

Date: **December 03, 2021**



B+T Group
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Tulsa, OK 74119
(918) 587-4630

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 236777
Site Name: Lake City East

Crown Castle Designation: **BU Number:** 846215
Site Name: Osceola
JDE Job Number: 685950
Work Order Number: 2051230
Order Number: 585989 Rev. 0

Engineering Firm Designation: **B+T Group Project Number:** 105292.004.01

Site Data: **3099 Ne Mt Carrie Rd, Lake City, Columbia County, FL**
Latitude 30° 14' 3.66", Longitude -82° 29' 56.23"
245 Foot - Self Support Tower

B+T Group 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:

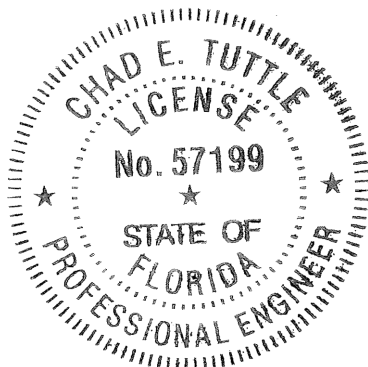
LC5: Proposed Equipment Configuration

Sufficient Capacity

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2020 Florida Building Code 7th Edition. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Clint Coody

Respectfully submitted by: B+T Engineering, Inc.
COA: 27496;



Chad E. Tuttle, P.E.

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1) INTRODUCTION

This tower is a 245 ft Self Support tower designed by Sabre.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	118 mph
Exposure Category:	B
Topographic Factor:	1
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)
235.0	235.0	6	Antel	RWA-80016CF	10 2	1-5/8 2
		6	Commscope	NHH-65C-R2B		
		2	Commscope	RCMDC-6627-PF-48		
		3	Ericsson	4449		
		3	Ericsson	8843		
		3	Ericsson	AIR 6449 B77		
		3	Vzwsmart	V-Bracing Kit		
		3	Vzwsmart	P40-278x150 Horizontal pipe mount		
		6	Vzwsmart	MSKI-108"long ,P2 Std Pipe		
		1	--	Sector Mount [SM 403-3]		

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)
248.0	251.0	3	Ericsson	RRUS 32	12 6 4 3	1-5/8 3/4 3/8 5/16
		6	Powerwave Tech.	LGP 17401		
		2	Raycap	DC6-48-60-18-8F		
	250.0	6	Andrew	SBNHH-1D65B		
		3	Commscope	NNHH-65B-R4		
		6	Decibel	DB878G105AXY		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 8843 B2/B66A		
		2	Raycap	DC6-48-60-18-8C		
		6	Miscl	L 2.5x2.5x3/16x6'		
	248.0	1	--	Platform Mount [LP 603-1]		
		1	Andrew	UHX6-59/L		
220.0	220.0	1	--	Pipe Mount [PM 601-1]	1	EW63
		1	Andrew	UHX6-59/L		
194.0	194.0	1	Andrew	UHX6-59/L	1	EW63
		1	--	Pipe Mount [PM 601-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	5169136	CCI Sites
Mount Analysis Report	10088484	CCI Sites
Mount Reinforcement Report	10088471	CCI Sites
Foundation Drawing	4720733	CCI Sites
Geotech Report	4720732	CCI Sites
Crown CAD Package	Date: 11/30/2021	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

- 1) The 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. B+T Group 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	245 - 240	Leg	Sabre 3.5"x0.216"	1	-8.687	86.611	10.0	Pass
T2	240 - 220	Leg	Sabre 4.5" x 0.337"	15	-36.484	184.497	19.8	Pass
T3	220 - 200	Leg	Sabre 4.5"x0.5310"	41	-65.374	247.512	26.4	Pass
T4	200 - 180	Leg	Sabre 5.5625" x 0.5"	62	-95.564	324.977	29.4	Pass
T5	180 - 160	Leg	Sabre 5.5625" x 0.625"	83	-125.370	393.624	31.9	Pass
T6	160 - 140	Leg	Sabre 8.625"x0.5"	104	-152.021	530.833	28.6	Pass
T7	140 - 120	Leg	Sabre 8.625"x0.5"	119	-180.733	530.833	34.0	Pass
T8	120 - 100	Leg	Sabre 8.625" x 0.593"	134	-209.554	620.649	33.8	Pass
T9	100 - 80	Leg	Sabre 8.625" x 0.718"	149	-238.637	736.992	32.4	Pass
T10	80 - 60	Leg	Sabre 8.625" x 0.593"	165	-259.747	684.360	38.0	Pass
T11	60 - 40	Leg	Sabre 10.75"x0.5"	216	-289.056	745.646	38.8	Pass
T12	40 - 20	Leg	Sabre 12.75"x0.5"	267	-319.315	896.507	35.6	Pass
T13	20 - 0	Leg	Sabre 12.75"x0.5"	318	-350.823	896.507	39.1	Pass
T1	245 - 240	Diagonal	L1 3/4x1 3/4x1/4	12	-2.248	12.105	18.6	Pass
T2	240 - 220	Diagonal	L2 1/2x2 1/2x3/8	18	-4.320	36.223	11.9	Pass
T3	220 - 200	Diagonal	L2 1/2x2 1/2x1/4	46	-5.260	15.987	32.9	Pass
T4	200 - 180	Diagonal	L3x3x3/8	67	-6.286	31.520	19.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	180 - 160	Diagonal	L3x3x3/8	88	-6.703	24.695	27.1	Pass
T6	160 - 140	Diagonal	L3 1/2x3 1/2x3/8	109	-8.009	27.798	28.8	Pass
T7	140 - 120	Diagonal	L3 1/2x3 1/2x3/8	123	-8.580	23.270	36.9	Pass
T8	120 - 100	Diagonal	L4x4x3/8	138	-9.320	29.877	31.2	Pass
T9	100 - 80	Diagonal	L4x4x3/8	153	-10.074	25.540	39.4	Pass
T10	80 - 60	Diagonal	L4x4x1/4	174	-12.942	26.162	49.5	Pass
T11	60 - 40	Diagonal	L3 1/2x4x5/16	225	-13.897	28.248	49.2	Pass
T12	40 - 20	Diagonal	L4x4x3/8	276	-15.007	31.354	47.9	Pass
T13	20 - 0	Diagonal	L4x4x3/8	327	-15.764	28.450	55.4	Pass
T10	80 - 60	Horizontal	L4x4x3/8	173	-9.431	27.352	34.5	Pass
T11	60 - 40	Horizontal	L4x4x3/8	224	-10.199	23.524	43.4	Pass
T12	40 - 20	Horizontal	L5x5x5/16	275	-11.018	34.442	32.0	Pass
T13	20 - 0	Horizontal	L5x5x5/16	326	-11.999	29.845	40.2	Pass
T1	245 - 240	Top Girt	C7x9.8	4	-1.181	42.226	2.8	Pass
T10	80 - 60	Redund Horz 1 Bracing	L3x3x1/4	178	-4.505	32.056	14.1	Pass
T11	60 - 40	Redund Horz 1 Bracing	L3x3x1/4	229	-5.013	28.673	17.5	Pass
T12	40 - 20	Redund Horz 1 Bracing	L3x3x3/8	280	-5.538	36.261	15.3	Pass
T13	20 - 0	Redund Horz 1 Bracing	L3x3x3/8	331	-6.084	31.245	19.5	Pass
T10	80 - 60	Redund Diag 1 Bracing	L3x3x1/4	179	-2.861	20.631	13.9	Pass
T11	60 - 40	Redund Diag 1 Bracing	L3x3x1/4	230	-3.087	19.070	16.2	Pass
T12	40 - 20	Redund Diag 1 Bracing	L3x3x1/4	285	-3.323	17.580	18.9	Pass
T13	20 - 0	Redund Diag 1 Bracing	L3x3x1/4	336	-3.573	15.807	22.6	Pass
T10	80 - 60	Inner Bracing	L3x3x3/16	189	-0.011	5.612	0.2	Pass
T11	60 - 40	Inner Bracing	L3x3 1/2x1/4	240	-0.012	7.670	0.3	Pass
T12	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	291	-0.016	8.667	0.3	Pass
T13	20 - 0	Inner Bracing	L3 1/2x4x1/4	342	-0.016	9.045	0.3	Pass
							Summary	
						Leg (T13)	39.1	Pass
						Diagonal (T13)	55.4	Pass
						Horizontal (T11)	43.4	Pass
						Top Girt (T1)	2.8	Pass
						Redund Horz 1 Bracing (T13)	19.5	Pass
						Redund Diag 1 Bracing (T13)	22.6	Pass
						Inner Bracing (T13)	0.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Bolt Checks	45.9	Pass
						Rating =	55.4	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	24.6	Pass
1,2	Base Foundation (Structure)	Base	20.8	Pass
1,2	Base Foundation (Soil Interaction)	Base	27.8	Pass

Structure Rating (max from all components) =	55.4%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H Section 15.5

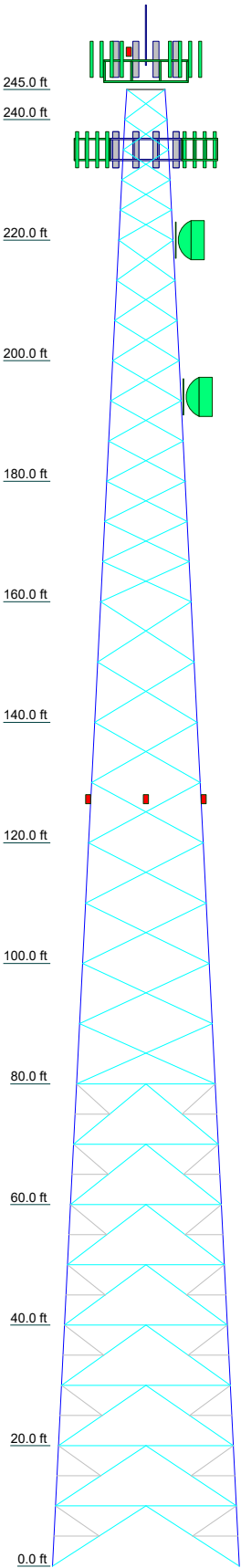
4.1) Recommendations

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	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Sabre 12.75"x0.5"		Sabre 10.75"x0.5"	D	E	D		Sabre 8.625"x0.5"					A
Leg Grade													
Diagonals	L4x4x3/8			L4x4x1/4		L4x4x3/8		L3 1/2x3 1/2x3/8					F
Diagonal Grade													
Top Girts													G
Horizontals	L5x5x5/16			L4x4x3/8									
Red. Horizontals	L3x3x3/8			L3x3x1/4									
Red. Diagonals													
Inner Bracing	L3 1/2x4x1/4	L3 1/2x3 1/2x1/4	L3x3 1/2x1/4	L3x3x3/16									
Face Width (ft)	31	29	27	25	23	21	19	17	15	13	11	9	6.4 @ 104
# Panels @ (ft)													5 @ 5
Weight (K)	70.1	10.1	9.7	7.9	6.8	6.0	4.9	4.7	4.2	3.6	2.3	2.3	0.5



ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 366 K
SHEAR: 41 K

UPLIFT: -287 K
SHEAR: 33 K

AXIAL
107 K

SHEAR
65 K

MOMENT
8963 kip-ft

TORQUE 42 kip-ft
REACTIONS - 118 mph WIND

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Sabre 3.5"x0.216"	E	Sabre 8.625" x 0.718"
B	Sabre 5.5625" x 0.5"	F	L1 3/4x1 3/4x1/4
C	Sabre 5.5625" x 0.625"	G	C7x9.8
D	Sabre 8.625" x 0.593"		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Columbia County, Florida.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0'
7. TIA-222-H Annex S
8. TOWER RATING: 55.4%

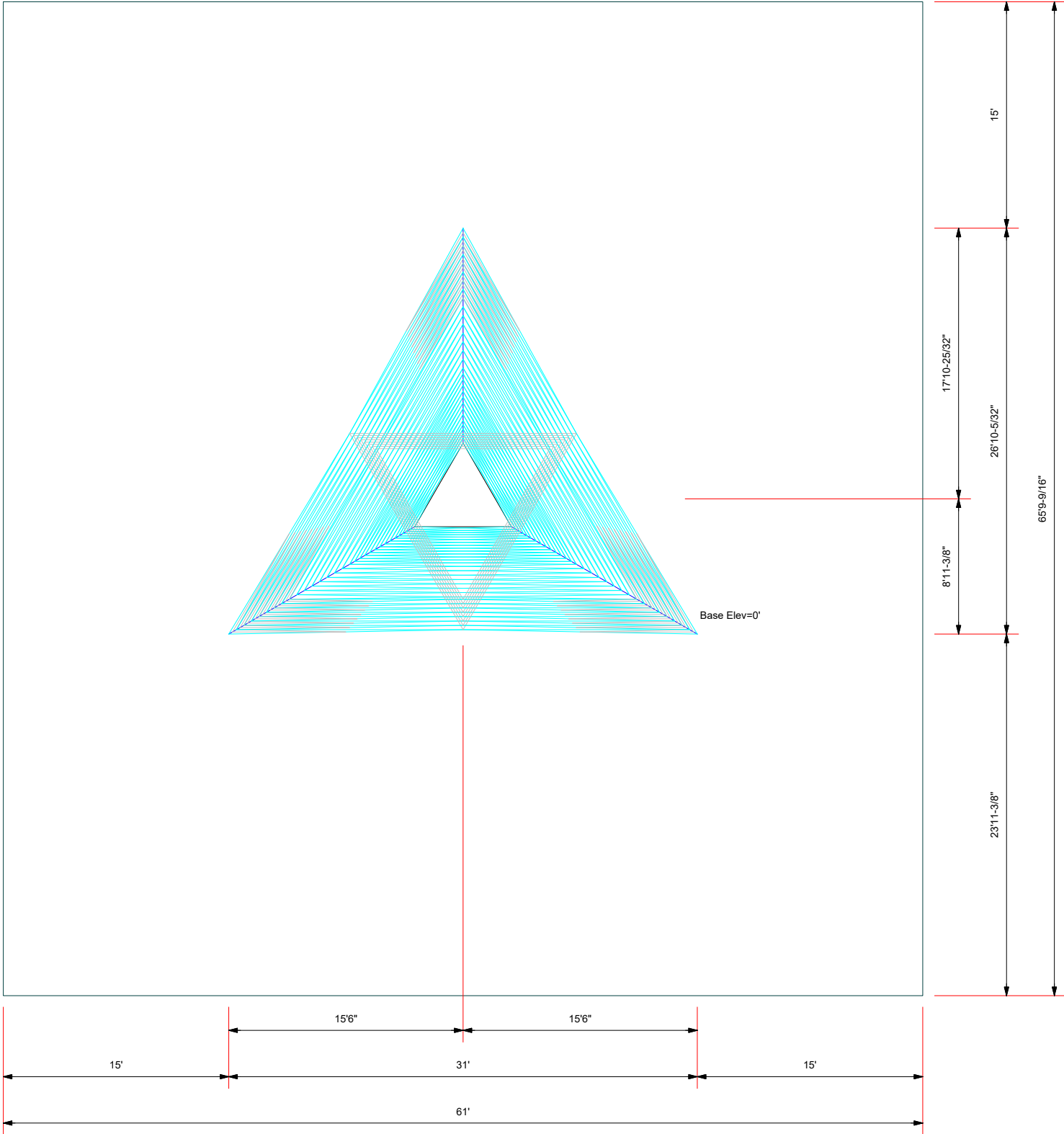


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Job: **105292.004.01 - OSCEOLA, FL (BU# 846215)**

Project:	Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 12/03/21	Scale: NTS	Dwg No. E-1
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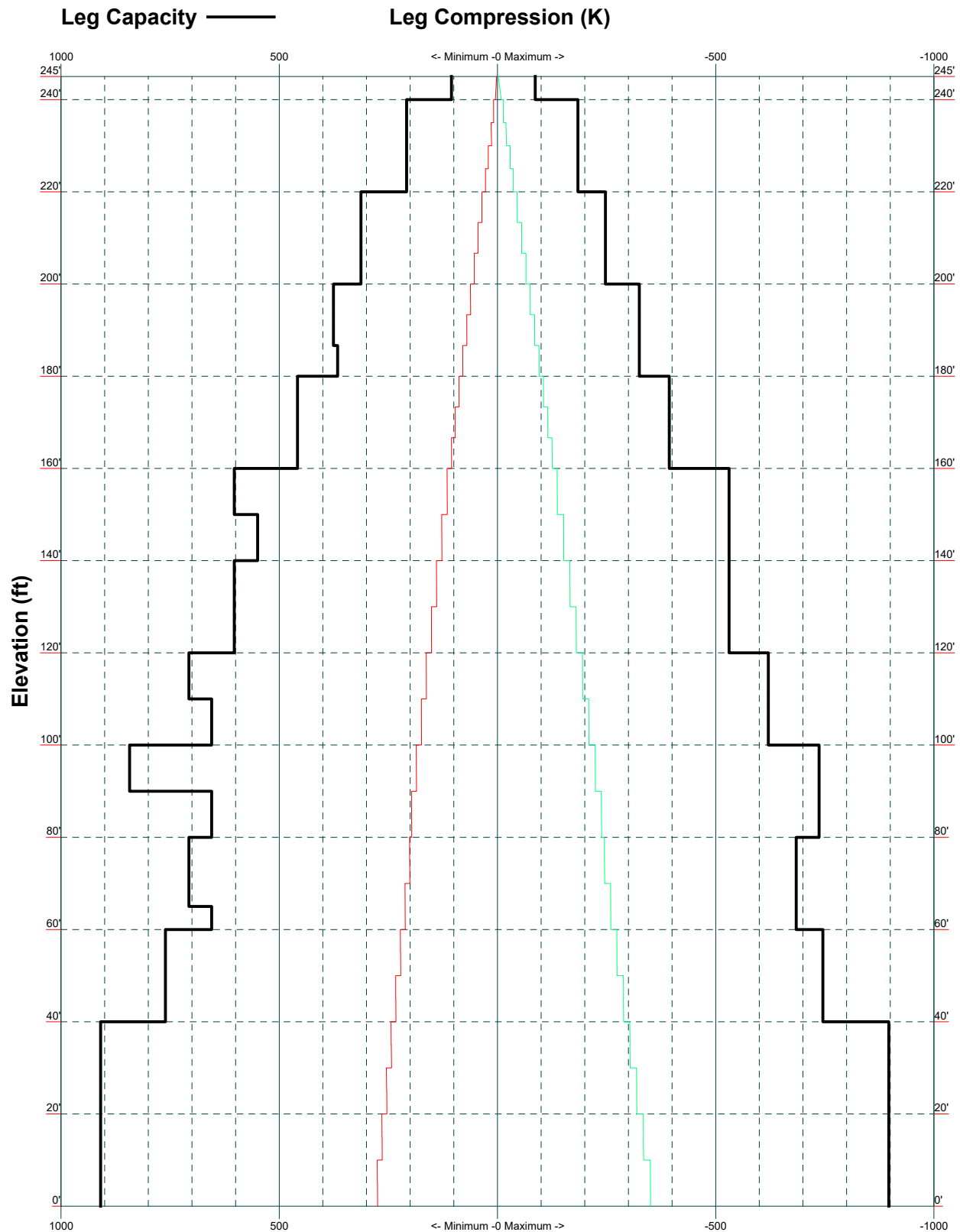
Plot Plan
Total Area - 0.09 Acres



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Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 12/03/21	Scale: NTS
Path:	Dwg No. E-2	

TIA-222-H - 118 mph Exposure B



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Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 12/03/21	Scale: NTS
Path:	Dwg No. E-3	

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TIA-222-H - 118 mph Exposure B

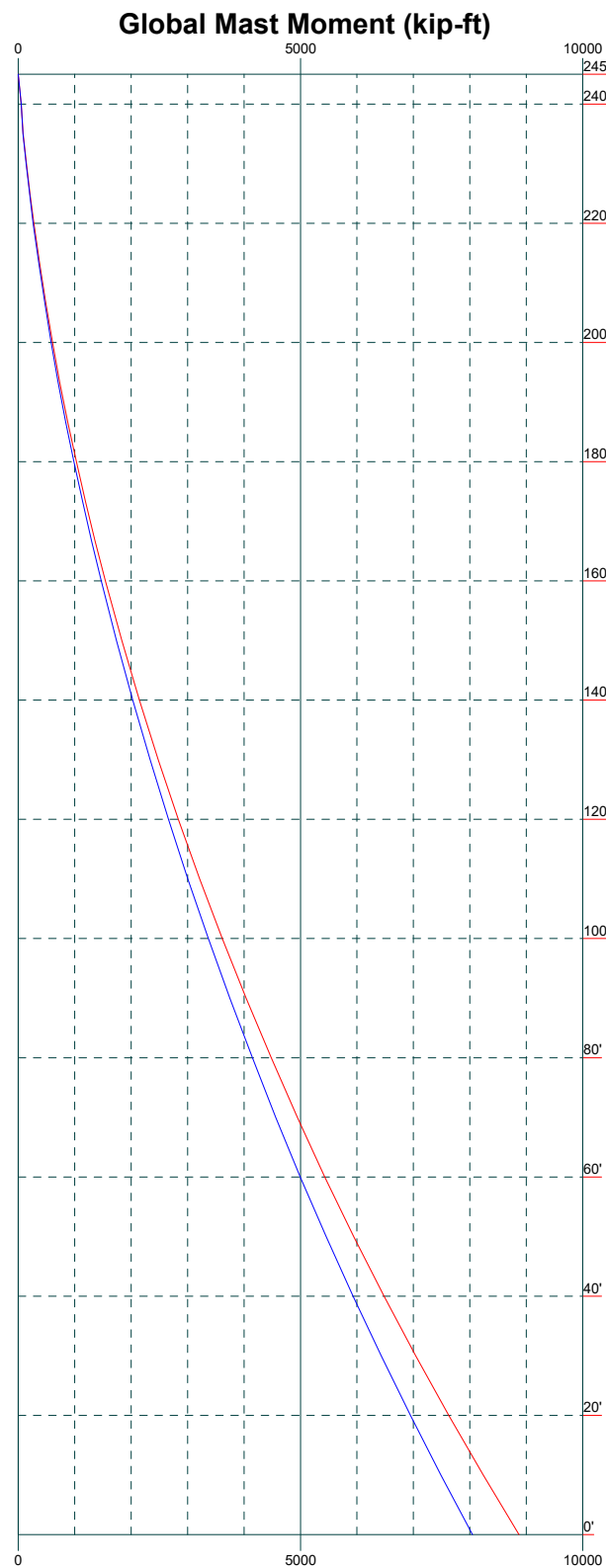
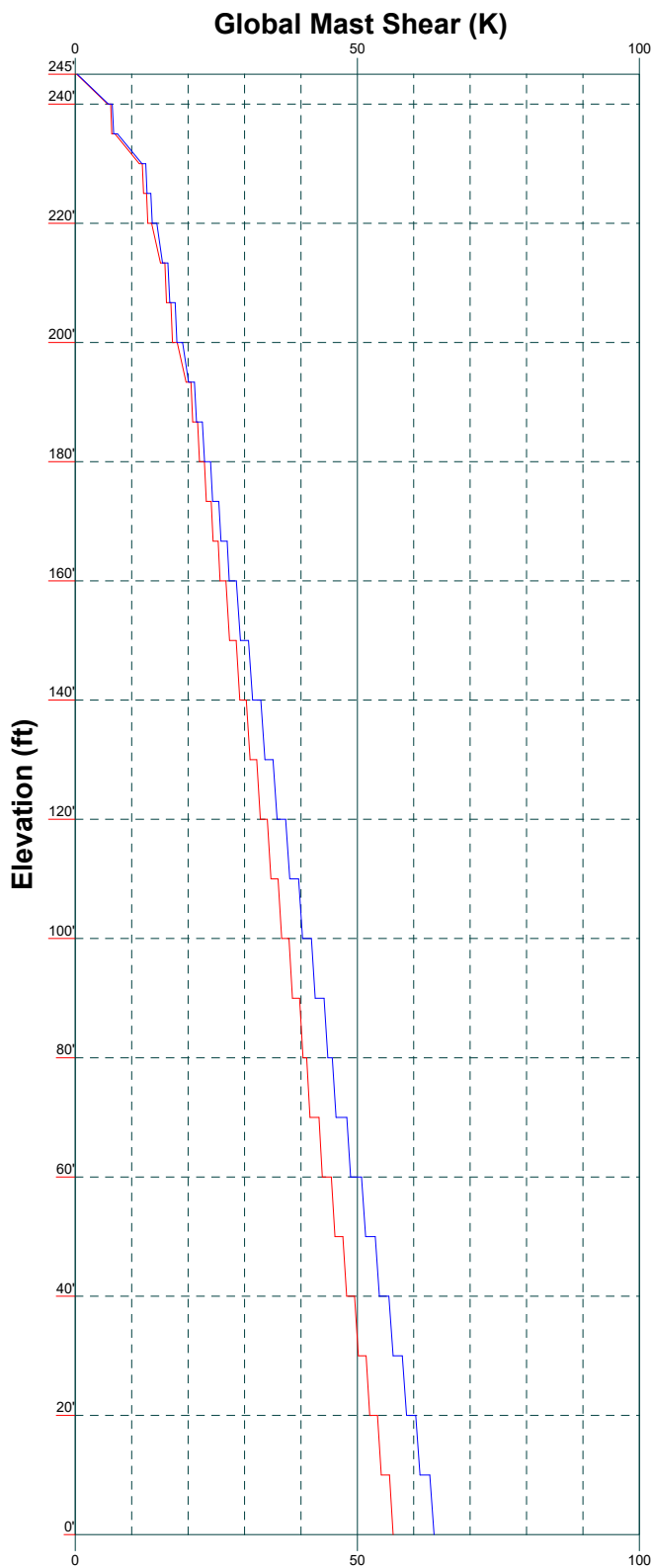
Maximum Values

Vx

Vz

Mx

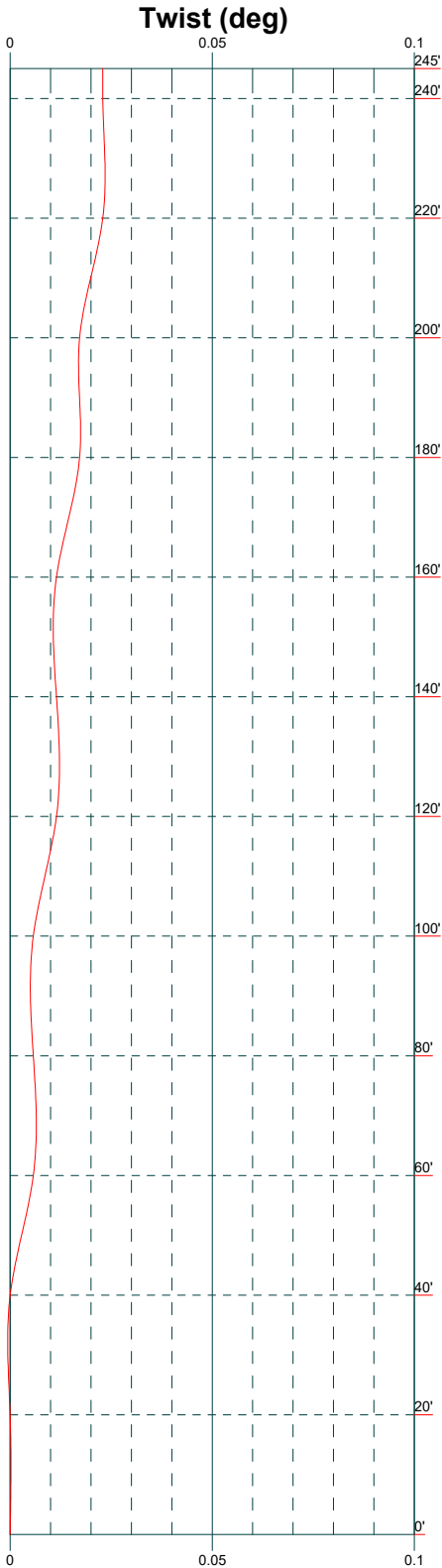
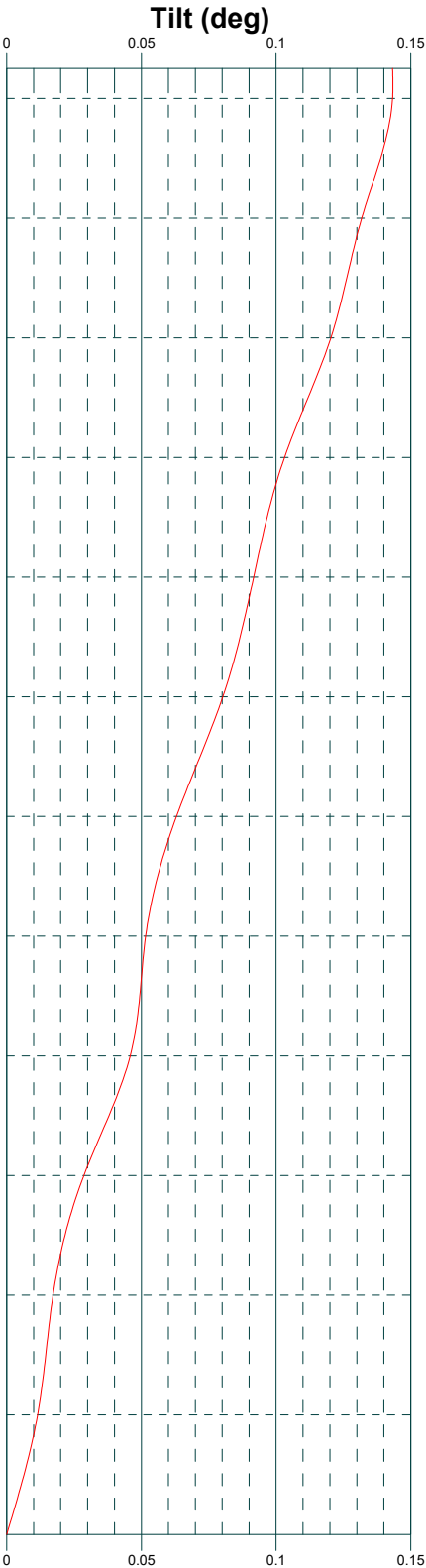
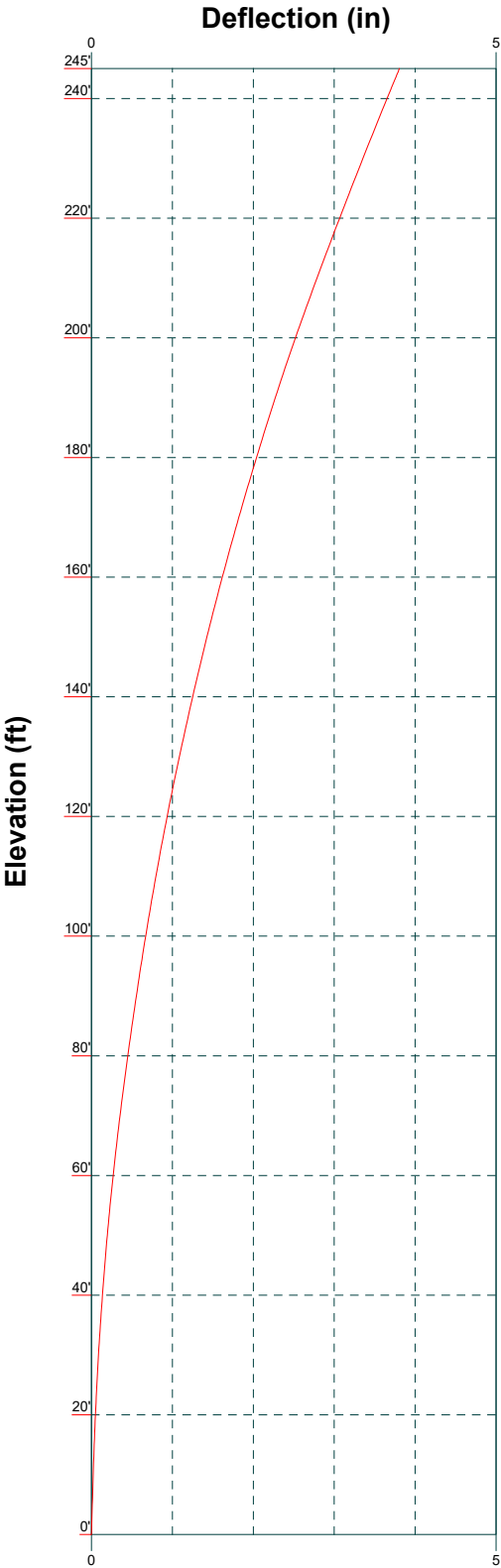
Mz



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Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 12/03/21	Scale: NTS
Path:	Dwg No. E-4	

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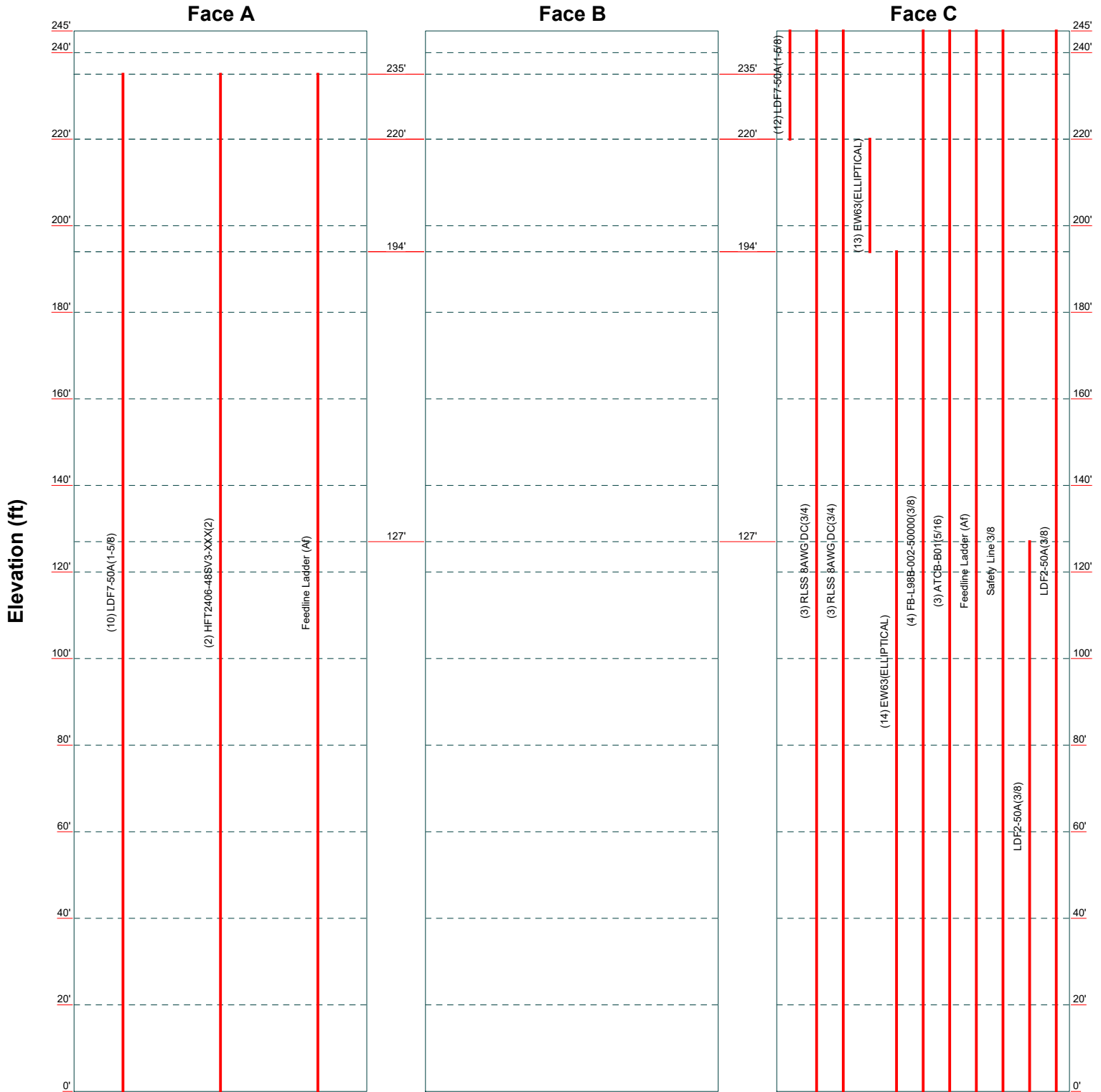
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Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 12/03/21	Scale: NTS
Path:	Dwg No. E-5	

Feed Line Distribution Chart

0' - 245'

Round Flat App In Face App Out Face Truss Leg



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Project:			
Client:	Crown Castle	Drawn by:	Jayaraj B
Code:	TIA-222-H	Date:	12/03/21
Path:			
		App'd:	
		Scale:	NTS
		Dwg No.	E-7

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	Project	Date 17:18:33 12/03/21
	Client Crown Castle	Designed by Jayaraj B

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 245' above the ground line.

The base of the tower is set at an elevation of 0' above the ground line.

The face width of the tower is 6'4-13/16" at the top and 31' 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: 157'.

Basic wind speed of 118 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0'.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

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: $K_{cs}(F_w) = 0.95$.

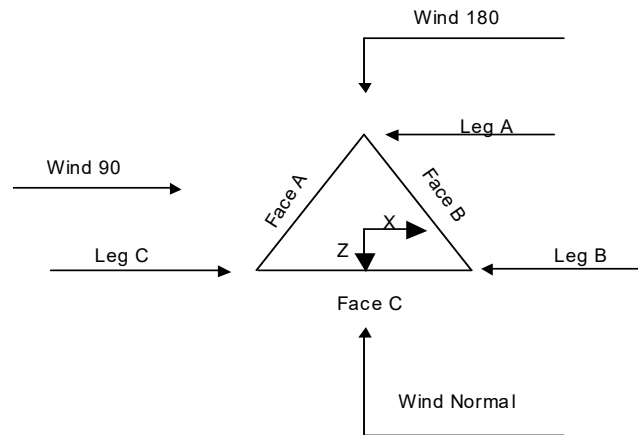
Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	Project	Date 17:18:33 12/03/21
	Client Crown Castle	Designed by Jayaraj B



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	245'-240'			6'4-13/16"	1	5'
T2	240'-220'			7'	1	20'
T3	220'-200'			9'	1	20'
T4	200'-180'			11'	1	20'
T5	180'-160'			13'	1	20'
T6	160'-140'			15'	1	20'
T7	140'-120'			17'	1	20'
T8	120'-100'			19'	1	20'
T9	100'-80'			21'	1	20'
T10	80'-60'			23'	1	20'
T11	60'-40'			25'	1	20'
T12	40'-20'			27'	1	20'
T13	20'-0'			29'	1	20'

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	245'-240'	5'	X Brace	No	No	0.000	0.000
T2	240'-220'	5'	X Brace	No	No	0.000	0.000

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	Project	Date
	Client	Designed by
	Crown Castle	Jayaraj B

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
T3	220'-200'	6'8"	X Brace	No	No	0.000	0.000
T4	200'-180'	6'8"	X Brace	No	No	0.000	0.000
T5	180'-160'	6'8"	X Brace	No	No	0.000	0.000
T6	160'-140'	10'	X Brace	No	No	0.000	0.000
T7	140'-120'	10'	X Brace	No	No	0.000	0.000
T8	120'-100'	10'	X Brace	No	No	0.000	0.000
T9	100'-80'	10'	X Brace	No	No	0.000	0.000
T10	80'-60'	10'	K1 Down	No	Yes	0.000	0.000
T11	60'-40'	10'	K1 Down	No	Yes	0.000	0.000
T12	40'-20'	10'	K1 Down	No	Yes	0.000	0.000
T13	20'-0'	10'	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 245'-240'	Pipe	Sabre 3.5"x0.216"	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T2 240'-220'	Pipe	Sabre 4.5" x 0.337"	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T3 220'-200'	Pipe	Sabre 4.5"x0.5310"	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 200'-180'	Pipe	Sabre 5.5625" x 0.5"	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T5 180'-160'	Pipe	Sabre 5.5625" x 0.625"	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T6 160'-140'	Pipe	Sabre 8.625"x0.5"	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)
T7 140'-120'	Pipe	Sabre 8.625"x0.5"	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)
T8 120'-100'	Pipe	Sabre 8.625" x 0.593"	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T9 100'-80'	Pipe	Sabre 8.625" x 0.718"	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T10 80'-60'	Pipe	Sabre 8.625" x 0.593"	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T11 60'-40'	Pipe	Sabre 10.75"x0.5"	A572-50 (50 ksi)	Single Angle	L3 1/2x4x5/16	A36 (36 ksi)
T12 40'-20'	Pipe	Sabre 12.75"x0.5"	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T13 20'-0'	Pipe	Sabre 12.75"x0.5"	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 245'-240'	Channel	C7x9.8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

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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
T10 80'-60'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T11 60'-40'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T12 40'-20'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T13 20'-0'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L5x5x5/16	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
T10 80'-60'	Solid Round		A36 (36 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T11 60'-40'	Solid Round		A36 (36 ksi)	Single Angle	L3x3 1/2x1/4	A36 (36 ksi)
T12 40'-20'	Solid Round		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 20'-0'	Solid Round		A36 (36 ksi)	Single Angle	L3 1/2x4x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Redundant Bracing Grade	Redundant Type	Redundant Size	K Factor
T10 80'-60'	A36 (36 ksi)	Horizontal (1)	Equal Angle L3x3x1/4	1
T11 60'-40'	A36 (36 ksi)	Diagonal (1)	Equal Angle L3x3x1/4	1
T12 40'-20'	A36 (36 ksi)	Horizontal (1)	Equal Angle L3x3x1/4	1
T13 20'-0'	A36 (36 ksi)	Diagonal (1)	Equal Angle L3x3x3/8	1
		Horizontal (1)	Equal Angle L3x3x1/4	1
		Diagonal (1)	Equal Angle L3x3x3/8	1
		Horizontal (1)	Equal Angle L3x3x1/4	1

Tower Section Geometry (cont'd)

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 245'-240'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T2 240'-220'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T3 220'-200'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T4 200'-180'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T5 180'-160'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T6 160'-140'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T7 140'-120'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T8 120'-100'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T9 100'-80'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T10 80'-60'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T11 60'-40'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T12 40'-20'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000
T13 20'-0'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	0.000

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 Y	X Y	X Y	X Y	X Y	X Y	X Y
ft										
T1 245'-240'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 240'-220'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 220'-200'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 200'-180'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 180'-160'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 160'-140'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 140'-120'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 120'-100'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 100'-80'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 80'-60'	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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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 245'-240'	Flange	1.000	4	0.625	1	0.625	3	0.625	0	0.625	0	0.625	0	0.625	0
		A325N		A325X		A325X		A325N		A325N		A325X		A325N	
T2 240'-220'	Flange	1.000	4	0.625	1	0.625	0	0.625	0	0.625	0	0.625	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T3 220'-200'	Flange	1.250	4	0.625	1	0.625	0	0.625	0	0.625	0	0.625	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T4 200'-180'	Flange	1.250	4	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T5 180'-160'	Flange	1.250	6	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T6 160'-140'	Flange	1.250	6	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T7 140'-120'	Flange	1.375	6	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T8 120'-100'	Flange	1.375	6	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T9 100'-80'	Flange	1.375	6	0.750	1	0.625	0	0.625	0	0.625	0	0.750	0	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T10 80'-60'	Flange	1.375	6	0.625	2	0.625	0	0.625	0	0.625	0	0.625	2	0.625	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T11 60'-40'	Flange	1.750	6	0.625	2	0.625	0	0.625	0	0.625	0	0.625	2	0.625	0
		A449		A325X		A325N		A325N		A325N		A325X		A325N	
T12 40'-20'	Flange	1.750	6	0.750	2	0.625	0	0.625	0	0.625	0	0.750	2	0.625	0
		A449		A325X		A325N		A325N		A325N		A325X		A325N	
T13 20'-0'	Flange	1.750	0	0.750	2	0.625	0	0.625	0	0.625	0	0.750	2	0.625	0
		A36		A325X		A325N		A325N		A325N		A325X		A325N	

Tower Section Geometry (cont'd)

[illegible]

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Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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.
T8 120'-100'	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 100'-80'	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 80'-60'	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T11 60'-40'	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T12 40'-20'	0.750 A325N	1	0.750 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T13 20'-0'	0.750 A325N	1	0.750 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF7-50A(1-5/8)	A	No	No	Ar (CaAa)	235' - 0'	0.000	0.4	10	6	0.850 0.750	1.980		0.001
HFT2406-48S	A	No	No	Ar (CaAa)	235' - 0'	2.000	0.415	2	2	0.850 0.750	2.000		0.003
V3-XXX(2) Feedline Ladder (Af) *	A	No	No	Af (CaAa)	235' - 0'	0.000	0.4	1	1	3.000	3.000		0.008
LDF7-50A(1-5/8)	C	No	No	Ar (CaAa)	245' - 220'	0.000	-0.1	12	8	0.850 0.750	1.980		0.001
RLSS 8AWG DC(3/4)	C	No	No	Ar (CaAa)	245' - 0'	2.000	-0.075	3	2	0.850 0.750	0.735		0.000
RLSS 8AWG DC(3/4)	C	No	No	Ar (CaAa)	245' - 0'	0.000	-0.13	3	1	0.850 0.750	0.735		0.000
EW63(ELLIP TICAL)	C	No	No	Ar (CaAa)	220' - 194'	0.000	-0.1	13	9	0.850 0.750	2.010		0.001
EW63(ELLIP TICAL)	C	No	No	Ar (CaAa)	194' - 0'	0.000	-0.1	14	10	0.850 0.750	2.010		0.001
FB-L98B-002- 50000(3/8)	C	No	No	Ar (CaAa)	245' - 0'	2.000	-0.095	4	2	0.850 0.750	0.394		0.000
ATCB-B01(5/ 16) Feedline Ladder (Af) *	C	No	No	Ar (CaAa)	245' - 0'	0.000	-0.15	3	3	0.850 0.750	0.315		0.000
	C	No	No	Af (CaAa)	245' - 0'	0.000	-0.1	1	1	3.000	3.000		0.008
Safety Line 3/8 *	C	No	No	Ar (CaAa)	245' - 0'	0.000	0.5	1	1	0.375	0.375		0.000
LDF2-50A(3/ 8)	C	No	No	Ar (CaAa)	127' - 0'	0.000	0.5	1	1	0.250	0.440		0.000
LDF2-50A(3/ 8) *	C	No	No	Ar (CaAa)	245' - 0'	0.000	0.5	1	1	0.250	0.440		0.000

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Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight klf
*								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	245'-240'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	18.252	0.000	0.110
T2	240'-220'	A	0.000	0.000	43.200	0.000	0.342
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	73.010	0.000	0.438
T3	220'-200'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	77.750	0.000	0.374
T4	200'-180'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	80.564	0.000	0.381
T5	180'-160'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	81.770	0.000	0.384
T6	160'-140'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	81.770	0.000	0.384
T7	140'-120'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.078	0.000	0.385
T8	120'-100'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386
T9	100'-80'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386
T10	80'-60'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386
T11	60'-40'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386
T12	40'-20'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386
T13	20'-0'	A	0.000	0.000	57.600	0.000	0.456
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.650	0.000	0.386

Feed Line Center of Pressure

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	Crown Castle	Jayaraj B

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice	Ice
				in	in
T1	245'-240'	2.410	5.846	2.410	5.846
T2	240'-220'	1.978	-4.982	1.955	-4.910
T3	220'-200'	2.337	-9.442	2.308	-9.306
T4	200'-180'	2.660	-9.929	2.592	-9.625
T5	180'-160'	3.022	-10.898	2.949	-10.583
T6	160'-140'	3.422	-12.106	3.188	-11.133
T7	140'-120'	3.592	-12.956	3.347	-11.916
T8	120'-100'	3.429	-12.909	3.216	-11.965
T9	100'-80'	3.636	-13.608	3.412	-12.627
T10	80'-60'	3.219	-11.977	3.072	-11.336
T11	60'-40'	3.380	-12.451	3.196	-11.664
T12	40'-20'	3.227	-11.792	3.056	-11.068
T13	20'-0'	3.329	-12.134	3.156	-11.402

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	6	LDF7-50A(1-5/8)	240.00 - 245.00	0.6000	0.6000
T1	7	RLSS 8AWG DC(3/4)	240.00 - 245.00	0.6000	0.6000
T1	8	RLSS 8AWG DC(3/4)	240.00 - 245.00	0.6000	0.6000
T1	11	FB-L98B-002-50000(3/8)	240.00 - 245.00	0.6000	0.6000
T1	12	ATCB-B01(5/16)	240.00 - 245.00	0.6000	0.6000
T1	13	Feedline Ladder (Af)	240.00 - 245.00	0.6000	0.6000
T1	15	Safety Line 3/8	240.00 - 245.00	0.6000	0.6000
T1	18	LDF2-50A(3/8)	240.00 - 245.00	0.6000	0.6000
T2	2	LDF7-50A(1-5/8)	220.00 - 235.00	0.6000	0.6000
T2	3	HFT2406-48SV3-XXX(2)	220.00 - 235.00	0.6000	0.6000
T2	4	Feedline Ladder (Af)	220.00 - 235.00	0.6000	0.6000
T2	6	LDF7-50A(1-5/8)	220.00 - 240.00	0.6000	0.6000
T2	7	RLSS 8AWG DC(3/4)	220.00 - 240.00	0.6000	0.6000
T2	8	RLSS 8AWG DC(3/4)	220.00 - 240.00	0.6000	0.6000
T2	11	FB-L98B-002-50000(3/8)	220.00 - 240.00	0.6000	0.6000
T2	12	ATCB-B01(5/16)	220.00 - 240.00	0.6000	0.6000
T2	13	Feedline Ladder (Af)	220.00 - 240.00	0.6000	0.6000
T2	15	Safety Line 3/8	220.00 - 240.00	0.6000	0.6000

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	Crown Castle	Jayaraj B

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_o No Ice</i>	<i>K_o Ice</i>
T2	18	LDF2-50A(3/8)	220.00 - 240.00	0.6000	0.6000
T3	2	LDF7-50A(1-5/8)	200.00 - 220.00	0.6000	0.6000
T3	3	HFT2406-48SV3-XXX(2)	200.00 - 220.00	0.6000	0.6000
T3	4	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T3	7	RLSS 8AWG DC(3/4)	200.00 - 220.00	0.6000	0.6000
T3	8	RLSS 8AWG DC(3/4)	200.00 - 220.00	0.6000	0.6000
T3	9	EW63(ELLIPTICAL)	200.00 - 220.00	0.6000	0.6000
T3	11	FB-L98B-002-50000(3/8)	200.00 - 220.00	0.6000	0.6000
T3	12	ATCB-B01(5/16)	200.00 - 220.00	0.6000	0.6000
T3	13	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T3	15	Safety Line 3/8	200.00 - 220.00	0.6000	0.6000
T3	18	LDF2-50A(3/8)	200.00 - 220.00	0.6000	0.6000
T4	2	LDF7-50A(1-5/8)	180.00 - 200.00	0.6000	0.6000
T4	3	HFT2406-48SV3-XXX(2)	180.00 - 200.00	0.6000	0.6000
T4	4	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T4	7	RLSS 8AWG DC(3/4)	180.00 - 200.00	0.6000	0.6000
T4	8	RLSS 8AWG DC(3/4)	180.00 - 200.00	0.6000	0.6000
T4	9	EW63(ELLIPTICAL)	194.00 - 200.00	0.6000	0.6000
T4	10	EW63(ELLIPTICAL)	180.00 - 194.00	0.6000	0.6000
T4	11	FB-L98B-002-50000(3/8)	180.00 - 200.00	0.6000	0.6000
T4	12	ATCB-B01(5/16)	180.00 - 200.00	0.6000	0.6000
T4	13	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T4	15	Safety Line 3/8	180.00 - 200.00	0.6000	0.6000
T4	18	LDF2-50A(3/8)	180.00 - 200.00	0.6000	0.6000
T5	2	LDF7-50A(1-5/8)	160.00 - 180.00	0.6000	0.6000
T5	3	HFT2406-48SV3-XXX(2)	160.00 - 180.00	0.6000	0.6000
T5	4	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T5	7	RLSS 8AWG DC(3/4)	160.00 - 180.00	0.6000	0.6000
T5	8	RLSS 8AWG DC(3/4)	160.00 - 180.00	0.6000	0.6000
T5	10	EW63(ELLIPTICAL)	160.00 - 180.00	0.6000	0.6000
T5	11	FB-L98B-002-50000(3/8)	160.00 - 180.00	0.6000	0.6000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _o No Ice	K _o Ice
T5	12	ATCB-B01(5/16)	160.00 - 180.00	0.6000	0.6000
T5	13	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T5	15	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T5	18	LDF2-50A(3/8)	160.00 - 180.00	0.6000	0.6000
T6	2	LDF7-50A(1-5/8)	140.00 - 160.00	0.6000	0.6000
T6	3	HFT2406-48SV3-XXX(2)	140.00 - 160.00	0.6000	0.6000
T6	4	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T6	7	RLSS 8AWG DC(3/4)	140.00 - 160.00	0.6000	0.6000
T6	8	RLSS 8AWG DC(3/4)	140.00 - 160.00	0.6000	0.6000
T6	10	EW63(ELLIPTICAL)	140.00 - 160.00	0.6000	0.6000
T6	11	FB-L98B-002-50000(3/8)	140.00 - 160.00	0.6000	0.6000
T6	12	ATCB-B01(5/16)	140.00 - 160.00	0.6000	0.6000
T6	13	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T6	15	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T6	18	LDF2-50A(3/8)	140.00 - 160.00	0.6000	0.6000
T7	2	LDF7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T7	3	HFT2406-48SV3-XXX(2)	120.00 - 140.00	0.6000	0.6000
T7	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T7	7	RLSS 8AWG DC(3/4)	120.00 - 140.00	0.6000	0.6000
T7	8	RLSS 8AWG DC(3/4)	120.00 - 140.00	0.6000	0.6000
T7	10	EW63(ELLIPTICAL)	120.00 - 140.00	0.6000	0.6000
T7	11	FB-L98B-002-50000(3/8)	120.00 - 140.00	0.6000	0.6000
T7	12	ATCB-B01(5/16)	120.00 - 140.00	0.6000	0.6000
T7	13	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T7	15	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T7	17	LDF2-50A(3/8)	120.00 - 127.00	0.6000	0.6000
T7	18	LDF2-50A(3/8)	120.00 - 140.00	0.6000	0.6000
T8	2	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T8	3	HFT2406-48SV3-XXX(2)	100.00 - 120.00	0.6000	0.6000
T8	4	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T8	7	RLSS 8AWG DC(3/4)	100.00 - 120.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_o No Ice</i>	<i>K_o Ice</i>
T8	8	RLSS 8AWG DC(3/4)	100.00 - 120.00	0.6000	0.6000
T8	10	EW63(ELLIPTICAL)	100.00 - 120.00	0.6000	0.6000
T8	11	FB-L98B-002-50000(3/8)	100.00 - 120.00	0.6000	0.6000
T8	12	ATCB-B01(5/16)	100.00 - 120.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T8	15	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T8	17	LDF2-50A(3/8)	100.00 - 120.00	0.6000	0.6000
T8	18	LDF2-50A(3/8)	100.00 - 120.00	0.6000	0.6000
T9	2	LDF7-50A(1-5/8)	80.00 - 100.00	0.6000	0.6000
T9	3	HFT2406-48SV3-XXX(2)	80.00 - 100.00	0.6000	0.6000
T9	4	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T9	7	RLSS 8AWG DC(3/4)	80.00 - 100.00	0.6000	0.6000
T9	8	RLSS 8AWG DC(3/4)	80.00 - 100.00	0.6000	0.6000
T9	10	EW63(ELLIPTICAL)	80.00 - 100.00	0.6000	0.6000
T9	11	FB-L98B-002-50000(3/8)	80.00 - 100.00	0.6000	0.6000
T9	12	ATCB-B01(5/16)	80.00 - 100.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T9	15	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T9	17	LDF2-50A(3/8)	80.00 - 100.00	0.6000	0.6000
T9	18	LDF2-50A(3/8)	80.00 - 100.00	0.6000	0.6000
T10	2	LDF7-50A(1-5/8)	60.00 - 80.00	0.6000	0.6000
T10	3	HFT2406-48SV3-XXX(2)	60.00 - 80.00	0.6000	0.6000
T10	4	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	7	RLSS 8AWG DC(3/4)	60.00 - 80.00	0.6000	0.6000
T10	8	RLSS 8AWG DC(3/4)	60.00 - 80.00	0.6000	0.6000
T10	10	EW63(ELLIPTICAL)	60.00 - 80.00	0.6000	0.6000
T10	11	FB-L98B-002-50000(3/8)	60.00 - 80.00	0.6000	0.6000
T10	12	ATCB-B01(5/16)	60.00 - 80.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	15	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T10	17	LDF2-50A(3/8)	60.00 - 80.00	0.6000	0.6000
T10	18	LDF2-50A(3/8)	60.00 - 80.00	0.6000	0.6000
T11	2	LDF7-50A(1-5/8)	40.00 - 60.00	0.6000	0.6000
T11	3	HFT2406-48SV3-XXX(2)	40.00 - 60.00	0.6000	0.6000
T11	4	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	7	RLSS 8AWG DC(3/4)	40.00 - 60.00	0.6000	0.6000
T11	8	RLSS 8AWG DC(3/4)	40.00 - 60.00	0.6000	0.6000
T11	10	EW63(ELLIPTICAL)	40.00 - 60.00	0.6000	0.6000
T11	11	FB-L98B-002-50000(3/8)	40.00 - 60.00	0.6000	0.6000
T11	12	ATCB-B01(5/16)	40.00 - 60.00	0.6000	0.6000
T11	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	15	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T11	17	LDF2-50A(3/8)	40.00 - 60.00	0.6000	0.6000
T11	18	LDF2-50A(3/8)	40.00 - 60.00	0.6000	0.6000
T12	2	LDF7-50A(1-5/8)	20.00 - 40.00	0.6000	0.6000
T12	3	HFT2406-48SV3-XXX(2)	20.00 - 40.00	0.6000	0.6000
T12	4	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	7	RLSS 8AWG DC(3/4)	20.00 - 40.00	0.6000	0.6000
T12	8	RLSS 8AWG DC(3/4)	20.00 - 40.00	0.6000	0.6000
T12	10	EW63(ELLIPTICAL)	20.00 - 40.00	0.6000	0.6000
T12	11	FB-L98B-002-50000(3/8)	20.00 - 40.00	0.6000	0.6000
T12	12	ATCB-B01(5/16)	20.00 - 40.00	0.6000	0.6000
T12	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	15	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _o No Ice	K _o Ice
T12	17	LDF2-50A(3/8)	20.00 - 40.00	0.6000	0.6000
T12	18	LDF2-50A(3/8)	20.00 - 40.00	0.6000	0.6000
T13	2	LDF7-50A(1-5/8)	0.00 - 20.00	0.6000	0.6000
T13	3	HFT2406-48SV3-XXX(2)	0.00 - 20.00	0.6000	0.6000
T13	4	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	7	RLSS 8AWG DC(3/4)	0.00 - 20.00	0.6000	0.6000
T13	8	RLSS 8AWG DC(3/4)	0.00 - 20.00	0.6000	0.6000
T13	10	EW63(ELLIPTICAL)	0.00 - 20.00	0.6000	0.6000
T13	11	FB-L98B-002-50000(3/8)	0.00 - 20.00	0.6000	0.6000
T13	12	ATCB-B01(5/16)	0.00 - 20.00	0.6000	0.6000
T13	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	15	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T13	17	LDF2-50A(3/8)	0.00 - 20.00	0.6000	0.6000
T13	18	LDF2-50A(3/8)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Sabre Top Hat	C	None		0.000	247'6"	No Ice	5.500	5.500	0.775
Lightning Rod 5/8" x 3' on 5' Pole	A	From Leg	0.000 0' 4'	0.000	250'	No Ice	1.375	1.375	0.043
Flash Beacon Lighting	C	From Leg	0.000 0' 6"	0.000	250'	No Ice	2.700	2.700	0.050
Side Lighting	A	From Leg	0.500 0' 0'	0.000	126'6"	No Ice	0.133	0.133	0.005
Side Lighting	B	From Leg	0.500 0' 0'	0.000	126'6"	No Ice	0.133	0.133	0.005
Side Lighting	C	From Leg	0.500 0' 0'	0.000	126'6"	No Ice	0.133	0.133	0.005
*									
(2) DB878G105AXY w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	248'	No Ice	8.710	5.760	0.076
(2) DB878G105AXY w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	248'	No Ice	8.710	5.760	0.076
(2) DB878G105AXY w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	248'	No Ice	8.710	5.760	0.076
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	248'	No Ice	4.090	3.300	0.066
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0'	0.000	248'	No Ice	4.090	3.300	0.066

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	2' 4.000 0'	0.000	248'	No Ice	4.090	3.300	0.066
NNHH-65B-R4 w/ Mount Pipe	A	From Leg	2' 4.000 0'	0.000	248'	No Ice	7.550	4.230	0.110
NNHH-65B-R4 w/ Mount Pipe	B	From Leg	2' 4.000 0'	0.000	248'	No Ice	7.550	4.230	0.110
NNHH-65B-R4 w/ Mount Pipe	C	From Leg	2' 4.000 0'	0.000	248'	No Ice	7.550	4.230	0.110
(2) LGP 17401	A	From Leg	2' 4.000 0'	0.000	248'	No Ice	0.822	0.470	0.017
(2) LGP 17401	B	From Leg	3' 4.000 0'	0.000	248'	No Ice	0.822	0.470	0.017
(2) LGP 17401	C	From Leg	3' 4.000 0'	0.000	248'	No Ice	0.822	0.470	0.017
RRUS 4478 B14	A	From Leg	3' 4.000 0'	0.000	248'	No Ice	1.843	1.059	0.060
RRUS 4478 B14	B	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.843	1.059	0.060
RRUS 4478 B14	C	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.843	1.059	0.060
RRUS 32	A	From Leg	2' 4.000 0'	0.000	248'	No Ice	2.857	1.777	0.055
RRUS 32	B	From Leg	3' 4.000 0'	0.000	248'	No Ice	2.857	1.777	0.055
RRUS 32	C	From Leg	3' 4.000 0'	0.000	248'	No Ice	2.857	1.777	0.055
RRUS 4449 B5/B12	A	From Leg	3' 4.000 0'	0.000	248'	No Ice	1.968	1.408	0.071
RRUS 4449 B5/B12	B	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.968	1.408	0.071
RRUS 4449 B5/B12	C	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.968	1.408	0.071
RRUS 8843 B2/B66A	A	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.639	1.353	0.072
RRUS 8843 B2/B66A	B	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.639	1.353	0.072
RRUS 8843 B2/B66A	C	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.639	1.353	0.072

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	Crown Castle	Jayaraj B

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(2) DC6-48-60-18-8C	A	From Leg	2' 4.000 0'	0.000	248'	No Ice	2.737	2.737	0.026
DC6-48-60-18-8F	B	From Leg	2' 4.000 0'	0.000	248'	No Ice	1.212	1.212	0.033
DC6-48-60-18-8F	C	From Leg	3' 4.000 0'	0.000	248'	No Ice	1.212	1.212	0.033
(2) L 2.5x2.5x3/16x6'	A	From Leg	3' 4.000 0'	0.000	248'	No Ice	1.500	0.005	0.025
(2) L 2.5x2.5x3/16x6'	B	From Leg	0' 4.000 0'	0.000	248'	No Ice	1.500	0.005	0.025
(2) L 2.5x2.5x3/16x6'	C	From Leg	0' 4.000 0'	0.000	248'	No Ice	1.500	0.005	0.025
Platform Mount [LP 603-1] *	C	None	0'	0.000	248'	No Ice	40.620	40.620	2.060
(2) RWA-80016CF w/ Mount Pipe	A	From Leg	0' 4.000 0'	0.000	235'	No Ice	11.150	8.916	0.064
(2) RWA-80016CF w/ Mount Pipe	B	From Leg	0' 4.000 0'	0.000	235'	No Ice	11.150	8.916	0.064
(2) RWA-80016CF w/ Mount Pipe	C	From Leg	0' 4.000 0'	0.000	235'	No Ice	11.150	8.916	0.064
(2) NHH-65C-R2B	A	From Leg	0' 4.000 0'	0.000	235'	No Ice	5.670	3.400	0.052
(2) NHH-65C-R2B	B	From Leg	0' 4.000 0'	0.000	235'	No Ice	5.670	3.400	0.052
(2) NHH-65C-R2B	C	From Leg	0' 4.000 0'	0.000	235'	No Ice	5.670	3.400	0.052
AIR 6449 B77 w/ Mount Pipe	A	From Leg	0' 4.000 0'	0.000	235'	No Ice	3.650	2.720	0.108
AIR 6449 B77 w/ Mount Pipe	B	From Leg	0' 4.000 0'	0.000	235'	No Ice	3.650	2.720	0.108
AIR 6449 B77 w/ Mount Pipe	C	From Leg	0' 4.000 0'	0.000	235'	No Ice	3.650	2.720	0.108
4449	A	From Leg	0' 4.000 0'	0.000	235'	No Ice	1.969	1.402	0.071
4449	B	From Leg	0' 4.000 0'	0.000	235'	No Ice	1.969	1.402	0.071
4449	C	From Leg	0' 4.000 0'	0.000	235'	No Ice	1.969	1.402	0.071

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
8843	A	From Leg	4.000 0' 0'	0.000	235'	No Ice	1.650	1.363	0.072
8843	B	From Leg	4.000 0' 0'	0.000	235'	No Ice	1.650	1.363	0.072
8843	C	From Leg	4.000 0' 0'	0.000	235'	No Ice	1.650	1.363	0.072
RCMDC-6627-PF-48	A	From Leg	4.000 0' 0'	0.000	235'	No Ice	4.056	3.098	0.032
RCMDC-6627-PF-48	B	From Leg	4.000 0' 0'	0.000	235'	No Ice	4.056	3.098	0.032
(2) 9' x 2" Pipe Mount	A	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.138	2.138	0.065
(2) 9' x 2" Pipe Mount	B	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.138	2.138	0.065
(2) 9' x 2" Pipe Mount	C	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.138	2.138	0.065
12.5'x2.875" Horizontal Pipe Mount	A	From Leg	4.000 0' 0'	0.000	235'	No Ice	3.594	3.594	0.033
12.5'x2.875" Horizontal Pipe Mount	B	From Leg	4.000 0' 0'	0.000	235'	No Ice	3.594	3.594	0.033
12.5'x2.875" Horizontal Pipe Mount	C	From Leg	4.000 0' 0'	0.000	235'	No Ice	3.594	3.594	0.033
(2) L 2 1/2x2 1/2x1/4x8'	A	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.000	0.007	0.062
(2) L 2 1/2x2 1/2x1/4x8'	B	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.000	0.007	0.062
(2) L 2 1/2x2 1/2x1/4x8'	C	From Leg	4.000 0' 0'	0.000	235'	No Ice	2.000	0.007	0.062
Sector Mount [SM 403-3] *	C	None		0.000	235'	No Ice	19.400	19.400	0.873
Pipe Mount [PM 601-1]	B	From Leg	0.500 0' 0'	0.000	220'	No Ice	1.320	1.320	0.065
10.5' x 2.875" horizontal mount pipe *	B	From Leg	0.500 0' 0'	0.000	220'	No Ice	1.258	1.258	0.038
Pipe Mount [PM 601-1]	B	From Leg	0.500 0' 0'	0.000	194'	No Ice	1.320	1.320	0.065
10.5' x 2.875" horizontal mount pipe	B	From Leg	0.500 0' 0'	0.000	194'	No Ice	1.258	1.258	0.038

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
*								
*								
*								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft 0' 0'	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area No Ice	Weight K
UHX6-59/L	B	Paraboloid w/Shroud (HP)	From Leg	1.000 0' 0'	-13.000		220'	6.458	32.760	0.320
*										
UHX6-59/L	B	Paraboloid w/Shroud (HP)	From Leg	1.000 0' 0'	-13.000		194'	6.458	32.760	0.320
*										

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

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Comb. No.	Description
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	Dead+Wind 0 deg - Service
27	Dead+Wind 30 deg - Service
28	Dead+Wind 60 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 120 deg - Service
31	Dead+Wind 150 deg - Service
32	Dead+Wind 180 deg - Service
33	Dead+Wind 210 deg - Service
34	Dead+Wind 240 deg - Service
35	Dead+Wind 270 deg - Service
36	Dead+Wind 300 deg - Service
37	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	245 - 240	Leg	Max Tension	15	4.860	-0.067	0.004
			Max. Compression	18	-8.687	0.038	0.013
			Max. Mx	22	4.306	-0.075	0.011
			Max. My	17	-1.626	-0.017	0.196
			Max. Vy	14	-1.633	0.000	0.000
			Max. Vx	21	-1.848	0.000	0.000
		Diagonal	Max Tension	5	2.089	0.000	0.000
			Max. Compression	16	-2.248	0.000	0.000
			Max. Mx	24	0.927	0.009	-0.001
			Max. My	4	-2.211	0.004	0.002
			Max. Vy	24	0.008	0.009	-0.001
			Max. Vx	4	-0.001	0.000	0.000
		Top Girt	Max Tension	3	1.137	0.000	0.000
			Max. Compression	14	-1.181	0.000	0.000
			Max. Mx	2	-0.608	0.063	0.000
			Max. My	2	1.130	0.000	-0.002
			Max. Vy	2	-0.039	0.000	0.000
			Max. Vx	2	0.001	0.000	0.000
T2	240 - 220	Leg	Max Tension	15	27.632	-0.134	0.027
			Max. Compression	2	-36.484	0.008	0.042
			Max. Mx	2	-29.228	0.213	-0.028
			Max. My	17	-3.044	-0.042	0.315
			Max. Vy	14	-1.480	-0.059	0.007
			Max. Vx	21	-1.341	0.032	0.200
		Diagonal	Max Tension	12	4.271	0.000	0.000
			Max. Compression	12	-4.320	0.000	0.000
			Max. Mx	2	3.782	0.039	0.004
			Max. My	8	2.202	0.023	0.009
			Max. Vy	14	0.023	0.035	-0.001
			Max. Vx	8	-0.002	0.000	0.000
T3	220 - 200	Leg	Max Tension	23	53.335	-0.131	-0.027
			Max. Compression	10	-65.374	0.361	0.017
			Max. Mx	10	-65.374	0.361	0.017
			Max. My	4	-6.894	0.008	-0.430
			Max. Vy	22	-0.507	-0.076	-0.030
			Max. Vx	4	-0.624	-0.033	-0.101
		Diagonal	Max Tension	24	5.227	0.000	0.000
			Max. Compression	24	-5.260	0.000	0.000
			Max. Mx	2	4.599	0.034	0.002
			Max. My	4	-2.899	0.019	-0.005

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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	Leg	Max. Vy	14	0.019	0.034	0.004
			Max. Vx	4	0.001	0.000	0.000
			Max Tension	23	79.459	-0.245	-0.013
			Max. Compression	10	-95.564	0.340	0.019
			Max. Mx	22	59.558	-0.421	-0.004
			Max. My	21	-6.320	-0.017	-0.430
		Diagonal	Max. Vy	22	0.479	-0.421	-0.004
			Max. Vx	4	0.534	0.013	-0.307
			Max Tension	12	6.174	0.000	0.000
			Max. Compression	24	-6.286	0.000	0.000
			Max. Mx	10	5.239	0.082	-0.006
			Max. My	4	-3.407	0.024	-0.012
T5	180 - 160	Leg	Max. Vy	14	0.040	0.078	-0.004
			Max. Vx	4	0.003	0.000	0.000
			Max Tension	23	105.295	-0.262	-0.014
			Max. Compression	10	-125.370	0.648	0.031
			Max. Mx	22	102.496	-0.656	-0.029
			Max. My	4	-12.151	-0.008	-0.691
		Diagonal	Max. Vy	14	0.121	-0.647	0.046
			Max. Vx	21	0.153	-0.007	-0.676
			Max Tension	24	6.713	0.000	0.000
			Max. Compression	24	-6.703	0.000	0.000
			Max. Mx	22	4.987	0.091	-0.008
			Max. My	4	-3.715	0.047	-0.012
T6	160 - 140	Leg	Max. Vy	22	0.045	0.091	-0.008
			Max. Vx	4	0.003	0.000	0.000
			Max Tension	23	127.719	-0.974	-0.029
			Max. Compression	10	-152.021	1.087	0.029
			Max. Mx	10	-152.021	1.087	0.029
			Max. My	25	-13.103	-0.020	1.214
		Diagonal	Max. Vy	14	0.156	-0.977	0.034
			Max. Vx	21	0.195	-0.037	-1.208
			Max Tension	24	7.941	0.000	0.000
			Max. Compression	24	-8.009	0.000	0.000
			Max. Mx	22	5.878	0.147	-0.016
			Max. My	4	-4.039	0.098	-0.019
T7	140 - 120	Leg	Max. Vy	22	0.060	0.147	-0.016
			Max. Vx	4	0.003	0.000	0.000
			Max Tension	23	151.426	-0.945	-0.023
			Max. Compression	10	-180.733	1.265	0.040
			Max. Mx	10	-180.733	1.265	0.040
			Max. My	24	-17.976	-0.059	1.194
		Diagonal	Max. Vy	11	-0.148	1.255	0.041
			Max. Vx	21	0.177	-0.054	-1.169
			Max Tension	24	8.469	0.000	0.000
			Max. Compression	12	-8.580	0.000	0.000
			Max. Mx	22	6.212	0.170	-0.019
			Max. My	4	6.626	0.158	-0.021
T8	120 - 100	Leg	Max. Vy	22	0.066	0.170	-0.019
			Max. Vx	4	0.004	0.000	0.000
			Max Tension	23	174.433	-0.952	-0.020
			Max. Compression	10	-209.554	1.164	0.024
			Max. Mx	10	-194.693	1.265	0.040
			Max. My	24	-22.205	-0.079	1.295
		Diagonal	Max. Vy	11	0.146	1.255	0.041
			Max. Vx	21	-0.205	-0.069	-1.248
			Max Tension	24	9.171	0.000	0.000
			Max. Compression	12	-9.320	0.000	0.000
			Max. Mx	22	6.666	0.229	-0.026
			Max. My	4	7.265	0.214	-0.028
		Max. Vy	22	0.084	0.229	-0.026	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T9	100 - 80	Leg	Max. Vx	4	0.005	0.000	0.000
			Max Tension	23	196.877	-1.138	-0.023
			Max. Compression	10	-238.637	-0.636	-0.020
			Max. Mx	10	-223.757	1.164	0.024
			Max. My	24	-24.670	-0.044	1.571
			Max. Vy	11	0.264	1.081	0.020
		Diagonal	Max. Vx	21	0.226	-0.044	-1.503
			Max Tension	24	9.892	0.000	0.000
			Max. Compression	12	-10.074	0.000	0.000
			Max. Mx	24	9.446	0.253	0.030
			Max. My	4	7.925	0.238	-0.035
			Max. Vy	24	0.091	0.253	0.030
			Max. Vx	4	0.005	0.000	0.000
			Max Tension	23	211.894	1.937	-0.192
T10	80 - 60	Leg	Max. Compression	2	-259.747	-3.040	-0.244
			Max. Mx	10	-259.289	4.902	-0.229
			Max. My	4	-26.055	-0.853	-4.107
			Max. Vy	10	-1.661	4.902	-0.229
			Max. Vx	5	1.251	-0.653	-4.107
		Diagonal	Max Tension	13	11.999	0.000	0.000
			Max. Compression	12	-12.942	0.000	0.000
			Max. Mx	2	0.940	0.091	-0.013
			Max. My	22	-2.826	0.007	-0.013
			Max. Vy	2	-0.037	0.091	-0.013
			Max. Vx	10	-0.003	0.000	0.000
		Horizontal	Max Tension	12	9.584	0.228	-0.006
			Max. Compression	13	-9.431	0.171	-0.005
			Max. Mx	22	-1.096	0.269	0.017
			Max. My	2	1.037	0.182	-0.032
			Max. Vy	22	0.096	0.269	0.017
			Max. Vx	2	-0.005	0.182	-0.032
		Redund Horz 1 Bracing	Max Tension	22	2.956	0.000	0.000
			Max. Compression	11	-2.469	0.000	0.000
			Max. Mx	2	1.406	-0.028	0.000
			Max. My	2	-2.096	0.000	0.001
			Max. Vy	2	-0.019	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	11	1.665	0.000	0.000
			Max. Compression	22	-1.807	0.000	0.000
			Max. Mx	2	-1.001	-0.034	0.000
			Max. My	2	1.635	0.000	0.001
			Max. Vy	2	0.018	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-0.011	0.000	0.000
			Max. Mx	2	-0.009	-0.084	0.000
			Max. Vy	2	0.028	0.000	0.000
T11	60 - 40	Leg	Max Tension	23	233.241	2.086	-0.175
			Max. Compression	2	-289.056	-3.027	-0.282
			Max. Mx	10	-273.426	6.495	-0.245
			Max. My	4	-29.554	-1.057	-5.200
			Max. Vy	10	2.081	6.495	-0.245
			Max. Vx	5	1.374	-0.808	-5.200
		Diagonal	Max Tension	25	12.716	0.048	0.011
			Max. Compression	12	-13.897	0.000	0.000
			Max. Mx	10	0.578	0.097	0.015
			Max. My	22	0.434	0.030	0.015
			Max. Vy	10	-0.044	0.097	0.015
			Max. Vx	10	-0.003	0.000	0.000

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T12	40 - 20	Horizontal	Max Tension	12	10.473	0.265	-0.007
			Max. Compression	13	-10.199	0.199	-0.005
			Max. Mx	22	-0.823	0.301	0.015
			Max. My	2	0.852	0.225	-0.032
			Max. Vy	22	0.103	0.301	0.015
			Max. Vx	2	0.005	0.204	-0.032
		Redund Horz 1 Bracing	Max Tension	22	3.338	0.000	0.000
			Max. Compression	11	-2.708	0.000	0.000
			Max. Mx	2	1.461	-0.033	0.000
			Max. My	2	-2.306	0.000	0.001
			Max. Vy	2	0.020	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	11	1.778	0.000	0.000
			Max. Compression	22	-1.959	0.000	0.000
			Max. Mx	2	-1.392	-0.039	0.000
			Max. My	2	1.562	0.000	-0.001
			Max. Vy	2	0.019	0.000	0.000
			Max. Vx	2	0.001	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-0.012	0.000	0.000
			Max. Mx	2	-0.010	-0.141	0.000
			Max. Vy	2	0.043	0.000	0.000
			Max Tension	23	254.263	2.105	-0.180
			Max. Compression	2	-319.315	-4.002	-0.219
T13	20 - 0	Leg	Max. Mx	2	-303.611	8.193	0.154
			Max. My	24	-37.434	-1.311	5.284
			Max. Vy	10	2.503	8.187	-0.260
			Max. Vx	5	1.340	-0.957	-5.242
		Diagonal	Max Tension	25	13.522	0.055	0.016
			Max. Compression	12	-15.006	0.000	0.000
			Max. Mx	16	-7.399	0.136	0.021
			Max. My	22	-1.206	0.057	-0.021
			Max. Vy	16	0.060	0.136	0.021
			Max. Vx	10	-0.004	0.000	0.000
		Horizontal	Max Tension	12	11.366	0.325	-0.009
			Max. Compression	13	-11.018	0.244	-0.006
			Max. Mx	22	-0.845	0.375	0.028
			Max. My	2	0.937	0.271	-0.049
			Max. Vy	22	0.118	0.375	0.028
			Max. Vx	2	-0.006	0.247	-0.049
		Redund Horz 1 Bracing	Max Tension	24	3.858	0.000	0.000
			Max. Compression	3	-2.964	0.000	0.000
			Max. Mx	2	1.438	-0.055	0.000
			Max. My	2	-2.531	0.000	0.002
			Max. Vy	2	0.032	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	3	1.925	0.000	0.000
			Max. Compression	24	-2.173	0.000	0.000
			Max. Mx	2	-1.454	-0.044	0.000
			Max. My	2	1.709	0.000	-0.002
			Max. Vy	2	0.021	0.000	0.000
			Max. Vx	2	0.001	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-0.016	0.000	0.000
			Max. Mx	2	-0.013	-0.178	0.000
			Max. Vy	2	0.051	0.000	0.000
		Leg	Max Tension	23	275.481	1.733	-0.192

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-350.823	0.000	-0.000
			Max. Mx	2	-334.395	8.015	0.151
			Max. My	24	-39.709	-1.479	5.347
			Max. Vy	2	2.453	8.015	0.151
			Max. Vx	5	-1.595	-1.082	-5.307
		Diagonal	Max Tension	25	14.272	0.053	0.017
			Max. Compression	12	-15.764	0.000	0.000
			Max. Mx	16	-7.074	0.156	0.023
			Max. My	2	1.055	0.144	0.023
			Max. Vy	16	-0.064	0.156	0.023
			Max. Vx	14	-0.004	0.000	0.000
		Horizontal	Max Tension	12	12.261	0.373	-0.010
			Max. Compression	13	-11.999	0.280	-0.008
			Max. Mx	22	-1.458	0.420	0.029
			Max. My	2	1.480	0.322	-0.054
			Max. Vy	22	-0.125	0.420	0.029
			Max. Vx	2	0.006	0.322	-0.054
		Redund Horz 1 Bracing	Max Tension	24	3.859	0.000	0.000
			Max. Compression	3	-2.959	0.000	0.000
			Max. Mx	2	1.100	-0.064	0.000
			Max. My	2	-1.996	0.000	0.002
			Max. Vy	2	0.034	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	3	1.908	0.000	0.000
			Max. Compression	24	-2.138	0.000	0.000
			Max. Mx	2	-1.107	-0.049	0.000
			Max. My	2	1.536	0.000	0.002
			Max. Vy	2	0.022	0.000	0.000
			Max. Vx	2	-0.001	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-0.017	0.000	0.000
			Max. Mx	2	-0.014	-0.218	0.000
			Max. Vy	2	0.058	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	345.790	33.117	-18.953
	Max. H _x	18	345.790	33.117	-18.953
	Max. H _z	5	-241.744	-23.156	15.563
	Min. Vert	7	-262.527	-25.984	14.812
	Min. H _x	7	-262.527	-25.984	14.812
	Min. H _z	18	345.790	33.117	-18.953
Leg B	Max. Vert	10	364.764	-34.616	-20.729
	Max. H _x	23	-286.876	27.934	16.802
	Max. H _z	25	-265.946	24.844	17.935
	Min. Vert	23	-286.876	27.934	16.802
	Min. H _x	10	364.764	-34.616	-20.729
	Min. H _z	10	364.764	-34.616	-20.729
Leg A	Max. Vert	2	366.266	0.424	40.547
	Max. H _x	20	40.231	5.884	3.284
	Max. H _z	2	366.266	0.424	40.547
	Min. Vert	15	-282.597	-0.441	-32.470

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H _x	9	25.159	-5.854	2.059
	Min. H _z	15	-282.597	-0.441	-32.470

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	89.582	-0.000	0.000	-22.481	-7.263	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	107.499	-0.746	-65.313	-8871.056	146.171	20.749
0.9 Dead+1.0 Wind 0 deg - No Ice	80.624	-0.746	-65.313	-8864.312	148.350	20.749
1.2 Dead+1.0 Wind 30 deg - No Ice	107.499	30.410	-51.679	-7120.125	-4222.453	42.227
0.9 Dead+1.0 Wind 30 deg - No Ice	80.624	30.410	-51.679	-7113.381	-4220.274	42.227
1.2 Dead+1.0 Wind 60 deg - No Ice	107.499	48.666	-27.094	-3747.837	-6813.712	6.370
0.9 Dead+1.0 Wind 60 deg - No Ice	80.624	48.666	-27.094	-3741.093	-6811.533	6.370
1.2 Dead+1.0 Wind 90 deg - No Ice	107.499	57.287	0.318	39.307	-7955.788	-38.322
0.9 Dead+1.0 Wind 90 deg - No Ice	80.624	57.287	0.318	46.051	-7953.609	-38.322
1.2 Dead+1.0 Wind 120 deg - No Ice	107.499	56.344	32.290	4354.306	-7682.905	-34.201
0.9 Dead+1.0 Wind 120 deg - No Ice	80.624	56.344	32.290	4361.050	-7680.726	-34.201
1.2 Dead+1.0 Wind 150 deg - No Ice	107.499	32.992	55.457	7564.541	-4593.435	-14.357
0.9 Dead+1.0 Wind 150 deg - No Ice	80.624	32.992	55.457	7571.285	-4591.256	-14.357
1.2 Dead+1.0 Wind 180 deg - No Ice	107.499	0.588	60.225	8301.584	-130.809	-22.507
0.9 Dead+1.0 Wind 180 deg - No Ice	80.624	0.588	60.225	8308.328	-128.630	-22.507
1.2 Dead+1.0 Wind 210 deg - No Ice	107.499	-30.376	51.629	7055.718	4197.887	-41.086
0.9 Dead+1.0 Wind 210 deg - No Ice	80.624	-30.376	51.629	7062.463	4200.066	-41.086
1.2 Dead+1.0 Wind 240 deg - No Ice	107.499	-53.531	29.548	3933.181	7337.834	-5.609
0.9 Dead+1.0 Wind 240 deg - No Ice	80.624	-53.531	29.548	3939.925	7340.013	-5.609
1.2 Dead+1.0 Wind 270 deg - No Ice	107.499	-57.805	-0.438	-118.068	8045.792	38.216
0.9 Dead+1.0 Wind 270 deg - No Ice	80.624	-57.805	-0.438	-111.323	8047.971	38.216
1.2 Dead+1.0 Wind 300 deg - No Ice	107.499	-52.397	-29.894	-4181.003	7314.071	32.712
0.9 Dead+1.0 Wind 300 deg - No Ice	80.624	-52.397	-29.894	-4174.259	7316.250	32.712
1.2 Dead+1.0 Wind 330 deg - No Ice	107.499	-33.388	-55.645	-7657.536	4658.084	12.537
0.9 Dead+1.0 Wind 330 deg - No Ice	80.624	-33.388	-55.645	-7650.792	4660.263	12.537

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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+Wind 0 deg - Service	89.582	-0.203	-18.372	-2490.178	34.890	5.647
Dead+Wind 30 deg - Service	89.582	8.575	-14.581	-2005.517	-1184.422	11.497
Dead+Wind 60 deg - Service	89.582	13.761	-7.672	-1065.501	-1911.878	1.742
Dead+Wind 90 deg - Service	89.582	16.188	0.087	-4.441	-2230.837	-10.420
Dead+Wind 120 deg - Service	89.582	15.851	9.086	1200.276	-2148.432	-9.300
Dead+Wind 150 deg - Service	89.582	9.277	15.610	2096.188	-1285.386	-3.903
Dead+Wind 180 deg - Service	89.582	0.160	16.987	2304.916	-40.491	-6.125
Dead+Wind 210 deg - Service	89.582	-8.565	14.568	1957.710	1167.953	-11.186
Dead+Wind 240 deg - Service	89.582	-15.085	8.340	1085.665	2044.737	-1.534
Dead+Wind 270 deg - Service	89.582	-16.329	-0.119	-47.271	2245.549	10.392
Dead+Wind 300 deg - Service	89.582	-14.777	-8.434	-1183.388	2038.270	8.895
Dead+Wind 330 deg - Service	89.582	-9.385	-15.661	-2151.775	1293.198	3.407

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	-89.582	0.000	0.000	89.582	-0.000	0.000%
2	-0.746	-107.499	-65.313	0.746	107.499	65.313	0.000%
3	-0.746	-80.624	-65.313	0.746	80.624	65.313	0.000%
4	30.410	-107.499	-51.679	-30.410	107.499	51.679	0.000%
5	30.410	-80.624	-51.679	-30.410	80.624	51.679	0.000%
6	48.666	-107.499	-27.094	-48.666	107.499	27.094	0.000%
7	48.666	-80.624	-27.094	-48.666	80.624	27.094	0.000%
8	57.287	-107.499	0.318	-57.287	107.499	-0.318	0.000%
9	57.287	-80.624	0.318	-57.287	80.624	-0.318	0.000%
10	56.344	-107.499	32.290	-56.344	107.499	-32.290	0.000%
11	56.344	-80.624	32.290	-56.344	80.624	-32.290	0.000%
12	32.992	-107.499	55.457	-32.992	107.499	-55.457	0.000%
13	32.992	-80.624	55.457	-32.992	80.624	-55.457	0.000%
14	0.588	-107.499	60.225	-0.588	107.499	-60.225	0.000%
15	0.588	-80.624	60.225	-0.588	80.624	-60.225	0.000%
16	-30.376	-107.499	51.629	30.376	107.499	-51.629	0.000%
17	-30.376	-80.624	51.629	30.376	80.624	-51.629	0.000%
18	-53.531	-107.499	29.548	53.531	107.499	-29.548	0.000%
19	-53.531	-80.624	29.548	53.531	80.624	-29.548	0.000%
20	-57.805	-107.499	-0.438	57.805	107.499	0.438	0.000%
21	-57.805	-80.624	-0.438	57.805	80.624	0.438	0.000%
22	-52.397	-107.499	-29.894	52.397	107.499	29.894	0.000%
23	-52.397	-80.624	-29.894	52.397	80.624	29.894	0.000%
24	-33.388	-107.499	-55.645	33.388	107.499	55.645	0.000%
25	-33.388	-80.624	-55.645	33.388	80.624	55.645	0.000%
26	-0.203	-89.582	-18.372	0.203	89.582	18.372	0.000%
27	8.575	-89.582	-14.581	-8.575	89.582	14.581	0.000%
28	13.761	-89.582	-7.672	-13.761	89.582	7.672	0.000%
29	16.188	-89.582	0.087	-16.188	89.582	-0.087	0.000%
30	15.851	-89.582	9.086	-15.851	89.582	-9.086	0.000%
31	9.277	-89.582	15.610	-9.277	89.582	-15.610	0.000%
32	0.160	-89.582	16.987	-0.160	89.582	-16.987	0.000%
33	-8.565	-89.582	14.568	8.565	89.582	-14.568	0.000%
34	-15.085	-89.582	8.340	15.085	89.582	-8.340	0.000%
35	-16.329	-89.582	-0.119	16.329	89.582	0.119	0.000%
36	-14.777	-89.582	-8.434	14.777	89.582	8.434	0.000%
37	-9.385	-89.582	-15.661	9.385	89.582	15.661	0.000%

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Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	245 - 240	3.806	37	0.143	0.021
T2	240 - 220	3.653	37	0.142	0.022
T3	220 - 200	3.067	37	0.131	0.021
T4	200 - 180	2.521	37	0.118	0.018
T5	180 - 160	2.040	37	0.104	0.015
T6	160 - 140	1.617	37	0.090	0.013
T7	140 - 120	1.251	37	0.078	0.011
T8	120 - 100	0.935	37	0.065	0.009
T9	100 - 80	0.670	37	0.053	0.008
T10	80 - 60	0.449	37	0.043	0.007
T11	60 - 40	0.268	37	0.031	0.005
T12	40 - 20	0.136	26	0.020	0.003
T13	20 - 0	0.049	26	0.010	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250'	Lightning Rod 5/8" x 3' on 5' Pole	37	3.806	0.143	0.021	119926
248'	(2) DB878G105AXY w/ Mount Pipe	37	3.806	0.143	0.021	119926
247'6"	Sabre Top Hat	37	3.806	0.143	0.021	119926
235'	(2) RWA-80016CF w/ Mount Pipe	37	3.503	0.139	0.022	109598
220'	UHX6-59/L	37	3.067	0.131	0.021	141608
194'	UHX6-59/L	37	2.370	0.114	0.017	67917
126'6"	Side Lighting	37	1.032	0.069	0.010	91645

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	245 - 240	13.744	24	0.521	0.078
T2	240 - 220	13.189	24	0.515	0.079
T3	220 - 200	11.059	24	0.477	0.078
T4	200 - 180	9.077	24	0.430	0.065
T5	180 - 160	7.335	24	0.376	0.056
T6	160 - 140	5.804	24	0.324	0.046
T7	140 - 120	4.483	24	0.280	0.040
T8	120 - 100	3.346	24	0.233	0.034
T9	100 - 80	2.396	24	0.191	0.029
T10	80 - 60	1.603	24	0.155	0.024
T11	60 - 40	0.956	24	0.112	0.017
T12	40 - 20	0.483	2	0.071	0.010
T13	20 - 0	0.175	3	0.036	0.005

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Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
250'	Lightning Rod 5/8" x 3' on 5' Pole	24	13.744	0.521	0.078	32921
248'	(2) DB878G105AXY w/ Mount Pipe	24	13.744	0.521	0.078	32921
247'6"	Sabre Top Hat	24	13.744	0.521	0.078	32921
235'	(2) RWA-80016CF w/ Mount Pipe	24	12.642	0.507	0.080	29986
220'	UHX6-59/L	24	11.059	0.477	0.078	39007
194'	UHX6-59/L	24	8.529	0.414	0.062	18666
126'6"	Side Lighting	24	3.695	0.248	0.036	25172

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	245	Leg	A325N	1.000	4	1.215	54.517	0.022 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.625	1	2.089	10.500	0.199 ✓	1.05	Member Block Shear
		Top Girt	A325X	0.625	3	0.379	12.667	0.030 ✓	1.05	Member Bearing
T2	240	Leg	A325N	1.000	4	6.908	54.517	0.127 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.625	1	4.320	17.257	0.250 ✓	1.05	Bolt Shear
T3	220	Leg	A325N	1.250	4	13.334	87.220	0.153 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.625	1	5.227	13.219	0.395 ✓	1.05	Member Block Shear
T4	200	Leg	A325N	1.250	4	19.865	87.220	0.228 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	6.174	20.848	0.296 ✓	1.05	Member Block Shear
T5	180	Leg	A325N	1.250	6	17.549	87.220	0.201 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	6.713	20.848	0.322 ✓	1.05	Member Block Shear
T6	160	Leg	A325N	1.250	6	21.287	87.220	0.244 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	7.941	21.532	0.369 ✓	1.05	Member Bearing
T7	140	Leg	A325N	1.375	6	25.238	103.939	0.243 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	8.469	21.532	0.393 ✓	1.05	Member Bearing
T8	120	Leg	A325N	1.375	6	29.072	103.939	0.280 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	9.171	21.532	0.426 ✓	1.05	Member Bearing
T9	100	Leg	A325N	1.375	6	32.813	103.939	0.316 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	9.892	21.532	0.459 ✓	1.05	Member Bearing
T10	80	Leg	A325N	1.375	6	35.252	103.939	0.339 ✓	1.05	Bolt Tension
		Diagonal	A325X	0.625	2	6.000	12.445	0.482 ✓	1.05	Member Block Shear
		Horizontal	A325X	0.625	2	4.792	17.257	0.278 ✓	1.05	Bolt Shear
		Redund Horiz 1 Bracing	A325N	0.625	1	4.505	13.806	0.326 ✓	1.05	Bolt Shear

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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
T11	60	Redund Diag 1 Bracing Leg	A325N	0.625	1	2.912	13.806	0.211 ✓	1.05	Bolt Shear
		Diagonal	A449	1.750	6	38.802	170.951	0.227 ✓	1.05	Bolt Tension
		Horizontal	A325X	0.625	2	6.358	15.557	0.409 ✓	1.05	Member Block Shear
		Horizontal	A325X	0.625	2	5.237	17.257	0.303 ✓	1.05	Bolt Shear
T12	40	Redund Horiz 1 Bracing	A325N	0.625	1	5.013	13.806	0.363 ✓	1.05	Bolt Shear
		Redund Diag 1 Bracing Leg	A325N	0.625	1	3.133	13.806	0.227 ✓	1.05	Bolt Shear
		Diagonal	A449	1.750	6	42.288	170.951	0.247 ✓	1.05	Bolt Tension
		Horizontal	A325X	0.750	2	6.761	19.297	0.350 ✓	1.05	Member Block Shear
T13	20	Horizontal	A325X	0.750	2	5.683	19.480	0.292 ✓	1.05	Member Block Shear
		Redund Horiz 1 Bracing	A325N	0.750	1	5.538	19.880	0.279 ✓	1.05	Bolt Shear
		Redund Diag 1 Bracing	A325N	0.750	1	3.364	13.898	0.242 ✓	1.05	Member Block Shear
		Diagonal	A325X	0.750	2	7.136	19.297	0.370 ✓	1.05	Member Block Shear
		Horizontal	A325X	0.750	2	6.130	19.480	0.315 ✓	1.05	Member Block Shear
		Redund Horiz 1 Bracing	A325N	0.750	1	6.084	19.880	0.306 ✓	1.05	Bolt Shear
		Redund Diag 1 Bracing	A325N	0.750	1	3.610	13.898	0.260 ✓	1.05	Member Block Shear

Compression Checks

Leg 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	245 - 240	Sabre 3.5"x0.216"	5'5/32"	5'5/32"	51.7 K=1.00	2.228	-8.687	82.486	0.105 ¹ ✓
T2	240 - 220	Sabre 4.5" x 0.337"	20'13/32"	5'3/32"	40.7 K=1.00	4.407	-36.484	175.711	0.208 ¹ ✓
T3	220 - 200	Sabre 4.5"x0.5310"	20'13/32"	6'8-1/8"	56.6 K=1.00	6.621	-65.374	235.726	0.277 ¹ ✓
T4	200 - 180	Sabre 5.5625" x 0.5"	20'13/32"	6'8-1/8"	44.6 K=1.00	7.952	-95.564	309.502	0.309 ¹ ✓
T5	180 - 160	Sabre 5.5625" x 0.625"	20'13/32"	6'8-1/8"	45.5 K=1.00	9.695	-125.370	374.880	0.334 ¹ ✓
T6	160 - 140	Sabre 8.625"x0.5"	20'13/32"	10'7/32"	41.8 K=1.00	12.763	-152.021	505.555	0.301 ¹ ✓
T7	140 - 120	Sabre 8.625"x0.5"	20'13/32"	10'7/32"	41.8 K=1.00	12.763	-180.733	505.555	0.357 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	120 - 100	Sabre 8.625" x 0.593"	20'13/32"	10'7/32"	42.2 K=1.00	14.963	-209.554	591.094	0.355 ¹ ✓
T9	100 - 80	Sabre 8.625" x 0.718"	20'13/32"	10'7/32"	42.8 K=1.00	17.836	-238.637	701.897	0.340 ¹ ✓
T10	80 - 60	Sabre 8.625" x 0.593"	20'13/32"	5'3/32"	21.1 K=1.00	14.963	-259.747	651.771	0.399 ¹ ✓
T11	60 - 40	Sabre 10.75"x0.5"	20'13/32"	5'3/32"	16.6 K=1.00	16.101	-289.056	710.139	0.407 ¹ ✓
T12	40 - 20	Sabre 12.75"x0.5"	20'13/32"	5'3/32"	13.9 K=1.00	19.242	-319.315	853.816	0.374 ¹ ✓
T13	20 - 0	Sabre 12.75"x0.5"	20'13/32"	5'3/32"	13.9 K=1.00	19.242	-350.823	853.816	0.411 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	245 - 240	L1 3/4x1 3/4x1/4	8'4-11/32"	4'15/32"	142.0 K=1.00	0.813	-2.248	11.528	0.195 ¹ ✓
T2	240 - 220	L2 1/2x2 1/2x3/8	10'15/16"	4'9-7/8"	119.1 K=1.00	1.730	-4.320	34.498	0.125 ¹ ✓
T3	220 - 200	L2 1/2x2 1/2x1/4	12'6-31/32"	6'1-7/16"	149.6 K=1.00	1.190	-5.260	15.226	0.345 ¹ ✓
T4	200 - 180	L3x3x3/8	14'3-25/32"	6'11-1/4"	141.8 K=1.00	2.110	-6.286	30.019	0.209 ¹ ✓
T5	180 - 160	L3x3x3/8	16'1-11/32"	7'10-1/16"	160.2 K=1.00	2.110	-6.703	23.519	0.285 ¹ ✓
T6	160 - 140	L3 1/2x3 1/2x3/8	19'3-9/16"	9'4-1/2"	163.7 K=1.00	2.480	-8.009	26.474	0.303 ¹ ✓
T7	140 - 120	L3 1/2x3 1/2x3/8	21'3/8"	10'2-15/16"	179.0 K=1.00	2.480	-8.580	22.162	0.387 ¹ ✓
T8	120 - 100	L4x4x3/8	22'9-23/32"	11'1-21/32"	169.6 K=1.00	2.860	-9.320	28.454	0.328 ¹ ✓
T9	100 - 80	L4x4x3/8	24'7-1/2"	12'9/16"	183.4 K=1.00	2.860	-10.074	24.324	0.414 ¹ ✓
T10	80 - 60	L4x4x1/4	16'1/8"	15'6-19/32"	149.3 K=1.00	1.940	-12.942	24.916	0.519 ¹ ✓
T11	60 - 40	L3 1/2x4x5/16	16'9-5/8"	16'2-15/16"	154.7 K=1.00	2.250	-13.897	26.903	0.517 ¹ ✓
T12	40 - 20	L4x4x3/8	17'7-13/32"	16'11-21/32"	165.6 K=1.00	2.860	-15.007	29.860	0.503 ¹ ✓
T13	20 - 0	L4x4x3/8	18'5-3/8"	17'9-25/32"	173.8 K=1.00	2.860	-15.764	27.095	0.582 ¹ ✓

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¹ $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	
T10	80 - 60	L4x4x3/8	24'	11'7-11/16"	177.3 K=1.00	2.860	-9.431	26.050	0.362 ¹ ✓
T11	60 - 40	L4x4x3/8	26'	12'6-5/8"	191.1 K=1.00	2.860	-10.199	22.404	0.455 ¹ ✓
T12	40 - 20	L5x5x5/16	28'	13'5-5/8"	162.6 K=1.00	3.030	-11.018	32.802	0.336 ¹ ✓
T13	20 - 0	L5x5x5/16	30'	14'5-5/8"	174.7 K=1.00	3.030	-11.999	28.424	0.422 ¹ ✓

¹ $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	
T1	245 - 240	C7x9.8	6'4-13/16"	6'1-5/16"	126.2 K=1.00	2.870	-1.181	40.216	0.029 ¹ ✓

¹ $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	
T10	80 - 60	L3x3x1/4	6'	5'7-11/16"	114.3 K=1.00	1.440	-4.505	30.530	0.148 ¹ ✓
T11	60 - 40	L3x3x1/4	6'6"	6'5/8"	122.7 K=1.00	1.440	-5.013	27.308	0.184 ¹ ✓
T12	40 - 20	L3x3x3/8	7'	6'5-5/8"	132.2 K=1.00	2.110	-5.538	34.535	0.160 ¹ ✓
T13	20 - 0	L3x3x3/8	7'6"	6'11-5/8"	142.5 K=1.00	2.110	-6.084	29.757	0.204 ¹ ✓

¹ $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Compression)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T10	80 - 60	L3x3x1/4	7'7-7/16'	7'1-3/4"	144.8 K=1.00	1.440	-2.861	19.648	0.146 ¹ ✓
T11	60 - 40	L3x3x1/4	8'1/16"	7'5-3/16'	150.6 K=1.00	1.440	-3.087	18.162	0.170 ¹ ✓
T12	40 - 20	L3x3x1/4	8'4-13/16"	7'8-7/8"	156.9 K=1.00	1.440	-3.323	16.743	0.198 ¹ ✓
T13	20 - 0	L3x3x1/4	8'9-11/16"	8'1-31/32"	165.5 K=1.00	1.440	-3.573	15.054	0.237 ¹ ✓

¹ P_u / φP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T10	80 - 60	L3x3x3/16	12'	12'	241.6 K=1.00	1.090	-0.011	5.344	0.002 ¹ ✓
T11	60 - 40	L3x3 1/2x1/4	13'	13'	247.2 K=1.00	1.560	-0.012	7.305	0.002 ¹ ✓
T12	40 - 20	L3 1/2x3 1/2x1/4	14'	14'	242.1 K=1.00	1.690	-0.016	8.254	0.002 ¹ ✓
T13	20 - 0	L3 1/2x4x1/4	15'	15'	245.2 K=1.00	1.810	-0.017	8.614	0.002 ¹ ✓

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	245 - 240	Sabre 3.5"x0.216"	5'5/32"	5'5/32"	51.7	2.228	4.860	100.281	0.048 ¹ ✓
T2	240 - 220	Sabre 4.5" x 0.337"	20'13/32"	5'3/32"	40.7	4.407	27.632	198.335	0.139 ¹ ✓
T3	220 - 200	Sabre 4.5"x0.5310"	20'13/32"	6'8-1/8"	56.6	6.621	53.335	297.946	0.179 ¹ ✓
T4	200 - 180	Sabre 5.5625" x 0.5"	20'13/32"	6'8-1/8"	44.6	7.952	79.459	357.847	0.222 ¹ ✓
T5	180 - 160	Sabre 5.5625" x 0.625"	20'13/32"	6'8-1/8"	45.5	9.695	105.295	436.264	0.241 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	160 - 140	Sabre 8.625"x0.5"	20'13/32"	10'7/32"	41.8	12.763	127.719	574.322	0.222 ¹
T7	140 - 120	Sabre 8.625"x0.5"	20'13/32"	10'7/32"	41.8	12.763	151.426	574.322	0.264 ¹
T8	120 - 100	Sabre 8.625" x 0.593"	20'13/32"	10'7/32"	42.2	14.963	174.433	673.350	0.259 ¹
T9	100 - 80	Sabre 8.625" x 0.718"	20'13/32"	10'7/32"	42.8	17.836	196.877	802.599	0.245 ¹
T10	80 - 60	Sabre 8.625" x 0.593"	20'13/32"	5'3/32"	21.1	14.963	211.894	673.350	0.315 ¹
T11	60 - 40	Sabre 10.75"x0.5"	20'13/32"	5'3/32"	16.6	16.101	233.241	724.530	0.322 ¹
T12	40 - 20	Sabre 12.75"x0.5"	20'13/32"	5'3/32"	13.9	19.242	254.263	865.902	0.294 ¹
T13	20 - 0	Sabre 12.75"x0.5"	20'13/32"	5'3/32"	13.9	19.242	275.481	865.902	0.318 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	245 - 240	L1 3/4x1 3/4x1/4	8'4-11/32"	4'15/32"	95.0	0.469	2.089	20.391	0.102 ¹
T2	240 - 220	L2 1/2x2 1/2x3/8	9'7-25/32"	4'7-9/32"	75.8	1.087	4.271	47.266	0.090 ¹
T3	220 - 200	L2 1/2x2 1/2x1/4	12'6-31/32"	6'1-7/16"	97.8	0.752	5.227	32.707	0.160 ¹
T4	200 - 180	L3x3x3/8	14'3-25/32"	6'11-1/4"	93.1	1.336	6.174	58.134	0.106 ¹
T5	180 - 160	L3x3x3/8	16'1-11/32"	7'10-1/16"	104.9	1.336	6.713	58.134	0.115 ¹
T6	160 - 140	L3 1/2x3 1/2x3/8	19'3-9/16"	9'4-1/2"	106.8	1.614	7.941	70.205	0.113 ¹
T7	140 - 120	L3 1/2x3 1/2x3/8	21'3/8"	10'2-15/16"	116.5	1.614	8.469	70.205	0.121 ¹
T8	120 - 100	L4x4x3/8	22'9-23/32"	11'1-21/32"	110.1	1.899	9.171	82.602	0.111 ¹
T9	100 - 80	L4x4x3/8	24'7-1/2"	12'9/16"	118.9	1.899	9.892	82.602	0.120 ¹
T10	80 - 60	L4x4x1/4	16'1/8"	15'6-19/32"	149.3	1.314	11.999	57.175	0.210 ¹
T11	60 - 40	L3 1/2x4x5/16	16'9-5/8"	16'2-15/16"	154.7	1.512	12.716	65.760	0.193 ¹
T12	40 - 20	L4x4x3/8	17'7-13/32"	16'11-21/32"	165.6	1.899	13.522	82.602	0.164 ¹
T13	20 - 0	L4x4x3/8	18'5-3/8"	17'9-25/32"	173.8	1.899	14.272	82.602	0.173 ¹

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

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 $\frac{P_u}{\phi P_n}$
T10	80 - 60	L4x4x3/8	24'	11'7-11/16"	113.6	1.934	9.584	84.132	0.114 ¹ ✓
T11	60 - 40	L4x4x3/8	26'	12'6-5/8'	122.5	1.934	10.473	84.132	0.124 ¹ ✓
T12	40 - 20	L5x5x5/16	28'	13'5-5/8'	102.9	2.067	11.366	89.933	0.126 ¹ ✓
T13	20 - 0	L5x5x5/16	30'	14'5-5/8'	110.6	2.067	12.261	89.933	0.136 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	245 - 240	C7x9.8	6'4-13/16"	6'1-5/16'	126.2	2.034	1.137	88.495	0.013 ¹ ✓

¹ P_u / φP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T10	80 - 60	L3x3x1/4	6'	5'7-11/16"	72.8	0.939	4.505	40.863	0.110 ¹ ✓
T11	60 - 40	L3x3x1/4	6'6"	6'5/8"	78.1	0.939	5.013	40.863	0.123 ¹ ✓
T12	40 - 20	L3x3x3/8	7'	6'5-5/8"	85.0	1.336	5.538	58.134	0.095 ¹ ✓
T13	20 - 0	L3x3x3/8	7'6"	6'11-5/8'	91.6	1.336	6.084	58.134	0.105 ¹ ✓

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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

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T10	80 - 60	L3x3x1/4	7'5"-7/32'	6'11"-1/2'	89.8	0.939	2.912	40.863	0.071 ¹
T11	60 - 40	L3x3x1/4	7'9"-3/4"	7'2"-27/32"	93.4	0.939	3.133	40.863	0.077 ¹
T12	40 - 20	L3x3x1/4	8'2"-7/16'	7'6"-1/2"	97.3	0.916	3.364	39.843	0.084 ¹
T13	20 - 0	L3x3x1/4	8'7"-1/4"	7'11"-1/2'	102.7	0.916	3.610	39.843	0.091 ¹

¹ P_u / φP_n controls

Section Capacity Table

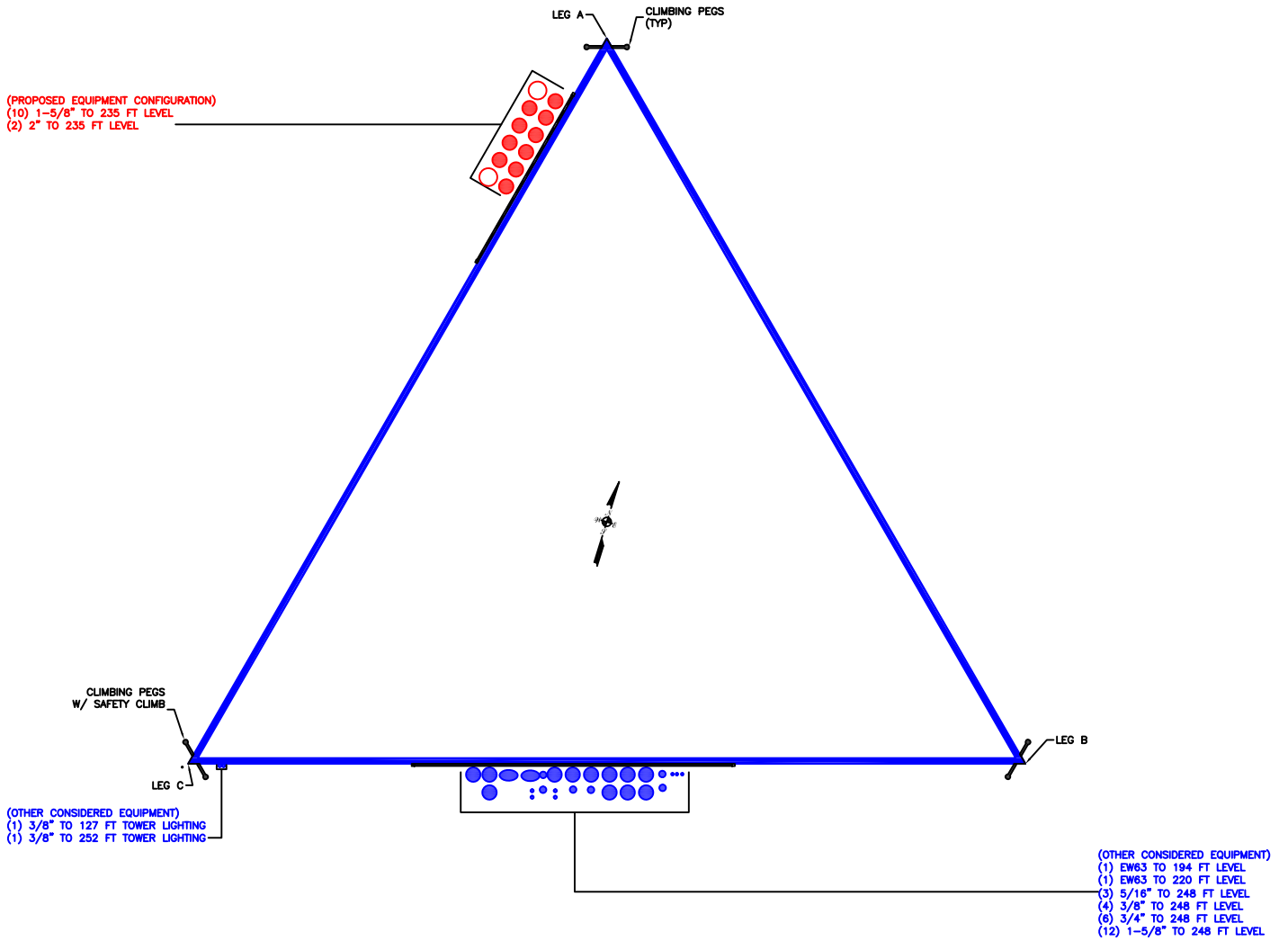
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	245 - 240	Leg	Sabre 3.5"x0.216"	1	-8.687	86.611	10.0	Pass
T2	240 - 220	Leg	Sabre 4.5" x 0.337"	15	-36.484	184.497	19.8	Pass
T3	220 - 200	Leg	Sabre 4.5"x0.5310"	41	-65.374	247.512	26.4	Pass
T4	200 - 180	Leg	Sabre 5.5625" x 0.5"	62	-95.564	324.977	29.4	Pass
T5	180 - 160	Leg	Sabre 5.5625" x 0.625"	83	-125.370	393.624	31.9	Pass
T6	160 - 140	Leg	Sabre 8.625"x0.5"	104	-152.021	530.833	28.6	Pass
T7	140 - 120	Leg	Sabre 8.625"x0.5"	119	-180.733	530.833	34.0	Pass
T8	120 - 100	Leg	Sabre 8.625" x 0.593"	134	-209.554	620.649	33.8	Pass
T9	100 - 80	Leg	Sabre 8.625" x 0.718"	149	-238.637	736.992	32.4	Pass
T10	80 - 60	Leg	Sabre 8.625" x 0.593"	165	-259.747	684.360	38.0	Pass
T11	60 - 40	Leg	Sabre 10.75"x0.5"	216	-289.056	745.646	38.8	Pass
T12	40 - 20	Leg	Sabre 12.75"x0.5"	267	-319.315	896.507	35.6	Pass
T13	20 - 0	Leg	Sabre 12.75"x0.5"	318	-350.823	896.507	39.1	Pass
T1	245 - 240	Diagonal	L1 3/4x1 3/4x1/4	12	-2.248	12.105	18.6	Pass
T2	240 - 220	Diagonal	L2 1/2x2 1/2x3/8	18	-4.320	36.223	11.9	Pass
T3	220 - 200	Diagonal	L2 1/2x2 1/2x1/4	46	-5.260	15.987	32.9	Pass
T4	200 - 180	Diagonal	L3x3x3/8	67	-6.286	31.520	19.9	Pass
T5	180 - 160	Diagonal	L3x3x3/8	88	-6.703	24.695	27.1	Pass
T6	160 - 140	Diagonal	L3 1/2x3 1/2x3/8	109	-8.009	27.798	28.8	Pass
T7	140 - 120	Diagonal	L3 1/2x3 1/2x3/8	123	-8.580	23.270	36.9	Pass
T8	120 - 100	Diagonal	L4x4x3/8	138	-9.320	29.877	31.2	Pass
T9	100 - 80	Diagonal	L4x4x3/8	153	-10.074	25.540	39.4	Pass
T10	80 - 60	Diagonal	L4x4x1/4	174	-12.942	26.162	49.5	Pass
T11	60 - 40	Diagonal	L3 1/2x4x5/16	225	-13.897	28.248	49.2	Pass
T12	40 - 20	Diagonal	L4x4x3/8	276	-15.007	31.354	47.9	Pass
T13	20 - 0	Diagonal	L4x4x3/8	327	-15.764	28.450	55.4	Pass
T10	80 - 60	Horizontal	L4x4x3/8	173	-9.431	27.352	34.5	Pass

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	Project		Date	17:18:33 12/03/21
	Client	Crown Castle	Designed by	Jayaraj B

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T11	60 - 40	Horizontal	L4x4x3/8	224	-10.199	23.524	43.4	Pass
T12	40 - 20	Horizontal	L5x5x5/16	275	-11.018	34.442	32.0	Pass
T13	20 - 0	Horizontal	L5x5x5/16	326	-11.999	29.845	40.2	Pass
T1	245 - 240	Top Girt	C7x9.8	4	-1.181	42.226	2.8	Pass
T10	80 - 60	Redund Horz 1 Bracing	L3x3x1/4	178	-4.505	32.056	14.1	Pass
T11	60 - 40	Redund Horz 1 Bracing	L3x3x1/4	229	-5.013	28.673	17.5	Pass
T12	40 - 20	Redund Horz 1 Bracing	L3x3x3/8	280	-5.538	36.261	15.3	Pass
T13	20 - 0	Redund Horz 1 Bracing	L3x3x3/8	331	-6.084	31.245	19.5	Pass
T10	80 - 60	Redund Diag 1 Bracing	L3x3x1/4	179	-2.861	20.631	13.9	Pass
T11	60 - 40	Redund Diag 1 Bracing	L3x3x1/4	230	-3.087	19.070	16.2	Pass
T12	40 - 20	Redund Diag 1 Bracing	L3x3x1/4	285	-3.323	17.580	18.9	Pass
T13	20 - 0	Redund Diag 1 Bracing	L3x3x1/4	336	-3.573	15.807	22.6	Pass
T10	80 - 60	Inner Bracing	L3x3x3/16	189	-0.011	5.612	0.2	Pass
T11	60 - 40	Inner Bracing	L3x3 1/2x1/4	240	-0.012	7.670	0.3	Pass
T12	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	291	-0.016	8.667	0.3	Pass
T13	20 - 0	Inner Bracing	L3 1/2x4x1/4	342	-0.016	9.045	0.3	Pass
							Summary	
							Leg (T13)	39.1 Pass
							Diagonal (T13)	55.4 Pass
							Horizontal (T11)	43.4 Pass
							Top Girt (T1)	2.8 Pass
							Redund Horz 1 Bracing (T13)	19.5 Pass
							Redund Diag 1 Bracing (T13)	22.6 Pass
							Inner Bracing (T13)	0.3 Pass
							Bolt Checks	45.9 Pass
							RATING =	55.4 Pass

APPENDIX B
BASE LEVEL DRAWING

(PROPOSED EQUIPMENT CONFIGURATION)
(10) 1-5/8" TO 235 FT LEVEL
(2) 2" TO 235 FT LEVEL



BUSINESS UNIT: 846215

APPENDIX C
ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info	
BU #	846215
Site Name	OSCEOLA, FL
Order #	585989,Rev# 0

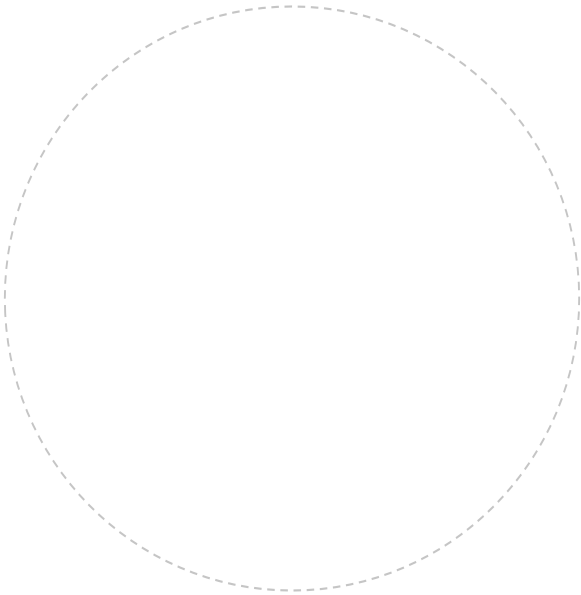
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	366.00	287.00
Shear Force (kips)	41.00	33.00

*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>	
(12) 1-3/4" $\varnothing$ bolts (A572-50 N; Fy=50 ksi, Fu=65 ksi)		Pu_t = 23.92	ϕPn_t = 92.63
l_{ar} (in): 0		Vu = 2.75	ϕVn = 58.63
		Mu = n/a	ϕMn = n/a
			Stress Rating
			24.6%
			Pass

Drilled Pier Foundation

BU # :	846215
Site Name:	OSCEOLA, FL
Order Number:	585989,Rev# 0
TIA-222 Revision:	H
Tower Type:	Self Support

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)		
Axial Force (kips)	366	287
Shear Force (kips)	41	33

Material Properties			Rebar 2, Fy Override (ksi)
Concrete Strength, f'c:	3	ksi	
Rebar Strength, Fy:	60	ksi	
Tie Yield Strength, Fyt:	60	ksi	

Pier Design Data		
Depth	55	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 55' below grade		
Pier Diameter	5.5	ft
Rebar Quantity	28	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	4	
Tie Spacing	12	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Analysis Results		
Soil Lateral Check	Compression	Uplift
D _{v=0} (ft from TOC)	31.14	31.14
Soil Safety Factor	41.72	51.83
Max Moment (kip-ft)	817.55	658.03
Rating*	3.0%	2.4%
Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	1093.75	875.00
End Bearing (kips)	1336.40	-
Weight of Concrete (kips)	145.72	109.29
Total Capacity (kips)	2430.15	984.29
Axial (kips)	511.72	287.00
Rating*	20.1%	27.8%
Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	31.27	30.16
Critical Moment (kip-ft)	817.52	657.10
Critical Moment Capacity	3867.74	3003.10
Rating*	20.1%	20.8%
Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	47.76	47.76
Critical Shear (kip)	76.83	61.84
Critical Shear Capacity	540.74	312.51
Rating*	13.5%	18.8%

Structural Foundation Rating*	20.8%
Soil Interaction Rating*	27.8%

*Rating per TIA-222-H Section 15.5



Check Limitation	
Apply TIA-222-H Section 15.5:	☒
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☒
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

[Go to Soil Calculations](#)

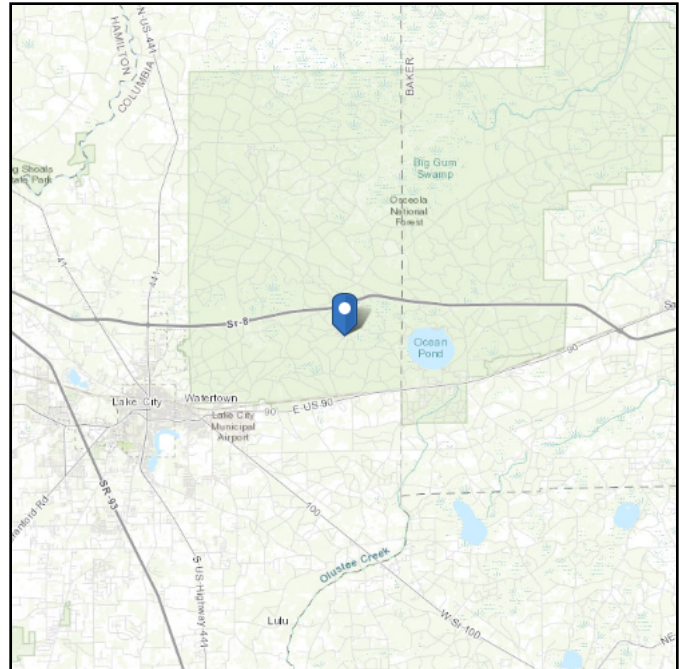
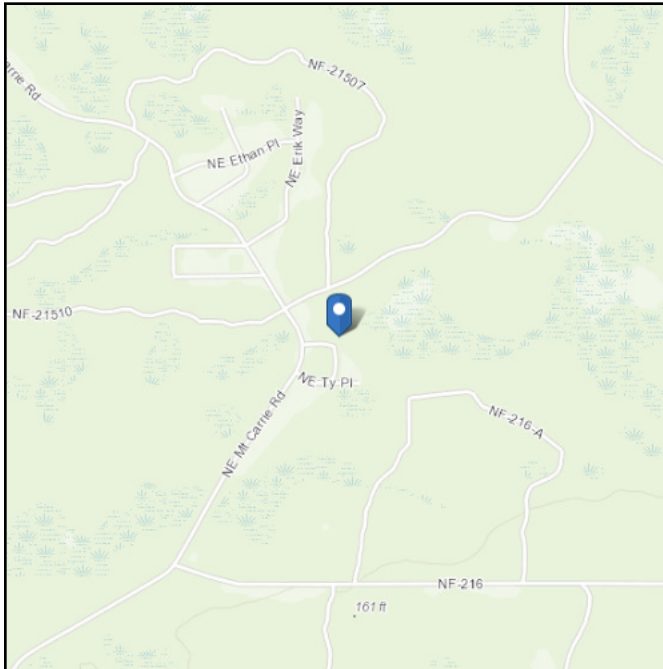
Soil Profile														
Groundwater Depth		3.5	# of Layers		9									
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y _{soil} (pcf)	Y _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2.75	2.75	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2.75	3.5	0.75	120	150	0	34	0.000	0.000	0.00	0.00			Cohesionless
3	3.5	5	1.5	57.6	87.6	0	34	0.000	0.000	0.00	0.00			Cohesionless
4	5	14.5	9.5	57.6	87.6	0	34	0.000	0.000	0.60	0.48			Cohesionless
5	14.5	25	10.5	52.6	87.6	0	30	0.000	0.000	0.70	0.56			Cohesionless
6	25	43.5	18.5	52.6	87.6	0	32	0.000	0.000	1.10	0.88			Cohesionless
7	43.5	48.5	5	62.6	87.6	10	0	4.50	4.50	3.20	2.56			Cohesive
8	48.5	53.5	5	57.6	87.6	4.5	0	2.19	2.19	4.00	3.20			Cohesive
9	53.5	55	1.5	82.6	87.6	25	0	11.25	11.25	10.00	8.00	75		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)

Elevation: 156.8 ft (NAVD 88)
Latitude: 30.23435
Longitude: -82.498953



Wind

Results:

Wind Speed	118 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: Fri Dec 03 2021

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

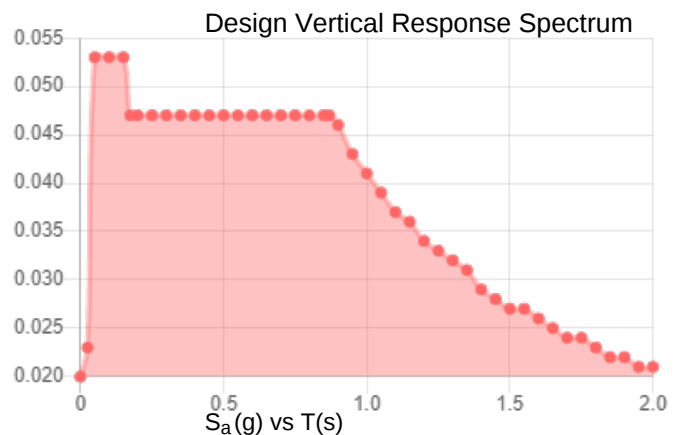
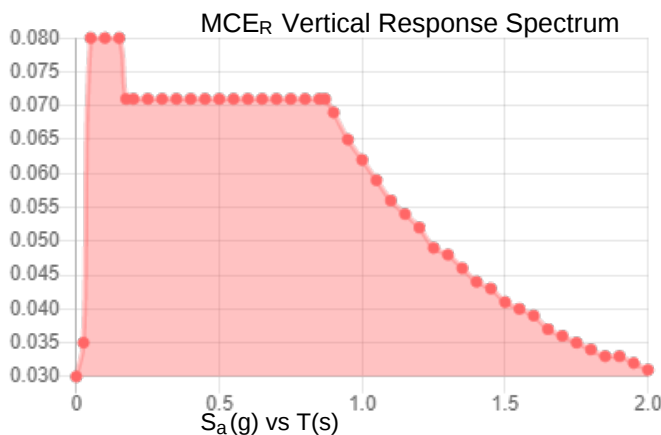
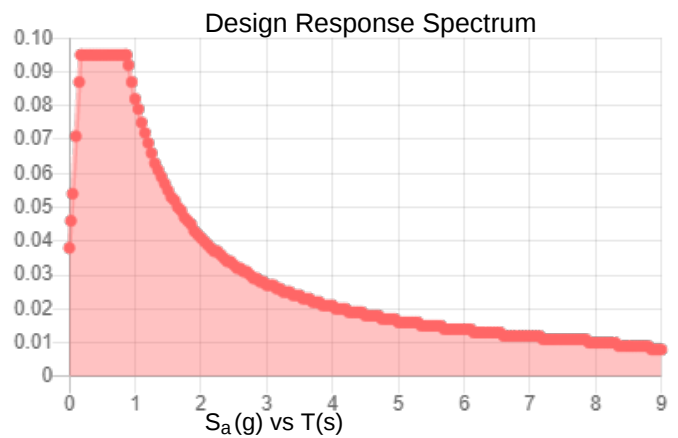
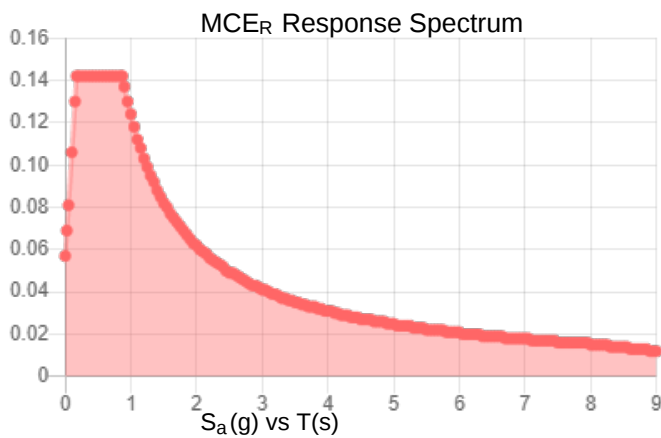
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.089	S_{D1} :	0.082
S_1 :	0.052	T_L :	8
F_a :	1.6	PGA :	0.042
F_v :	2.4	PGA _M :	0.068
S_{MS} :	0.142	F_{PGA} :	1.6
S_{M1} :	0.124	I_e :	1
S_{DS} :	0.095	C_v :	0.7

Seismic Design Category B



Data Accessed: Fri Dec 03 2021

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.

Results:

Ice Thickness: 0.25 in.
Concurrent Temperature: 25 F
Gust Speed 30 mph

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

Date Accessed: Fri Dec 03 2021

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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