8	120 - 100	P10x.365	20.02	10.01	32.7	11.908 3	119.77	535.87	0.224 ¹
T9	100 - 80	P10x.365	20.02	10.01	32.7	11.908 3	136.57	535.87	0.255 ¹
T10	80 - 60	P12x.375	20.02	10.01	27.4	14.579 0	153.25	656.05	0.234 ¹
T11	60 - 40	P12x.375	20.03	10.02	27.5	14.579 0	166.88	656.05	0.254 ¹
T12	40 - 20	P12x.375	20.03	10.02	27.5	14.579 0	179.10	656.05	0.273 ¹
T13	20 - 0	P12x.375	20.03	10.02	27.5	14.579 0	191.04	656.05	0.291 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 K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	250 - 240	1	5.05	4.89	234.8	0.7854	2.81	25.45	0.111 ¹
T2	240 - 220	1 1/4	5.13	4.91	188.7	1.2272	5.10	39.76	0.128 ¹
T3	220 - 200	L2x2x3/16	6.52	3.09	60.1	0.7150	2.55	23.17	0.110 ¹
T4	200 - 180	L2x2x3/16	8.15	3.85	74.9	0.7150	2.29	23.17	0.099 ¹
T5	180 - 160	L2x2x1/4	9.70	4.54	89.5	0.9380	2.61	30.39	0.086 ¹
T6	160 - 140	L2x2x1/4	10.68	5.04	99.4	0.9380	2.89	30.39	0.095 ¹
T7	140 - 120	L3x3x3/16	14.96	7.13	91.1	1.0900	4.11	35.32	0.116 ¹
T8	120 - 100	L3x3x3/16	16.11	7.72	98.7	1.0900	4.40	35.32	0.124 ¹
T9	100 - 80	L3x3x1/4	17.31	8.33	107.5	1.4400	4.73	46.66	0.101 ¹
T10	80 - 60	L3x3x3/8	18.55	8.87	116.6	2.1100	5.35	68.36	0.078 ¹
T11	60 - 40	L3x3x1/4	20.16	9.75	125.9	1.4400	4.29	46.66	0.092 ¹
T12	40 - 20	L3x3x3/8	21.92	10.64	139.9	2.1100	4.85	68.36	0.071 ¹
T13	20 - 0	L3 1/2x3 1/2x1/4	23.71	11.55	127.1	1.6900	5.35	54.76	0.098 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
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¹ P_u / φP_n controls

Horizontal Design Data (Tension)

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	250 - 240	1	4.00	3.88	186.0	0.7854	0.74	25.45	0.029 ¹
T2	240 - 220	1	4.00	3.83	184.0	0.7854	0.77	25.45	0.030 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Tension)

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	250 - 240	1	2.00	1.94	93.0	0.7854	0.00	25.45	0.000 ¹
T2	240 - 220	1	2.00	1.92	92.0	0.7854	0.00	25.45	0.000 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 K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	250 - 240	1 1/8	4.00	3.88	165.3	0.9940	0.05	32.21	0.002 ¹
T2	240 - 220	1 1/8	4.00	3.83	163.6	0.9940	1.26	32.21	0.039 ¹
T3	220 - 200	L2x2x1/8	4.00	3.54	67.8	0.4844	0.80	15.69	0.051 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Tension)

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	250 - 240	1	4.00	3.88	186.0	0.7854	1.21	25.45	0.047 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	240 - 220	1	4.00	3.83	184.0	0.7854	1.54	25.45	0.061 ¹



¹ P_u / φP_n controls

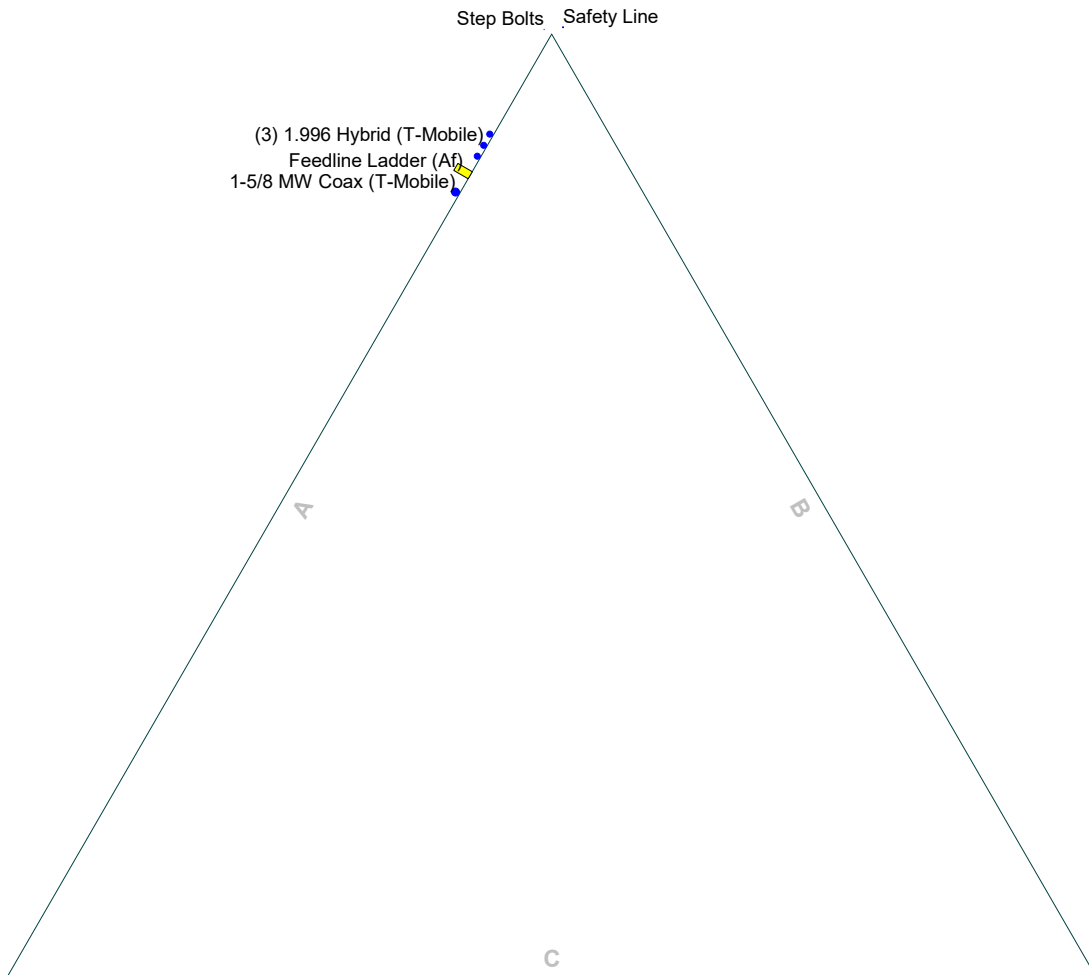
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	250 - 240	Leg	1 1/2	1	-4.11	39.03	10.5	Pass
T2	240 - 220	Leg	2	28	-26.90	91.64	29.4	Pass
T3	220 - 200	Leg	P5x.258	78	-46.43	179.55	25.9	Pass
T4	200 - 180	Leg	P6x.28	108	-64.46	238.36	27.0	Pass
T5	180 - 160	Leg	P8x0.25	135	-82.48	287.23	28.7	Pass
T6	160 - 140	Leg	P8x.322	162	-101.47	366.59	27.7	Pass
T7	140 - 120	Leg	P10x.365	189	-118.47	495.59	23.9	Pass
T8	120 - 100	Leg	P10x.365	204	-138.62	495.59	28.0	Pass
T9	100 - 80	Leg	P10x.365	219	-159.43	495.59	32.2	Pass
T10	80 - 60	Leg	P12x.375	234	-180.86	620.91	29.1	Pass
T11	60 - 40	Leg	P12x.375	249	-199.19	620.86	32.1	Pass
T12	40 - 20	Leg	P12x.375	264	-216.28	620.86	34.8	Pass
T13	20 - 0	Leg	P12x.375	279	-233.00	620.86	37.5	Pass
T1	250 - 240	Diagonal	1	12	-2.84	6.57	43.3	Pass
T2	240 - 220	Diagonal	1 1/4	39	-5.42	15.87	34.2	Pass
T3	220 - 200	Diagonal	L2x2x3/16	104	-2.61	17.55	14.9	Pass
T4	200 - 180	Diagonal	L2x2x3/16	113	-2.28	13.81	16.5	Pass
T5	180 - 160	Diagonal	L2x2x1/4	140	-2.66	14.78	18.0	Pass
T6	160 - 140	Diagonal	L2x2x1/4	167	-2.84	11.87	24.0	Pass
T7	140 - 120	Diagonal	L3x3x3/16	194	-4.18	16.38	25.5	Pass
T8	120 - 100	Diagonal	L3x3x3/16	210	-4.53	14.43	31.4	Pass
T9	100 - 80	Diagonal	L3x3x1/4	225	-4.93	16.65	29.6	Pass
T10	80 - 60	Diagonal	L3x3x3/8	240	-5.72	21.72	26.3	Pass
T11	60 - 40	Diagonal	L3x3x1/4	255	-4.47	12.82	34.9	Pass
T12	40 - 20	Diagonal	L3x3x3/8	270	-5.05	15.98	31.6	Pass
T13	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	285	-6.07	14.81	41.0	Pass
T1	250 - 240	Horizontal	1	16	-0.73	10.42	7.0	Pass
T2	240 - 220	Horizontal	1	57	-0.68	10.63	6.4	Pass
T1	250 - 240	Secondary Horizontal	1	13	-0.00	17.56	0.0	Pass
T2	240 - 220	Secondary Horizontal	1	40	-0.00	17.59	0.0	Pass
T1	250 - 240	Top Girt	1 1/8	4	-0.05	15.91	0.3	Pass
T2	240 - 220	Top Girt	1 1/8	33	-1.29	16.15	8.0	Pass
T3	220 - 200	Top Girt	L2x2x1/8	80	-0.80	10.27	7.8	Pass
T1	250 - 240	Bottom Girt	1	9	-1.18	10.42	11.3	Pass
T2	240 - 220	Bottom Girt	1	36	-1.50	10.63	14.2	Pass
Summary								
Leg (T13)							37.5	Pass
Diagonal (T1)							43.3	Pass
Horizontal (T1)							7.0	Pass
Secondary Horizontal (T1)							0.0	Pass
Top Girt (T2)							8.0	Pass
Bottom Girt (T2)							14.2	Pass
RATING =							43.3	Pass

APPENDIX B
BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



SMW Engineering Group, Inc.
158 Business Center Drive
Birmingham, AL 35244
Phone: (205) 252-6985
FAX: (205) 320-1504

Job: 9JK1918A		
Project: 17-5641.2		
Client: NexTower Development	Drawn by: Justin Roberson	App'd:
Code: TIA-222-H	Date: 02/09/22	Scale: NTS
Path:	Dwg No. E-7	

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info		
Site #	9JK1918A	
Site Name	White Springs	
Job #	17-5641.2	

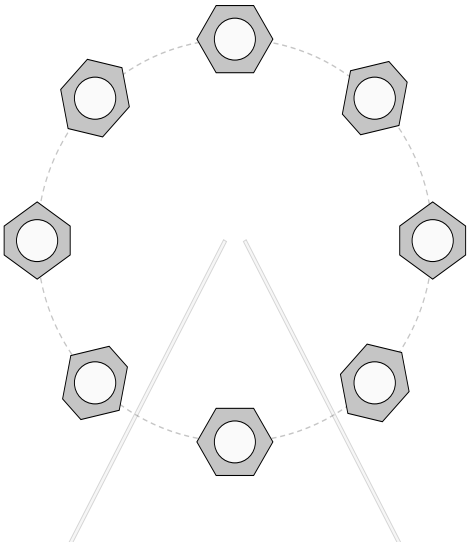
Analysis Considerations		
TIA-222 Revision	H	
Grout Considered:	No	
I_{ar} (in)	0	

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	237.29	194.07
Shear Force (kips)	21.86	18.22

*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		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
(8) 1-1/4" ϕ bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi)		P_{u_c} = 29.66	ϕP_{n_c} = 120.39
I_{ar} (in): 0		V_u = 2.73	ϕV_n = 54.17
		M_u = n/a	ϕM_n = n/a
		Stress Rating	
		23.7%	
		Pass	

Drilled Pier Foundation

Site #: JK1918A
 Site Name: White Springs
 Job Number: 17-5641.2

TIA-222 Revision: H
 Tower Type: Self Support

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)		
Axial Force (kips)	237	194
Shear Force (kips)	22	18

Material Properties	
Concrete Strength, f _c :	4 ksi
Rebar Strength, F _y :	60 ksi

Pier Design Data	
Depth	47 ft
Ext. Above Grade	1 ft
Pier Section 1	
From 1' above grade to 47' below grade	
Pier Diameter	8 ft
Rebar Quantity	24
Rebar Size	11
Clear Cover to Ties	3 in
Tie Size	4

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{v=0} (ft from TOC)	23.26	23.26
Soil Safety Factor	50.26	61.42
Max Moment (kip-ft)	345.91	283.02
Rating*	2.5%	2.1%
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	441.23	441.23
End Bearing (kips)	384.53	-
Weight of Concrete (kips)	253.63	190.22
Total Capacity (kips)	825.76	631.45
Axial (kips)	490.63	194.00
Rating*	56.6%	29.3%
Reinforced Concrete Check		
	Compression	Uplift
Critical Depth (ft from TOC)	23.26	22.82
Critical Moment (kip-ft)	345.91	282.88
Critical Moment Capacity	7566.15	6823.60
Rating*	4.4%	3.9%

Soil Interaction Rating*	56.6%
Structural Foundation Rating*	4.4%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☒
N/A	☐

Soil Profile			
Groundwater Depth	0	# of Layers	9

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	3	3	55	87.6		30	0.029	0.029				4	Cohesionless
2	3	12	9	60	87.6		33	0.000	0.000	0.48	0.48			Cohesionless
3	12	17	5	60	87.6		32	0.000	0.000	0.74	0.74			Cohesionless
4	17	22	5	55	87.6		30	0.000	0.000	0.30	0.30			Cohesionless
5	22	27	5	50	87.6		29	0.000	0.000	0.34	0.34			Cohesionless
6	27	32	5	55	87.6		30	0.000	0.000	0.38	0.38			Cohesionless
7	32	37	5	55	87.6		30	0.00	0.00	0.56	0.56			Cohesionless
8	37	42	5	55	87.6		30	0.00	0.00	0.60	0.60			Cohesionless
9	42	47	5	55	87.6	1.6	0	0.88	0.88			10.2		Cohesive