



SBA Communications Corporation
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Structural Analysis Report

Client: AT&T

Client Site ID / Name: 15743284 / Fort White South
Application #: 221788, v2

SBA Site ID / Name: FL10337-A / Truett/Ft. White

250' Modified Self Supporting Tower

19039 SW SR 47
Ft. White, FL 32038
Lat: 29.912947, Long: -82.715206

Project number: FL10337-ATT-041123

Analysis Results

Tower	102.8%	Acceptable
Foundation	64.0%	Pass

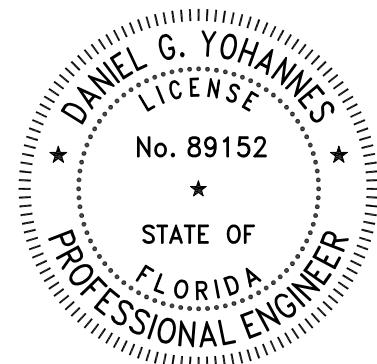
Change in tower stress due to mount modification / replacement	N/A
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This item has been digitally signed and sealed by Daniel G. Yohannes, PE, on 4/17/2023.
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April 17, 2023

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Introduction

The purpose of this report is to summarize the analysis results on the 250' modified Self Supporting Tower to support the proposed antennas and transmissions lines in addition to those currently installed.

Table 1 List of Documents Used

Item	Document
Tower Design	Sabre, Job # 04-01026 , Dated 01/14/2004
Foundation Design	Sabre, Job # 04-01026 , Dated 01/14/2004
Geotechnical report	SDII, Project # 3006609B, dated 01/12/2004
Modification drawings	FDH, Project # 11-04183E S2, dated 08/06/2011
Latest SA Report	TES, Project # 116074, Dated 09/22/2021

Analysis Criteria

Table 2 Code Related Data

Jurisdiction (State/County/City)	Florida / Columbia / Ft. White
Governing Codes	ANSI/TIA-222-H, 2018 IBC /Florida Building Code, 7 th Edition (2020)
Ultimate wind speed (3-Sec gust)	120 mph
Service Wind Speed (3-Sec gust)	60 mph
Wind Speed with ice (3-Sec gust)	30 mph
Ice Thickness	0.25"
Structural class	II
Exposure Category	C
Topographic Category	1
Crest Height	0 ft.
Ground Elevation	75.99 ft.
Seismic Parameter S_s	0.079
Seismic Parameter S_1	0.048

This structural analysis is based upon the tower being classified as a risk category II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Appurtenance Loading

Existing Loading:

Table 3 Existing Appurtenances

Mount Elev. (ft)	CL Elev. (ft)	Type	Qty	Manufacturer	Model	Feed Line Size	Mount Type Qty.	Carrier
246	246	Panel	6	JMA Wireless	X7CQAP-86-865-VRO	(13) 1-5/8" Coax (3) 1-5/8" Hybrid (1) 1-1/4" Hybrid	(3) Sector Frames (3) V-BRACING KIT (1) 36" LONG, P2.0 STD PIPE (1) 2' PANEL STAND-OFF MOUNT	Verizon
		Panel	2	JMA Wireless	MX06FRO840-02			
		Panel	4	Ericsson	AIR 6449			
		RRU	4	Ericsson	8843			
		RRU	3	Ericsson	4449 B5/B12			
		Combiner	3	Commscope	CHB626-43-2X			
		OVP	2	Raycap	RCMDC 6627 PF 48			
212	217.7	Omni	2	Antel	BCD-80010	(3) 1-5/8"	(2) Standoff Mount	*Nextel
175	175	Dish	2	-	HPD6-59	(2) 3/8" LMR400	(2) Pipe Mounts	*North Florida Broadband
		ODU	2	Ceragon	IP 10			

*Note: Nextel and North Florida Broadband are terminated, but their equipment is abandoned.

Proposed Loading:

Information pertaining to proposed antennas and transmission lines were based upon the Application #: 221788, v2 from AT&T and is listed in Table 4.

Table 4 Proposed Appurtenances

Mount Elev. (ft)	CL Elev. (ft)	Type	Qty	Manufacturer	Model	Feed Line Size	Mount Type Qty.	Carrier
220	221	Panel	3	Ericsson	AIR 6449 N77D	(9) 0.957" DC Power (3) 3/8" RET (3) 3/8" Fiber	(3) Sector Mounts (Sabre C10857278C)	AT&T
	220	Panel	6	Commscope	NNH4-85B-R6			
		RRU	6	Ericsson	4449 B5/B12			
		RRU	3	Ericsson	4478 B14			
		RRU	3	Ericsson	4415 B30			
		RRU	6	Ericsson	4460 B25 B66			
		OVP	4	Raycap	DC9-48-60-24-8C-EV			
	218	Panel	3	Ericsson	AIR 6419 N77G			

Note: AT&T loading includes FirstNET equipment

Analysis Results

Tower

The results of the structural analysis are shown below in table 5. Additional information for the tower analysis is provided within the Appendix.

Table 5 Tower Analysis Summary

Structural Component	% capacity	Analysis Result
Leg	102.4	Acceptable
Diagonal	86.2	Pass
Horizontal	76.9	Pass
Top girt	36.3	Pass
Bolt	87.8	Pass
Anchor Bolt	66.6	Pass

Foundation

The results of the foundation analysis are shown below in table 6. Additional information for the foundation analysis is provided within the Appendix.

Table 6 Foundation Analysis Summary

Structural Component	Max Usage (%)	Analysis Result
Foundation	64.0	Pass

Conclusions

Based on the analysis results, the existing tower and foundation were found to be **acceptable** to safely support the equipment listed in this analysis. No modification to the tower and foundation is needed at this time.

Installation Requirements

This analysis was performed under the assumption that the carrier will place the proposed equipment and feed lines at the installation height listed in Table 4 and in accordance with the coax layout shown. TMAs and RRUs are to be installed on existing mounts behind tenant's antennas unless otherwise noted. No equipment is to be installed directly in the climbing path. All equipment is to be installed per mount manufacturer specifications. In case site conditions do not allow for the required installation parameters to be met the carrier must notify SBA Communications Corporation engineers for approval of an alternative placement.

Assumptions and Limitations

Assumptions

This analysis was completed based on the following assumptions:

- Tower and foundation were built in accordance to manufacturer specifications.
- Tower and foundation has been properly maintained in accordance with the manufacturer's specifications
- All existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion
- Welds and bolts are assumed able to carry their intended original design loads.
- The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 3 and 4.
- This analysis may be affected if any assumptions are not valid or have been made in error. SBA should be notified to determine the effect on the structural integrity of the tower.

Limitations

The computer generated analysis performed by the tower software is limited to theoretical capacities of the towers structural members and does not account for any missing or damaged members or connections. The tower and foundation are assumed to have been properly designed, fabricated, installed and maintained, barring any conflicting findings from the most recent inspection.

SBA Communications Corporation has used its due diligence to verify the information provided to perform this analysis. It is unreasonable to perform a more detailed inspection of a tower and its components. This report is not a condition assessment of the tower or foundation.

Appendix

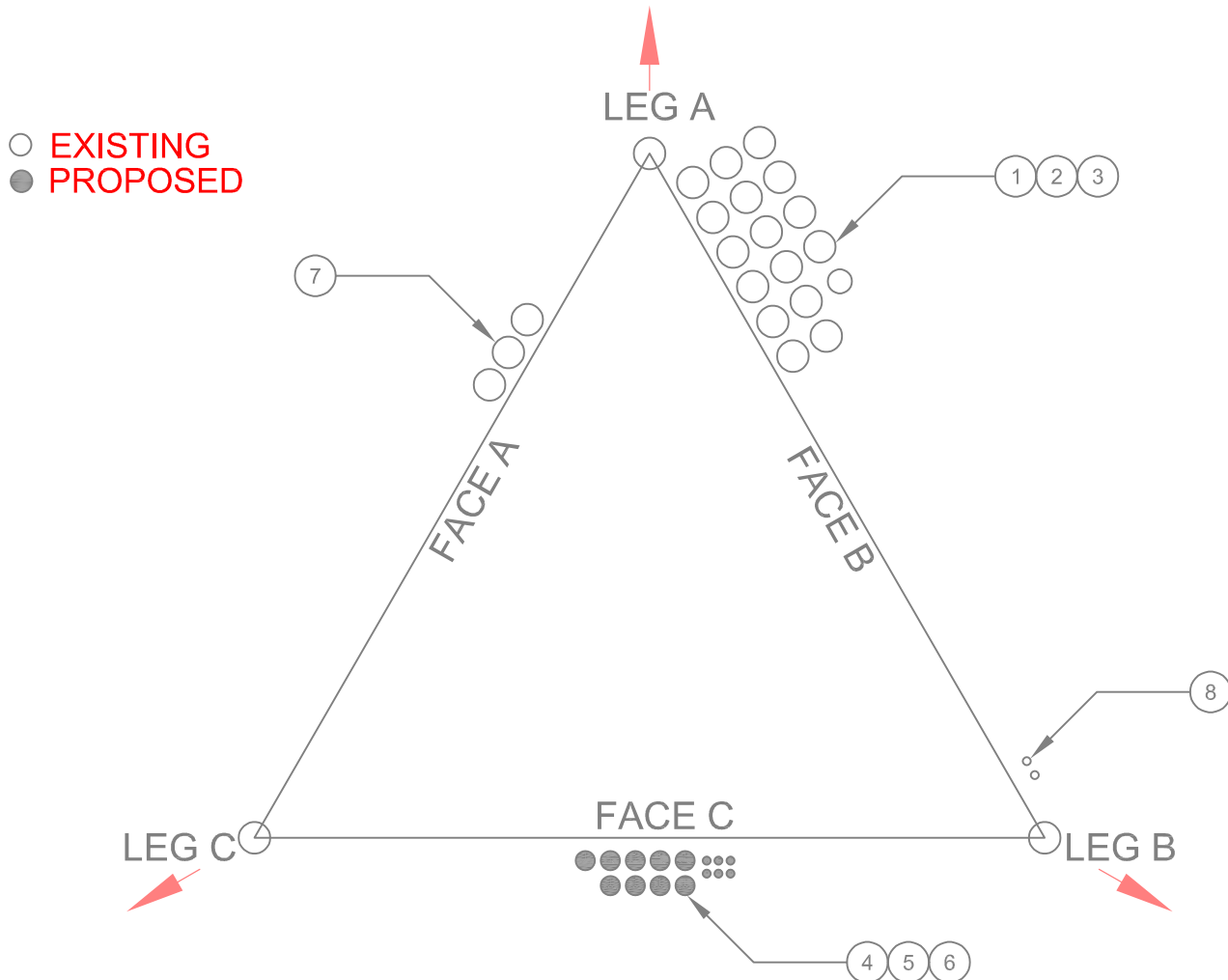
A diagram of a 240-foot lattice tower. The tower is a blue lattice structure. At the top, there are two sets of green equipment (antennas) mounted on a horizontal beam. Below these, there are two sets of green equipment (antennas) mounted on a horizontal beam. At the 160-foot mark, there are two green circular structures (possibly radars or antennas) mounted on the tower. The tower is labeled with heights in feet: 0.0 ft, 20.0 ft, 30.0 ft, 40.0 ft, 60.0 ft, 80.0 ft, 100.0 ft, 120.0 ft, 140.0 ft, 160.0 ft, 180.0 ft, 200.0 ft, 220.0 ft, and 240.0 ft.

A free body diagram of a tower section. A vertical line represents the tower. At the top, a downward arrow is labeled "AXIAL 67 K". A horizontal arrow pointing to the right is labeled "SHEAR 61 K". A curved arrow pointing downwards is labeled "MOMENT 8527 kip-ft". At the base, a horizontal arrow pointing to the right is labeled "TORQUE 46 kip-ft". Below the base, the text "REACTIONS - 120 mph WIND" is written.

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 120 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: 102.8%

	SBA Communications Corporation		Job:	
	8051 Congress Avenue Boca Raton, FL 33487 Phone: 214.570.8110 ext 2612 FAX:		Project: <u>FL10337-ATT-041123</u>	
		Client:	Drawn by: Asmerom	App'd:
		Code: TIA-222-H	Date: 04/11/23	Scale: NTS
		Path:		Dwg No: E-1

COAX LAYOUT



FL10337-A					
#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Verizon	1-5/8"	13	246	
2	Verizon	1-5/8"	3	246	Hybrid
3	Verizon	1-1/4"	1	246	Hybrid
4	AT&T	0.957"	9	220	DC Power (Proposed)
5	AT&T	3/8"	3	220	RET (Proposed)
6	AT&T	3/8"	3	220	Fiber (Proposed)
7	Nextel	1-5/8"	3	212	
8	NFB	3/8"	2	175	LMR400

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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 5.00 ft at the top and 25.00 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: 75.99 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category C.

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

Topographic Category: 1.

Crest Height: 0.00 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.

Pressures are calculated at each section.

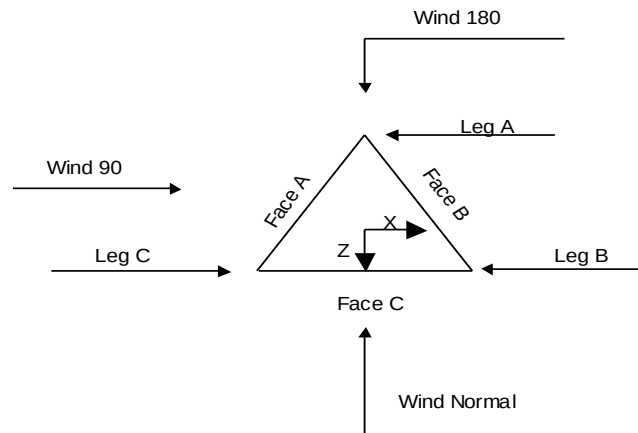
Stress ratio used in tower member design is 1.

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. 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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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			5.00	1	10.00
T2	240.00-220.00			5.00	1	20.00
T3	220.00-200.00			5.00	1	20.00
T4	200.00-180.00			5.00	1	20.00
T5	180.00-160.00			7.00	1	20.00
T6	160.00-140.00			9.00	1	20.00
T7	140.00-120.00			11.00	1	20.00
T8	120.00-100.00			13.00	1	20.00
T9	100.00-80.00			15.00	1	20.00
T10	80.00-60.00			17.00	1	20.00
T11	60.00-40.00			19.00	1	20.00
T12	40.00-30.00			21.00	1	10.00
T13	30.00-20.00			22.00	1	10.00
T14	20.00-0.00			23.00	1	20.00

Tower Section Geometry (cont'd)

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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	250.00-240.00	5.00	X Brace	No	No	0.0000	0.0000
T2	240.00-220.00	5.00	X Brace	No	No	0.0000	0.0000
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	6.67	X Brace	No	No	0.0000	0.0000
T7	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T8	120.00-100.00	6.67	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
T11	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T12	40.00-30.00	10.00	X Brace	No	No	0.0000	0.0000
T13	30.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T14	20.00-0.00	10.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 250.00-240.00	Pipe	P2.5x.203 (2.875 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 240.00-220.00	Pipe	P2.5x.203 (2.875 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 220.00-200.00	Pipe	P2.5x.552 (2.875 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 200.00-180.00	Pipe	P3x.437 (3.50 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 180.00-160.00	Pipe	P 4 SCH 120	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 160.00-140.00	Pipe	P4x.531 (4.50 OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 140.00-120.00	Pipe	P5X0.5 (5.5625OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 120.00-100.00	Pipe	P6x.432 (6.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 100.00-80.00	Pipe	P6x.432 (6.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T10 80.00-60.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3x3 1/2x1/4 (SLV)	A36 (36 ksi)
T11 60.00-40.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 40.00-30.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3 1/2x4x1/4 (SLV)	A36 (36 ksi)
T13 30.00-20.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3 1/2x4x5/16 (SLV)	A36 (36 ksi)
T14 20.00-0.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)

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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	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 240.00-220.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T3 220.00-200.00	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T4 200.00-180.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Flat Bar		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
T14 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3 1/2x1/4 (SLV)	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
T14 20.00-0.00	Solid Round		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Redundant Bracing Grade	Redundant Type	Redundant Size	K Factor
T14 20.00-0.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 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 250.00-240.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 240.00-220.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 220.00-200.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 200.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T12 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T13 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T14 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	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
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

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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 30.00-20.00	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
T14 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 40.00-30.00	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 30.00-20.00	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
T14 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

Tower Section Geometry (cont'd)

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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 120.00-100.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9 100.00-80.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10 80.00-60.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T11 60.00-40.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T12 40.00-30.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T13 30.00-20.00	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T14 20.00-0.00	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
	A325N		A325N		A325N		A325N		A325N		A325N		A325N	

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
*** Climbing Ladder	A	No	No	Af (CaAa)	250.00 - 0.00	0.0000	0	1	1	2.5000	1.0000		7.90
Safety Line 3/8 ***	A	No	No	Ar (CaAa)	250.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22
Feedline Ladder (Af) 1.5"	B	No	No	Af (CaAa)	246.00 - 0.00	0.0000	-0.4	1	1	0.5000	1.5000		4.20
(13) 1-5/8" & (3) 1-5/8" Hybrid	B	No	No	Ar (CaAa)	246.00 - 0.00	0.0000	-0.4	16	6	0.5000	1.9800		0.82
1-1/4" Hybrid	B	No	No	Ar (CaAa)	246.00 - 0.00	0.0000	-0.4	1	1	0.5000	1.2500		0.66
*** Feedline Ladder (Af) 1.5"	C	No	No	Af (CaAa)	220.00 - 0.00	0.0000	0	1	1	0.5000	1.5000		4.20
0.957" DC Power	C	No	No	Ar (CaAa)	220.00 - 0.00	0.0000	0	9	5	0.5000	0.9570		0.33
(3) 3/8" RET & (3) 3/8" Fiber ***	C	No	No	Ar (CaAa)	220.00 - 0.00	0.0000	0.02	6	3	0.5000	0.4400		0.08
Feedline Ladder (Af) 1.5"	A	No	No	Af (CaAa)	212.00 - 0.00	0.0000	0.1	1	1	0.5000	1.5000		4.20
LDF7-50A (1- 5/8 FOAM) ***	A	No	No	Ar (CaAa)	212.00 - 0.00	0.0000	0.1	3	3	0.5000 1.9800	1.9800		0.82

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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
Feedline Ladder (Af) 1.5"	B	No	No	Af (CaAa)	175.00 - 0.00	0.0000	0.4	1	1	0.5000	1.5000		4.20
LDF2-50A (3/8 FOAM) ***	B	No	No	Ar (CaAa)	175.00 - 0.00	0.0000	0.4	2	2	0.5000	0.4400		0.08

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 plf

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	250.00-240.00	A	0.000	0.000	2.042	0.000	0.08
		B	0.000	0.000	21.258	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
T2	240.00-220.00	A	0.000	0.000	4.083	0.000	0.16
		B	0.000	0.000	70.860	0.000	0.36
		C	0.000	0.000	0.000	0.000	0.00
T3	220.00-200.00	A	0.000	0.000	14.211	0.000	0.24
		B	0.000	0.000	70.860	0.000	0.36
		C	0.000	0.000	27.506	0.000	0.15
T4	200.00-180.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	70.860	0.000	0.36
		C	0.000	0.000	27.506	0.000	0.15
T5	180.00-160.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	75.930	0.000	0.42
		C	0.000	0.000	27.506	0.000	0.15
T6	160.00-140.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
		C	0.000	0.000	27.506	0.000	0.15
T7	140.00-120.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
		C	0.000	0.000	27.506	0.000	0.15
T8	120.00-100.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
		C	0.000	0.000	27.506	0.000	0.15
T9	100.00-80.00	A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45

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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
T10	80.00-60.00	C	0.000	0.000	27.506	0.000	0.15
		A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
T11	60.00-40.00	C	0.000	0.000	27.506	0.000	0.15
		A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
T12	40.00-30.00	C	0.000	0.000	27.506	0.000	0.15
		A	0.000	0.000	10.482	0.000	0.15
		B	0.000	0.000	38.810	0.000	0.22
T13	30.00-20.00	C	0.000	0.000	13.753	0.000	0.08
		A	0.000	0.000	10.482	0.000	0.15
		B	0.000	0.000	38.810	0.000	0.22
T14	20.00-0.00	C	0.000	0.000	13.753	0.000	0.08
		A	0.000	0.000	20.963	0.000	0.30
		B	0.000	0.000	77.620	0.000	0.45
		C	0.000	0.000	27.506	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	250.00-240.00	A	0.305	0.000	0.000	3.264	0.000	0.09
		B		0.000	0.000	15.572	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T2	240.00-220.00	A	0.304	0.000	0.000	6.512	0.000	0.18
		B		0.000	0.000	51.879	0.000	0.77
		C		0.000	0.000	0.000	0.000	0.00
T3	220.00-200.00	A	0.301	0.000	0.000	22.169	0.000	0.31
		B		0.000	0.000	51.839	0.000	0.77
		C		0.000	0.000	34.975	0.000	0.31
T4	200.00-180.00	A	0.298	0.000	0.000	32.566	0.000	0.39
		B		0.000	0.000	51.794	0.000	0.77
		C		0.000	0.000	34.923	0.000	0.31
T5	180.00-160.00	A	0.295	0.000	0.000	32.506	0.000	0.39
		B		0.000	0.000	60.545	0.000	0.86
		C		0.000	0.000	34.865	0.000	0.31
T6	160.00-140.00	A	0.291	0.000	0.000	32.439	0.000	0.39
		B		0.000	0.000	63.385	0.000	0.88
		C		0.000	0.000	34.801	0.000	0.30
T7	140.00-120.00	A	0.287	0.000	0.000	32.363	0.000	0.39
		B		0.000	0.000	63.280	0.000	0.88
		C		0.000	0.000	34.729	0.000	0.30
T8	120.00-100.00	A	0.282	0.000	0.000	32.276	0.000	0.39
		B		0.000	0.000	63.159	0.000	0.88
		C		0.000	0.000	34.646	0.000	0.30
T9	100.00-80.00	A	0.276	0.000	0.000	32.173	0.000	0.39
		B		0.000	0.000	63.017	0.000	0.88
		C		0.000	0.000	34.549	0.000	0.30
T10	80.00-60.00	A	0.270	0.000	0.000	32.047	0.000	0.39
		B		0.000	0.000	62.842	0.000	0.87
		C		0.000	0.000	34.429	0.000	0.30
T11	60.00-40.00	A	0.261	0.000	0.000	31.884	0.000	0.38
		B		0.000	0.000	62.615	0.000	0.87

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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
T12	40.00-30.00	C	0.251	0.000	0.000	34.273	0.000	0.30
		A		0.000	0.000	15.858	0.000	0.19
		B		0.000	0.000	31.192	0.000	0.43
		C		0.000	0.000	17.057	0.000	0.15
T13	30.00-20.00	A	0.243	0.000	0.000	13.400	0.000	0.18
		B		0.000	0.000	49.022	0.000	0.35
		C		0.000	0.000	21.534	0.000	0.13
T14	20.00-0.00	A	0.222	0.000	0.000	26.288	0.000	0.35
		B		0.000	0.000	96.257	0.000	0.68
		C		0.000	0.000	41.705	0.000	0.24

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	0.7207	-8.1530	0.2781	-7.7890
T2	240.00-220.00	1.3044	-11.7205	0.8681	-11.1791
T3	220.00-200.00	0.1701	-8.5507	-0.2133	-7.7375
T4	200.00-180.00	-0.4306	-9.8632	-0.8675	-9.0783
T5	180.00-160.00	0.5360	-10.7490	0.4111	-9.4631
T6	160.00-140.00	0.9101	-12.1121	0.8994	-10.6552
T7	140.00-120.00	0.9439	-13.4292	0.9237	-11.6524
T8	120.00-100.00	0.9077	-13.6967	0.8903	-11.8784
T9	100.00-80.00	1.0676	-16.6049	1.0349	-14.2214
T10	80.00-60.00	1.0712	-17.1701	1.0274	-14.5611
T11	60.00-40.00	1.0392	-17.2534	1.0139	-14.9093
T12	40.00-30.00	1.0617	-17.9659	1.0370	-15.5834
T13	30.00-20.00	1.0758	-18.4146	1.0508	-16.0044
T14	20.00-0.00	0.9461	-16.6411	0.9366	-14.7774

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	2	Climbing Ladder	240.00 - 250.00	0.6000	0.6000
T1	3	Safety Line 3/8	240.00 - 250.00	0.6000	0.6000
T1	5	Feedline Ladder (Af) 1.5"	240.00 - 246.00	0.6000	0.6000
T1	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	240.00 - 246.00	0.6000	0.6000
T1	7	1-1/4" Hybrid	240.00 - 246.00	0.0000	0.0000
T2	2	Climbing Ladder	220.00 - 240.00	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_a No Ice</i>	<i>K_a Ice</i>
T2	3	Safety Line 3/8	220.00 - 240.00	0.6000	0.6000
T2	5	Feedline Ladder (Af) 1.5"	220.00 - 240.00	0.6000	0.6000
T2	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	220.00 - 240.00	0.6000	0.6000
T2	7	1-1/4" Hybrid	220.00 - 240.00	0.0000	0.0000
T3	2	Climbing Ladder	200.00 - 220.00	0.6000	0.6000
T3	3	Safety Line 3/8	200.00 - 220.00	0.6000	0.6000
T3	5	Feedline Ladder (Af) 1.5"	200.00 - 220.00	0.6000	0.6000
T3	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	200.00 - 220.00	0.6000	0.6000
T3	7	1-1/4" Hybrid	200.00 - 220.00	0.0000	0.0000
T3	9	Feedline Ladder (Af) 1.5"	200.00 - 220.00	0.6000	0.6000
T3	10	0.957" DC Power	200.00 - 220.00	0.6000	0.6000
T3	11	(3) 3/8" RET & (3) 3/8" Fiber	200.00 - 220.00	0.6000	0.6000
T3	13	Feedline Ladder (Af) 1.5"	200.00 - 212.00	0.6000	0.6000
T3	14	LDF7-50A (1-5/8 FOAM)	200.00 - 212.00	0.6000	0.6000
T4	2	Climbing Ladder	180.00 - 200.00	0.6000	0.6000
T4	3	Safety Line 3/8	180.00 - 200.00	0.6000	0.6000
T4	5	Feedline Ladder (Af) 1.5"	180.00 - 200.00	0.6000	0.6000
T4	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	180.00 - 200.00	0.6000	0.6000
T4	7	1-1/4" Hybrid	180.00 - 200.00	0.0000	0.0000
T4	9	Feedline Ladder (Af) 1.5"	180.00 - 200.00	0.6000	0.6000
T4	10	0.957" DC Power	180.00 - 200.00	0.6000	0.6000
T4	11	(3) 3/8" RET & (3) 3/8" Fiber	180.00 - 200.00	0.6000	0.6000
T4	13	Feedline Ladder (Af) 1.5"	180.00 - 200.00	0.6000	0.6000
T4	14	LDF7-50A (1-5/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T5	2	Climbing Ladder	160.00 - 180.00	0.6000	0.6000
T5	3	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T5	5	Feedline Ladder (Af) 1.5"	160.00 - 180.00	0.6000	0.6000
T5	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	160.00 - 180.00	0.6000	0.6000
T5	7	1-1/4" Hybrid	160.00 - 180.00	0.0000	0.0000

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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_a No Ice</i>	<i>K_a Ice</i>
T5	9	Feedline Ladder (Af) 1.5"	160.00 - 180.00	0.6000	0.6000
T5	10	0.957" DC Power	160.00 - 180.00	0.6000	0.6000
T5	11	(3) 3/8" RET & (3) 3/8" Fiber	160.00 - 180.00	0.6000	0.6000
T5	13	Feedline Ladder (Af) 1.5"	160.00 - 180.00	0.6000	0.6000
T5	14	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T5	16	Feedline Ladder (Af) 1.5"	160.00 - 175.00	0.6000	0.6000
T5	17	LDF2-50A (3/8 FOAM)	160.00 - 175.00	0.6000	0.6000
T6	2	Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T6	3	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T6	5	Feedline Ladder (Af) 1.5"	140.00 - 160.00	0.6000	0.6000
T6	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	140.00 - 160.00	0.6000	0.6000
T6	7	1-1/4" Hybrid	140.00 - 160.00	0.0000	0.0000
T6	9	Feedline Ladder (Af) 1.5"	140.00 - 160.00	0.6000	0.6000
T6	10	0.957" DC Power	140.00 - 160.00	0.6000	0.6000
T6	11	(3) 3/8" RET & (3) 3/8" Fiber	140.00 - 160.00	0.6000	0.6000
T6	13	Feedline Ladder (Af) 1.5"	140.00 - 160.00	0.6000	0.6000
T6	14	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T6	16	Feedline Ladder (Af) 1.5"	140.00 - 160.00	0.6000	0.6000
T6	17	LDF2-50A (3/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T7	2	Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T7	3	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T7	5	Feedline Ladder (Af) 1.5"	120.00 - 140.00	0.6000	0.6000
T7	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	120.00 - 140.00	0.6000	0.6000
T7	7	1-1/4" Hybrid	120.00 - 140.00	0.0000	0.0000
T7	9	Feedline Ladder (Af) 1.5"	120.00 - 140.00	0.6000	0.6000
T7	10	0.957" DC Power	120.00 - 140.00	0.6000	0.6000
T7	11	(3) 3/8" RET & (3) 3/8" Fiber	120.00 - 140.00	0.6000	0.6000
T7	13	Feedline Ladder (Af) 1.5"	120.00 - 140.00	0.6000	0.6000
T7	14	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	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_a No Ice</i>	<i>K_a Ice</i>
T7	16	Feedline Ladder (Af) 1.5"	120.00 - 140.00	0.6000	0.6000
T7	17	LDF2-50A (3/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T8	2	Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T8	3	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T8	5	Feedline Ladder (Af) 1.5"	100.00 - 120.00	0.6000	0.6000
T8	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	100.00 - 120.00	0.6000	0.6000
T8	7	1-1/4" Hybrid	100.00 - 120.00	0.0000	0.0000
T8	9	Feedline Ladder (Af) 1.5"	100.00 - 120.00	0.6000	0.6000
T8	10	0.957" DC Power	100.00 - 120.00	0.6000	0.6000
T8	11	(3) 3/8" RET & (3) 3/8" Fiber	100.00 - 120.00	0.6000	0.6000
T8	13	Feedline Ladder (Af) 1.5"	100.00 - 120.00	0.6000	0.6000
T8	14	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T8	16	Feedline Ladder (Af) 1.5"	100.00 - 120.00	0.6000	0.6000
T8	17	LDF2-50A (3/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T9	2	Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T9	3	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T9	5	Feedline Ladder (Af) 1.5"	80.00 - 100.00	0.6000	0.6000
T9	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	80.00 - 100.00	0.6000	0.6000
T9	7	1-1/4" Hybrid	80.00 - 100.00	0.0000	0.0000
T9	9	Feedline Ladder (Af) 1.5"	80.00 - 100.00	0.6000	0.6000
T9	10	0.957" DC Power	80.00 - 100.00	0.6000	0.6000
T9	11	(3) 3/8" RET & (3) 3/8" Fiber	80.00 - 100.00	0.6000	0.6000
T9	13	Feedline Ladder (Af) 1.5"	80.00 - 100.00	0.6000	0.6000
T9	14	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T9	16	Feedline Ladder (Af) 1.5"	80.00 - 100.00	0.6000	0.6000
T9	17	LDF2-50A (3/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T10	2	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T10	3	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T10	5	Feedline Ladder (Af) 1.5"	60.00 - 80.00	0.6000	0.6000
T10	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	60.00 - 80.00	0.6000	0.6000
T10	7	1-1/4" Hybrid	60.00 - 80.00	0.0000	0.0000
T10	9	Feedline Ladder (Af) 1.5"	60.00 - 80.00	0.6000	0.6000
T10	10	0.957" DC Power	60.00 - 80.00	0.6000	0.6000
T10	11	(3) 3/8" RET & (3) 3/8" Fiber	60.00 - 80.00	0.6000	0.6000
T10	13	Feedline Ladder (Af) 1.5"	60.00 - 80.00	0.6000	0.6000
T10	14	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T10	16	Feedline Ladder (Af) 1.5"	60.00 - 80.00	0.6000	0.6000
T10	17	LDF2-50A (3/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T11	2	Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T11	3	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T11	5	Feedline Ladder (Af) 1.5"	40.00 - 60.00	0.6000	0.6000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T11	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	40.00 - 60.00	0.6000	0.6000
T11	7	1-1/4" Hybrid	40.00 - 60.00	0.0000	0.0000
T11	9	Feedline Ladder (Af) 1.5"	40.00 - 60.00	0.6000	0.6000
T11	10	0.957" DC Power	40.00 - 60.00	0.6000	0.6000
T11	11	(3) 3/8" RET & (3) 3/8" Fiber	40.00 - 60.00	0.6000	0.6000
T11	13	Feedline Ladder (Af) 1.5"	40.00 - 60.00	0.6000	0.6000
T11	14	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T11	16	Feedline Ladder (Af) 1.5"	40.00 - 60.00	0.6000	0.6000
T11	17	LDF2-50A (3/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T12	2	Climbing Ladder	30.00 - 40.00	0.6000	0.6000
T12	3	Safety Line 3/8	30.00 - 40.00	0.6000	0.6000
T12	5	Feedline Ladder (Af) 1.5"	30.00 - 40.00	0.6000	0.6000
T12	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	30.00 - 40.00	0.6000	0.6000
T12	7	1-1/4" Hybrid	30.00 - 40.00	0.0000	0.0000
T12	9	Feedline Ladder (Af) 1.5"	30.00 - 40.00	0.6000	0.6000
T12	10	0.957" DC Power	30.00 - 40.00	0.6000	0.6000
T12	11	(3) 3/8" RET & (3) 3/8" Fiber	30.00 - 40.00	0.6000	0.6000
T12	13	Feedline Ladder (Af) 1.5"	30.00 - 40.00	0.6000	0.6000
T12	14	LDF7-50A (1-5/8 FOAM)	30.00 - 40.00	0.6000	0.6000
T12	16	Feedline Ladder (Af) 1.5"	30.00 - 40.00	0.6000	0.6000
T12	17	LDF2-50A (3/8 FOAM)	30.00 - 40.00	0.6000	0.6000
T13	2	Climbing Ladder	20.00 - 30.00	0.6000	0.6000
T13	3	Safety Line 3/8	20.00 - 30.00	0.6000	0.6000
T13	5	Feedline Ladder (Af) 1.5"	20.00 - 30.00	0.6000	0.6000
T13	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	20.00 - 30.00	0.6000	0.6000
T13	7	1-1/4" Hybrid	20.00 - 30.00	0.0000	0.0000
T13	9	Feedline Ladder (Af) 1.5"	20.00 - 30.00	0.6000	0.6000
T13	10	0.957" DC Power	20.00 - 30.00	0.6000	0.6000
T13	11	(3) 3/8" RET & (3) 3/8" Fiber	20.00 - 30.00	0.6000	0.6000
T13	13	Feedline Ladder (Af) 1.5"	20.00 - 30.00	0.6000	0.6000
T13	14	LDF7-50A (1-5/8 FOAM)	20.00 - 30.00	0.6000	0.6000
T13	16	Feedline Ladder (Af) 1.5"	20.00 - 30.00	0.6000	0.6000
T13	17	LDF2-50A (3/8 FOAM)	20.00 - 30.00	0.6000	0.6000
T14	2	Climbing Ladder	0.00 - 20.00	0.6000	0.6000
T14	3	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T14	5	Feedline Ladder (Af) 1.5"	0.00 - 20.00	0.6000	0.6000
T14	6	(13) 1-5/8" & (3) 1-5/8" Hybrid	0.00 - 20.00	0.6000	0.6000
T14	7	1-1/4" Hybrid	0.00 - 20.00	0.0000	0.0000
T14	9	Feedline Ladder (Af) 1.5"	0.00 - 20.00	0.6000	0.6000
T14	10	0.957" DC Power	0.00 - 20.00	0.6000	0.6000
T14	11	(3) 3/8" RET & (3) 3/8" Fiber	0.00 - 20.00	0.6000	0.6000
T14	13	Feedline Ladder (Af) 1.5"	0.00 - 20.00	0.6000	0.6000
T14	14	LDF7-50A (1-5/8 FOAM)	0.00 - 20.00	0.6000	0.6000
T14	16	Feedline Ladder (Af) 1.5"	0.00 - 20.00	0.6000	0.6000
T14	17	LDF2-50A (3/8 FOAM)	0.00 - 20.00	0.6000	0.6000

User Defined Loads - Seismic

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
SL1	250.00	0.00	0.0000	0.08	0.00	0.00	0.33
SL2	240.00	0.00	0.0000	0.02	0.00	0.00	0.05
SL3	220.00	0.00	0.0000	0.11	0.00	0.00	0.43
SL4	200.00	0.00	0.0000	0.04	0.00	0.00	0.08
SL5	180.00	0.00	0.0000	0.06	0.00	0.00	0.13
SL6	160.00	0.00	0.0000	0.05	0.00	0.00	0.10
SL7	140.00	0.00	0.0000	0.06	0.00	0.00	0.10
SL8	120.00	0.00	0.0000	0.06	0.00	0.00	0.09
SL9	100.00	0.00	0.0000	0.07	0.00	0.00	0.07
SL10	80.00	0.00	0.0000	0.08	0.00	0.00	0.08
SL11	60.00	0.00	0.0000	0.09	0.00	0.00	0.06
SL12	40.00	0.00	0.0000	0.05	0.00	0.00	0.01
SL13	30.00	0.00	0.0000	0.05	0.00	0.00	0.01
SL14	20.00	0.00	0.0000	0.12	0.00	0.00	0.02

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_{AA} Front ft ²	C_{AA} Side ft ²	Weight K

(2) X7CQAP-86-865-VRO w/mount pipe (96x14.6x7.3)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.44 14.04	0.08 0.18
(2) X7CQAP-86-865-VRO w/mount pipe (96x14.6x7.3)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.44 14.04	0.08 0.18
(2) X7CQAP-86-865-VRO w/mount pipe (96x14.6x7.3)	C	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.44 14.04	0.08 0.18
MX06FRO840-02 w/mount pipe (95.9x19.8x10.7)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	17.20 17.83	0.13 0.25
MX06FRO840-02 w/mount pipe (95.9x19.8x10.7)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	17.20 17.83	0.13 0.25
AIR 6449 w/mount pipe (30.4x15.9x8.1)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	5.33 6.15	0.11 0.16
AIR 6449 w/mount pipe (30.4x15.9x8.1)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	5.33 6.15	0.11 0.16
(2) AIR 6449 w/mount pipe (30.4x15.9x8.1)	C	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	5.33 6.15	0.11 0.16
(2) 8843 (18x13.2x9.4)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.98 2.16	0.07 0.09

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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</i>		<i>C_{AA} Front</i>	<i>C_{AA} Side</i>	<i>Weight</i>
				°	ft		ft ²	ft ²	K
8843 (18x13.2x9.4)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.98 2.16	1.41 1.57	0.07 0.09
8843 (18x13.2x9.4)	C	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.98 2.16	1.41 1.57	0.07 0.09
4449 B5/B12 (17.9x13.19x9.44)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
4449 B5/B12 (17.9x13.19x9.44)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
4449 B5/B12 (17.9x13.19x9.44)	C	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
CHB626-43-2X (7.12x14.6x3.4)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	0.87 0.99	0.20 0.26	0.02 0.03
CHB626-43-2X (7.12x14.6x3.4)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	0.87 0.99	0.20 0.26	0.02 0.03
CHB626-43-2X (7.12x14.6x3.4)	C	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	0.87 0.99	0.20 0.26	0.02 0.03
RCMDC-6627-PF-48 (29.5x16.5x12.6)	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	4.06 4.32	3.10 3.34	0.03 0.07
RCMDC-6627-PF-48 (29.5x16.5x12.6)	B	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	4.06 4.32	3.10 3.34	0.03 0.07
Sector Mount (Site Pro1 Super XLD VFA12-HD)	A	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.20 17.82	9.20 12.42	0.66 0.89
Sector Mount (Site Pro1 Super XLD VFA12-HD)	B	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.20 17.82	9.20 12.42	0.66 0.89
Sector Mount (Site Pro1 Super XLD VFA12-HD)	C	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	13.20 17.82	9.20 12.42	0.66 0.89
Mount Mod (V-bracing)	A	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	3.01 4.06	3.01 4.06	0.15 0.20
Mount Mod (V-bracing)	B	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	3.01 4.06	3.01 4.06	0.15 0.20
Mount Mod (V-bracing)	C	From Leg	1.50 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	3.01 4.06	3.01 4.06	0.15 0.20
Standoff Mount	A	From Leg	3.00 0.00 0.00	0.0000	246.00	No Ice 1/2" Ice	0.53 0.78	1.52 2.07	0.03 0.04

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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
(2) NNH4-85B-R6 w/mount pipe (72x19.6x7.8)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	12.75 13.45	7.65 8.94	0.11 0.20
(2) NNH4-85B-R6 w/mount pipe (72x19.6x7.8)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	12.75 13.45	7.65 8.94	0.11 0.20
(2) NNH4-85B-R6 w/mount pipe (72x19.6x7.8)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	12.75 13.45	7.65 8.94	0.11 0.20
AIR6449 N77D w/mount pipe (30.6x15.9x10.6)	A	From Leg	3.00 0.00 1.00	0.0000	220.00	No Ice 1/2" Ice	5.35 6.18	4.64 5.69	0.12 0.18
AIR6449 N77D w/mount pipe (30.6x15.9x10.6)	B	From Leg	3.00 0.00 1.00	0.0000	220.00	No Ice 1/2" Ice	5.35 6.18	4.64 5.69	0.12 0.18
AIR6449 N77D w/mount pipe (30.6x15.9x10.6)	C	From Leg	3.00 0.00 1.00	0.0000	220.00	No Ice 1/2" Ice	5.35 6.18	4.64 5.69	0.12 0.18
AIR6419 N77G w/mount pipe (31.1x16.1x7.3)	A	From Leg	3.00 0.00 -2.00	0.0000	220.00	No Ice 1/2" Ice	5.46 6.28	3.92 4.95	0.08 0.13
AIR6419 N77G w/mount pipe (31.1x16.1x7.3)	B	From Leg	3.00 0.00 -2.00	0.0000	220.00	No Ice 1/2" Ice	5.46 6.28	3.92 4.95	0.08 0.13
AIR6419 N77G w/mount pipe (31.1x16.1x7.3)	C	From Leg	3.00 0.00 -2.00	0.0000	220.00	No Ice 1/2" Ice	5.46 6.28	3.92 4.95	0.08 0.13
(2) 4449 B5/B12 (17.9x13.19x9.44)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
(2) 4449 B5/B12 (17.9x13.19x9.44)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
(2) 4449 B5/B12 (17.9x13.19x9.44)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.97 2.14	1.41 1.56	0.07 0.09
4478 B14 (18.1x13.4x8.26)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.02 2.20	1.25 1.40	0.06 0.08
4478 B14 (18.1x13.4x8.26)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.02 2.20	1.25 1.40	0.06 0.08
4478 B14 (18.1x13.4x8.26)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.02 2.20	1.25 1.40	0.06 0.08
4415 B30 (16.5x13.4x5.9)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.84 2.01	0.82 0.94	0.05 0.06
4415 B30 (16.5x13.4x5.9)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.84 2.01	0.82 0.94	0.05 0.06
4415 B30 (16.5x13.4x5.9)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.84 2.01	0.82 0.94	0.05 0.06

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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>	
			0.00						
(2) 4460 B25 B66 (19.56x15.74x12.08)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.57 2.77	1.97 2.15	0.11 0.13
(2) 4460 B25 B66 (19.56x15.74x12.08)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.57 2.77	1.97 2.15	0.11 0.13
(2) 4460 B25 B66 (19.56x15.74x12.08)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	2.57 2.77	1.97 2.15	0.11 0.13
(2) DC9-48-60-24-8C-EV (18.3x10.2x31.4)	A	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.56 1.72	4.79 5.07	0.03 0.06
DC9-48-60-24-8C-EV (18.3x10.2x31.4)	B	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.56 1.72	4.79 5.07	0.03 0.06
DC9-48-60-24-8C-EV (18.3x10.2x31.4)	C	From Leg	3.00 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	1.56 1.72	4.79 5.07	0.03 0.06
Sector Mount (Sabre C10857278C)	A	From Leg	1.50 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	9.12 12.31	6.82 9.21	0.58 0.79
Sector Mount (Sabre C10857278C)	B	From Leg	1.50 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	9.12 12.31	6.82 9.21	0.58 0.79
Sector Mount (Sabre C10857278C)	C	From Leg	1.50 0.00 0.00	0.0000	220.00	No Ice 1/2" Ice	9.12 12.31	6.82 9.21	0.58 0.79

BCD-80010 w/mount pipe (136x2.6x2.6)	B	From Leg	6.00 0.00 5.67	0.0000	212.00	No Ice 1/2" Ice	4.85 6.84	4.85 6.84	0.06 0.10
BCD-80010 w/mount pipe (136x2.6x2.6)	C	From Leg	6.00 0.00 5.67	0.0000	212.00	No Ice 1/2" Ice	4.85 6.84	4.85 6.84	0.06 0.10
Standoff mount	B	From Leg	3.00 0.00 0.00	0.0000	212.00	No Ice 1/2" Ice	2.58 3.39	10.83 13.16	0.14 0.22
Standoff mount	C	From Leg	3.00 0.00 0.00	0.0000	212.00	No Ice 1/2" Ice	2.58 3.39	10.83 13.16	0.14 0.22

IP 10 (19x6x11)	B	From Leg	0.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	0.97 1.11	1.74 1.91	0.02 0.03
IP 10 (19x6x11)	C	From Leg	0.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	0.97 1.11	1.74 1.91	0.02 0.03
Dish Mount Pipe	B	From Leg	0.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	2.25 2.57	2.25 2.57	0.07 0.09
Dish Mount Pipe	C	From Leg	0.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	2.25 2.57	2.25 2.57	0.07 0.09

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft 0.00	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	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K

HPD6-56	B	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		175.00	6.45	No Ice 1/2" Ice	32.76 33.61 0.25 0.43
HPD6-56	C	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		175.00	6.45	No Ice 1/2" Ice	32.76 33.61 0.25 0.43

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

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Comb. No.	Description
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
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

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Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	11.466	47	0.5314	0.0687
T2	240 - 220	10.356	47	0.5285	0.0662
T3	220 - 200	8.215	47	0.4731	0.0536
T4	200 - 180	6.319	47	0.4034	0.0427
T5	180 - 160	4.802	47	0.3108	0.0321
T6	160 - 140	3.607	47	0.2477	0.0266
T7	140 - 120	2.651	47	0.1973	0.0224
T8	120 - 100	1.880	47	0.1577	0.0177
T9	100 - 80	1.265	47	0.1217	0.0136
T10	80 - 60	0.806	47	0.0865	0.0106
T11	60 - 40	0.466	47	0.0642	0.0078
T12	40 - 30	0.217	47	0.0423	0.0052
T13	30 - 20	0.125	47	0.0315	0.0040
T14	20 - 0	0.061	47	0.0208	0.0030

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	SL1	47	11.466	0.5314	0.0687	97831
246.00	(2) X7CQAP-86-865-VRO w/mount pipe (96x14.6x7.3)	47	11.021	0.5317	0.0679	97831
240.00	SL2	47	10.356	0.5285	0.0662	49804
220.00	(2) NNH4-85B-R6 w/mount pipe (72x19.6x7.8)	47	8.215	0.4731	0.0536	18942
212.00	BCD-80010 w/mount pipe (136x2.6x2.6)	47	7.417	0.4473	0.0489	14824
200.00	SL4	47	6.319	0.4034	0.0427	11452
180.00	SL5	47	4.802	0.3108	0.0321	15130
175.00	HPD6-56	47	4.477	0.2919	0.0303	16271
160.00	SL6	47	3.607	0.2477	0.0266	20314
140.00	SL7	47	2.651	0.1973	0.0224	26503
120.00	SL8	47	1.880	0.1577	0.0177	31898
100.00	SL9	47	1.265	0.1217	0.0136	29063
80.00	SL10	47	0.806	0.0865	0.0106	41465
60.00	SL11	47	0.466	0.0642	0.0078	54363
40.00	SL12	47	0.217	0.0423	0.0052	56822
30.00	SL13	47	0.125	0.0315	0.0040	42454
20.00	SL14	47	0.061	0.0208	0.0030	42916

Maximum Tower Deflections - Design Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	45.778	19	2.1178	0.2747
T2	240 - 220	41.319	19	2.1088	0.2648
T3	220 - 200	32.734	19	1.8941	0.2145
T4	200 - 180	25.145	19	1.6128	0.1707
T5	180 - 160	19.086	19	1.2408	0.1285
T6	160 - 140	14.317	19	0.9877	0.1062
T7	140 - 120	10.507	19	0.7861	0.0894
T8	120 - 100	7.435	19	0.6275	0.0709
T9	100 - 80	4.993	19	0.4834	0.0542
T10	80 - 60	3.174	19	0.3431	0.0424
T11	60 - 40	1.830	19	0.2543	0.0314
T12	40 - 30	0.849	19	0.1675	0.0209
T13	30 - 20	0.487	19	0.1247	0.0160
T14	20 - 0	0.234	18	0.0824	0.0120

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	SL1	19	45.778	2.1178	0.2747	26460
246.00	(2) X7CQAP-86-865-VRO w/mount pipe (96x14.6x7.3)	19	43.990	2.1200	0.2717	26460
240.00	SL2	19	41.319	2.1088	0.2648	13403
220.00	(2) NNH4-85B-R6 w/mount pipe (72x19.6x7.8)	19	32.734	1.8941	0.2145	4893
212.00	BCD-80010 w/mount pipe (136x2.6x2.6)	19	29.539	1.7897	0.1958	3759
200.00	SL4	19	25.145	1.6128	0.1707	2852
180.00	SL5	19	19.086	1.2408	0.1285	3780
175.00	HPD6-56	19	17.788	1.1648	0.1211	4056
160.00	SL6	19	14.317	0.9877	0.1062	5073
140.00	SL7	19	10.507	0.7861	0.0894	6608
120.00	SL8	19	7.435	0.6275	0.0709	7952
100.00	SL9	19	4.993	0.4834	0.0542	7280
80.00	SL10	19	3.174	0.3431	0.0424	10377
60.00	SL11	19	1.830	0.2543	0.0314	13648
40.00	SL12	19	0.849	0.1675	0.0209	14288
30.00	SL13	19	0.487	0.1247	0.0160	10769
20.00	SL14	18	0.234	0.0824	0.0120	10758

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	250	Leg	A325N	0.7500	4	0.83	30.10	0.028 	1	Bolt Tension

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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
T2	240	Diagonal	A325X	0.6250	1	3.83	7.88	0.486 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	1	0.24	7.88	0.030 ✓	1	Member Block Shear
		Leg	A325N	0.7500	4	9.64	30.10	0.320 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	4.60	7.88	0.584 ✓	1	Member Block Shear
T3	220	Top Girt	A325N	0.6250	1	0.75	7.88	0.095 ✓	1	Member Block Shear
		Leg	A325N	0.7500	4	26.44	30.10	0.878 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8.39	10.50	0.799 ✓	1	Member Block Shear
T4	200	Top Girt	A325N	0.6250	1	2.02	10.50	0.193 ✓	1	Member Block Shear
		Leg	A325N	1.0000	4	35.55	54.52	0.652 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	3.82	7.88	0.485 ✓	1	Member Block Shear
		Top Girt	A325N	0.6250	1	2.71	7.88	0.344 ✓	1	Member Block Shear
T5	180	Leg	A325N	1.0000	4	42.70	54.52	0.783 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	4.11	7.88	0.522 ✓	1	Member Block Shear
T6	160	Leg	A325N>1'	1.2500	4	49.29	76.32	0.646 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	4.70	9.91	0.475 ✓	1	Member Block Shear
T7	140	Leg	A325N>1'	1.2500	4	55.62	76.32	0.729 ✓	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5.15	9.91	0.520 ✓	1	Member Block Shear
T8	120	Leg	A325N>1'	1.2500	6	41.13	76.32	0.539 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	5.97	10.42	0.572 ✓	1	Member Block Shear
T9	100	Leg	A325N>1'	1.2500	6	44.73	76.32	0.586 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	6.97	13.90	0.502 ✓	1	Member Block Shear
T10	80	Leg	A325N>1'	1.3750	6	48.52	90.95	0.533 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	7.46	13.90	0.537 ✓	1	Member Block Shear
T11	60	Leg	A325N>1'	1.3750	6	52.24	90.95	0.574 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	8.11	14.36	0.565 ✓	1	Member Bearing
T12	40	Diagonal	A325X	0.7500	1	8.62	14.36	0.600 ✓	1	Member Bearing
T13	30	Leg	A325N>1'	1.3750	6	55.88	90.95	0.614 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	8.85	17.94	0.493 ✓	1	Member Bearing
		Diagonal	A325X	0.6250	2	6.73	17.26	0.390 ✓	1	Bolt Shear
T14	20	Horizontal	A325N	0.6250	2	4.48	11.09	0.404 ✓	1	Member Block 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
		Redund Horz 1 Bracing	A325N	0.6250	1	6.96	13.81	0.504 ✓	1	Bolt Shear
		Redund Diag 1 Bracing	A325N	0.6250	1	4.50	13.81	0.326 ✓	1	Bolt 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	250 - 240	P2.5x.203 (2.875 OD)	10.00	5.00	63.3 K=1.00	1.7040	-6.61	57.19	0.116 ¹ ✓
T2	240 - 220	P2.5x.203 (2.875 OD)	20.00	5.00	63.3 K=1.00	1.7040	-43.27	57.19	0.757 ¹ ✓
T3	220 - 200	P2.5x.552 (2.875 OD)	20.00	5.00	71.1 K=1.00	4.0285	-116.75	125.30	0.932 ¹ ✓
T4	200 - 180	P3x.437 (3.50 OD)	20.03	5.01	54.9 K=1.00	4.2051	-156.06	151.75	1.028 ¹ ✗
T5	180 - 160	4.8.1 (1.03 CR) - 79 P 4 SCH 120	20.03	5.01	41.6 K=1.00	5.5780	-187.85	221.18	0.849 ¹ ✓
T6	160 - 140	P4x.531 (4.50 OD)	20.03	6.68	56.6 K=1.00	6.6210	-216.86	235.73	0.920 ¹ ✓
T7	140 - 120	P5X0.5 (5.5625OD)	20.03	6.68	44.6 K=1.00	7.9522	-245.58	309.50	0.793 ¹ ✓
T8	120 - 100	P6x.432 (6.625 OD)	20.03	6.68	36.5 K=1.00	8.4049	-273.80	343.10	0.798 ¹ ✓
T9	100 - 80	P6x.432 (6.625 OD)	20.03	10.02	54.8 K=1.00	8.4049	-299.22	303.75	0.985 ¹ ✓
T10	80 - 60	P8x.5 (8.625 OD)	20.03	10.02	41.8 K=1.00	12.7627	-326.82	505.56	0.646 ¹ ✓
T11	60 - 40	P8x.5 (8.625 OD)	20.03	10.02	41.8 K=1.00	12.7627	-354.48	505.56	0.701 ¹ ✓
T12	40 - 30	P8x.5 (8.625 OD)	10.02	10.02	41.8 K=1.00	12.7627	-368.67	505.56	0.729 ¹ ✓
T13	30 - 20	P8x.5 (8.625 OD)	10.02	10.02	41.8 K=1.00	12.7627	-381.96	505.56	0.756 ¹ ✓
T14	20 - 0	P8x.5 (8.625 OD)	20.03	5.01	20.9 K=1.00	12.7627	-401.07	556.30	0.721 ¹ ✓

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¹ $P_u / \phi P_n$ 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	L1 3/4x1 3/4x3/16	7.07	3.22	114.4 K=1.02	0.6211	-4.04	13.16	0.307 ¹ ✓
T2	240 - 220	L1 3/4x1 3/4x3/16	7.07	3.22	114.4 K=1.02	0.6211	-4.79	13.16	0.364 ¹ ✓
T3	220 - 200	L1 3/4x1 3/4x1/4	7.07	3.22	114.9 K=1.02	0.8125	-8.50	17.11	0.497 ¹ ✓
T4	200 - 180	L1 3/4x1 3/4x3/16	8.40	4.03	140.8 K=1.00	0.6211	-3.42	8.97	0.381 ¹ ✓
T5	180 - 160	L2x2x3/16	10.08	4.82	146.9 K=1.00	0.7150	-4.09	9.49	0.431 ¹ ✓
T6	160 - 140	L2 1/2x2 1/2x3/16	12.58	6.12	148.4 K=1.00	0.9020	-4.91	11.73	0.419 ¹ ✓
T7	140 - 120	L2 1/2x2 1/2x3/16	14.32	6.94	168.2 K=1.00	0.9020	-5.32	9.13	0.583 ¹ ✓
T8	120 - 100	L3x3x3/16	16.11	7.79	156.8 K=1.00	1.0900	-5.79	12.68	0.456 ¹ ✓
T9	100 - 80	L3x3x1/4	19.30	9.47	192.0 K=1.00	1.4400	-7.12	11.18	0.637 ¹ ✓
T10	80 - 60	L3x3 1/2x1/4 (SLV)	21.03	10.25	194.8 K=1.00	1.5600	-7.82	11.76	0.665 ¹ ✓
T11	60 - 40	L3 1/2x3 1/2x1/4	22.81	11.14	192.6 K=1.00	1.6900	-8.59	13.04	0.658 ¹ ✓
T12	40 - 30	L3 1/2x4x1/4 (SLV)	23.71	11.59	189.5 K=1.00	1.8100	-8.31	14.43	0.576 ¹ ✓
T13	30 - 20	L3 1/2x4x5/16 (SLV)	24.62	12.05	198.0 K=1.00	2.2500	-9.61	16.42	0.585 ¹ ✓
T14	20 - 0	L3x3x3/8	16.01	15.10	198.5 K=1.00	2.1100	-13.22	15.33	0.862 ¹ ✓

¹ $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3 1/2x1/4 (SLV)	24.00	11.42	194.0 K=0.89	1.5600	-9.12	11.86	0.769 ¹ ✓

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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	L1 3/4x1 3/4x3/16	5.00	4.47	156.1 K=1.00	0.6211	-0.36	7.29	0.049 ¹ ✓
T2	240 - 220	L1 3/4x1 3/4x3/16	5.00	4.47	156.1 K=1.00	0.6211	-0.75	7.29	0.103 ¹ ✓
T3	220 - 200	L1 3/4x1 3/4x1/4	5.00	4.47	157.1 K=1.00	0.8125	-2.02	9.42	0.215 ¹ ✓
T4	200 - 180	L1 3/4x1 3/4x3/16	5.00	4.42	154.3 K=1.00	0.6211	-2.71	7.46	0.363 ¹ ✓

¹ $P_u / \phi P_n$ controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3x1/4	6.00	5.35	114.2 K=1.05	1.4400	-6.96	30.58	0.227 ¹ ✓

¹ $P_u / \phi P_n$ controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3x1/4	7.62	6.85	138.9 K=1.00	1.4400	-4.42	21.36	0.207 ¹ ✓

¹ $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3x3/16	12.00	12.00	241.6 K=1.00	1.0900	-0.01	5.34	0.002 ¹ ✓

¹ $P_u / \phi P_n$ controls

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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	P2.5x.203 (2.875 OD)	10.00	5.00	63.3	1.7040	3.33	76.68	0.043 ¹ ✓
T2	240 - 220	P2.5x.203 (2.875 OD)	20.00	5.00	63.3	1.7040	38.57	76.68	0.503 ¹ ✓
T3	220 - 200	P2.5x.552 (2.875 OD)	20.00	5.00	71.1	4.0285	105.77	181.28	0.583 ¹ ✓
T4	200 - 180	P3x.437 (3.50 OD)	20.03	5.01	54.9	4.2051	142.20	189.23	0.751 ¹ ✓
T5	180 - 160	4.8.1 (1.03 CR) - 79 P 4 SCH 120	20.03	5.01	41.6	5.5780	170.78	251.01	0.680 ¹ ✓
T6	160 - 140	P4x.531 (4.50 OD)	20.03	6.68	56.6	6.6210	197.15	297.95	0.662 ¹ ✓
T7	140 - 120	P5X0.5 (5.5625OD)	20.03	6.68	44.6	7.9522	222.49	357.85	0.622 ¹ ✓
T8	120 - 100	P6x.432 (6.625 OD)	20.03	6.68	36.5	8.4049	246.78	378.22	0.652 ¹ ✓
T9	100 - 80	P6x.432 (6.625 OD)	20.03	10.02	54.8	8.4049	268.38	378.22	0.710 ¹ ✓
T10	80 - 60	P8x.5 (8.625 OD)	20.03	10.02	41.8	12.7627	291.09	574.32	0.507 ¹ ✓
T11	60 - 40	P8x.5 (8.625 OD)	20.03	10.02	41.8	12.7627	313.45	574.32	0.546 ¹ ✓
T12	40 - 30	P8x.5 (8.625 OD)	10.02	10.02	41.8	12.7627	324.79	574.32	0.566 ¹ ✓
T13	30 - 20	P8x.5 (8.625 OD)	10.02	10.02	41.8	12.7627	335.30	574.32	0.584 ¹ ✓
T14	20 - 0	P8x.5 (8.625 OD)	20.03	5.01	20.9	12.7627	349.20	574.32	0.608 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	L1 3/4x1 3/4x3/16	7.07	3.22	75.2	0.3604	3.83	15.68	0.244 ¹ ✓
T2	240 - 220	L1 3/4x1 3/4x3/16	7.07	3.22	75.2	0.3604	4.60	15.68	0.293 ¹ ✓
T3	220 - 200	L1 3/4x1 3/4x1/4	7.07	3.22	76.4	0.4688	8.39	20.39	0.411 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 $\frac{P_u}{\phi P_n}$
T4	200 - 180	L1 3/4x1 3/4x3/16	7.25	3.47	80.8	0.3604	3.82	15.68	0.244 ¹ ✓
T5	180 - 160	L2x2x3/16	9.22	4.40	88.4	0.4308	4.11	18.74	0.219 ¹ ✓
T6	160 - 140	L2 1/2x2 1/2x3/16	12.58	6.12	96.6	0.5710	4.70	24.84	0.189 ¹ ✓
T7	140 - 120	L2 1/2x2 1/2x3/16	14.32	6.94	109.3	0.5710	5.15	24.84	0.207 ¹ ✓
T8	120 - 100	L3x3x3/16	16.11	7.79	101.4	0.6945	5.97	30.21	0.198 ¹ ✓
T9	100 - 80	L3x3x1/4	19.30	9.47	124.1	0.9159	6.97	39.84	0.175 ¹ ✓
T10	80 - 60	L3x3 1/2x1/4 (SLV)	21.03	10.25	136.6	1.0059	7.46	43.76	0.170 ¹ ✓
T11	60 - 40	L3 1/2x3 1/2x1/4	22.81	11.14	124.2	1.1034	8.11	48.00	0.169 ¹ ✓
T12	40 - 30	L3 1/2x4x1/4 (SLV)	23.71	11.59	131.1	1.1934	8.62	51.91	0.166 ¹ ✓
T13	30 - 20	L3 1/2x4x5/16 (SLV)	24.62	12.05	136.7	1.4824	8.85	64.49	0.137 ¹ ✓
T14	20 - 0	L3x3x3/8	15.62	14.72	199.3	1.3716	11.79	59.66	0.198 ¹ ✓

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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3 1/2x1/4 (SLV)	23.00	10.92	146.4	1.0294	8.97	44.78	0.200 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	L1 3/4x1 3/4x3/16	5.00	4.47	106.4	0.3604	0.24	15.68	0.015 ¹ ✓
T2	240 - 220	L1 3/4x1 3/4x3/16	5.00	4.47	106.4	0.3604	0.75	15.68	0.048 ¹ ✓
T3	220 - 200	L1 3/4x1 3/4x1/4	5.00	4.47	108.0	0.4688	2.02	20.39	0.099 ¹ ✓
T4	200 - 180	L1 3/4x1 3/4x3/16	5.00	4.42	105.2	0.3604	2.71	15.68	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 $\frac{P_u}{\phi P_n}$
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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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3x1/4	6.00	5.35	72.8	0.9394	6.96	40.86	0.170 ¹ ✓

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 $\frac{P_u}{\phi P_n}$
T14	20 - 0	L3x3x1/4	7.43	6.67	89.8	0.9394	4.50	40.86	0.110 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	P2.5x.203 (2.875 OD)	3	-6.61	57.19	11.6	Pass
T2	240 - 220	Leg	P2.5x.203 (2.875 OD)	21	-43.27	57.19	75.7	Pass
T3	220 - 200	Leg	P2.5x.552 (2.875 OD)	49	-116.75	125.30	93.2	Pass
T4	200 - 180	Leg	P3x.437 (3.50 OD)	79	-156.06	151.75	102.8	Acceptable
T5	180 - 160	Leg	P 4 SCH 120	109	-187.85	221.18	84.9	Pass
T6	160 - 140	Leg	P4x.531 (4.50 OD)	136	-216.86	235.73	92.0	Pass
T7	140 - 120	Leg	P5X0.5 (5.5625OD)	157	-245.58	309.50	79.3	Pass
T8	120 - 100	Leg	P6x.432 (6.625 OD)	178	-273.80	343.10	79.8	Pass
T9	100 - 80	Leg	P6x.432 (6.625 OD)	199	-299.22	303.75	98.5	Pass
T10	80 - 60	Leg	P8x.5 (8.625 OD)	214	-326.82	505.56	64.6	Pass
T11	60 - 40	Leg	P8x.5 (8.625 OD)	229	-354.48	505.56	70.1	Pass
T12	40 - 30	Leg	P8x.5 (8.625 OD)	244	-368.67	505.56	72.9	Pass
T13	30 - 20	Leg	P8x.5 (8.625 OD)	253	-381.96	505.56	75.6	Pass
T14	20 - 0	Leg	P8x.5 (8.625 OD)	262	-401.07	556.30	72.1	Pass
T1	250 - 240	Diagonal	L1 3/4x1 3/4x3/16	9	-4.04	13.16	30.7	Pass
T2	240 - 220	Diagonal	L1 3/4x1 3/4x3/16	27	-4.79	13.16	36.4	Pass
T3	220 - 200	Diagonal	L1 3/4x1 3/4x1/4	57	-8.50	17.11	49.7	Pass
T4	200 - 180	Diagonal	L1 3/4x1 3/4x3/16	87	-3.42	8.97	38.1	Pass
T5	180 - 160	Diagonal	L2x2x3/16	115	-4.09	9.49	43.1	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T6	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	144	-4.91	11.73	52.2 (b) 41.9	Pass
T7	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	165	-5.32	9.13	47.5 (b) 58.3	Pass
T8	120 - 100	Diagonal	L3x3x3/16	186	-5.79	12.68	45.6	Pass
T9	100 - 80	Diagonal	L3x3x1/4	207	-7.12	11.18	57.2 (b) 63.7	Pass
T10	80 - 60	Diagonal	L3x3 1/2x1/4 (SLV)	222	-7.82	11.76	66.5	Pass
T11	60 - 40	Diagonal	L3 1/2x3 1/2x1/4	237	-8.59	13.04	65.8	Pass
T12	40 - 30	Diagonal	L3 1/2x4x1/4 (SLV)	252	-8.31	14.43	57.6	Pass
T13	30 - 20	Diagonal	L3 1/2x4x5/16 (SLV)	261	-9.61	16.42	60.0 (b) 58.5	Pass
T14	20 - 0	Diagonal	L3x3x3/8	283	-13.22	15.33	86.2	Pass
T14	20 - 0	Horizontal	L3x3 1/2x1/4 (SLV)	279	-9.12	11.86	76.9	Pass
T1	250 - 240	Top Girt	L1 3/4x1 3/4x3/16	6	-0.36	7.29	4.9	Pass
T2	240 - 220	Top Girt	L1 3/4x1 3/4x3/16	23	-0.75	7.29	10.3	Pass
T3	220 - 200	Top Girt	L1 3/4x1 3/4x1/4	54	-2.02	9.42	21.5	Pass
T4	200 - 180	Top Girt	L1 3/4x1 3/4x3/16	84	-2.71	7.46	36.3	Pass
T14	20 - 0	Redund Horz 1 Bracing	L3x3x1/4	267	-6.96	30.58	22.7	Pass
T14	20 - 0	Redund Diag 1 Bracing	L3x3x1/4	285	-4.42	21.36	50.4 (b) 20.7	Pass
T14	20 - 0	Inner Bracing	L3x3x3/16	288	-0.01	5.34	32.6 (b) 0.3	Pass
Summary								
Leg (T4)							102.8	Acceptable
Diagonal (T14)							86.2	Pass
Horizontal (T14)							76.9	Pass
Top Girt (T4)							36.3	Pass
Redund Horz 1 Bracing (T14)							50.4	Pass
Redund Diag 1 Bracing (T14)							32.6	Pass
Inner Bracing (T14)							0.3	Pass
Bolt Checks							87.8	Pass
RATING =							102.8	Acceptable

V3.0 - 03/13/2020

Analysis complete

Note:	Long period transition (T _L) (Fig B-19):	8	C _s =	0.03
1: Get self weight & add weight (feedline) from "Mast Forces table (tnxTower Reports)"			V _s (kip) =	1.55
2: Get appurtenance weight from "Appurt. Pressure table (tnxTower Reports)"			T _s (sec) =	0.91
3: Get the guy weight from "WEIGHTAUXDATA" excel file from the tnx out put files			<i>Tnx User Forces</i>	

Section	Top Elev	Top width	Self Weight	Add Weight (feedline)	Appurtenance Weight	Guy Weight	Total Weight	$E_h(F_x)$	$*E_v$
	ft	ft	kip	kip	kip	kip	kip	kip	kip
1	250	5	0.40	0.19	4.25		4.84	0.33	0.08
2	240	5	0.78	0.52			1.30	0.05	0.02
3	220	5	1.40	0.75	4.53		6.68	0.43	0.11
4	200	5	1.35	0.81			2.16	0.08	0.04
5	180	7	1.78	0.87	0.64		3.29	0.13	0.06
6	160	9	2.12	0.90			3.02	0.10	0.05
7	140	11	2.50	0.90			3.40	0.10	0.06
8	120	13	2.89	0.90			3.79	0.09	0.06
9	100	15	2.97	0.90			3.87	0.07	0.07
10	80	17	4.12	0.90			5.02	0.08	0.08
11	60	19	4.36	0.90			5.26	0.06	0.09
12	40	21	2.29	0.45			2.74	0.01	0.05
13	30	22	2.56	0.45			3.01	0.01	0.05
14	20	23	6.06	0.90			6.96	0.02	0.12
		13.5	35.58	10.34	9.42		55.34	1.55	

Self Support Anchor Bolt Check**Project Information**SBA Project # : **FL10337-ATT-041123**Code : **H****Leg Reaction**Uplift(kips): **361** Shear (kips) : **33**Comp(kips): **416** Shear (kips) : **38****Grout**☒ 5,000 psi Grout Present☒ Use Section 15.7 exemption**Strength Reduction Factors**Tension : **0.75**Compression : **0.90**Shear : **0.75**Flexure : **0.9****Bolt Capacity :** **66.6%** *Pass***Bolt Information**Quantity : **8**Diameter (in) : **1.5**Assumed lar (in) : **1.5**Bolt Fy (ksi) : **50**Bolt Fu (AISC Table 2-6) (ksi): **65**# of threads (AISC Table 7-17) : **6**

	Pier Foundation For Self Supporting Tower		Date
			4/11/2023
	Customer Name:	AT&T	TIA Standard:
	Site Name:		Structure Height (Ft.):
	Site Number:	FL10337-A	Engineer Name:
Engr. Number:		Engineer Login ID:	A. Hagos

Foundation Info Obtained from:

Drawings/Calculations

Acceptable overstress (σ) = 5.0%

Structure Type:

Self Supporting Tower

Analysis or Design?

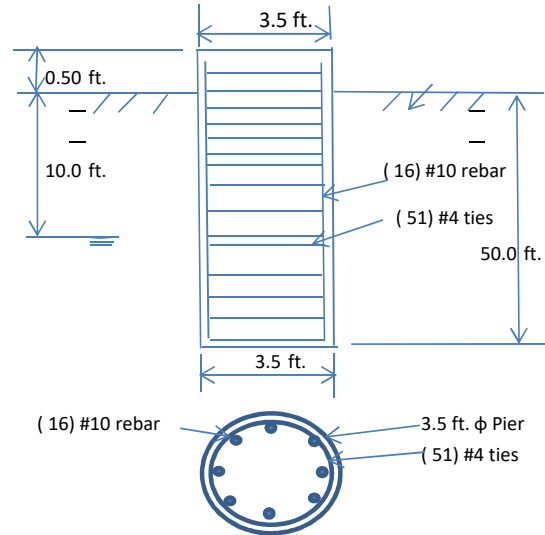
Analysis

Base Reactions (Factored):

Axial Load (Kips):	416.0	Shear Force (Kips):	38.0
Uplift Force (Kips):	361.0	Moment (Kips-ft):	0.0

Foundation Geometries:

Diameter of Pier (ft.):	3.5	Depth of Base B. G. S. :	50.0	ft.
Pier Height A. G. (ft.):	0.50			



SST Pier Foundation

Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	60	ksi
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	16	Tie Spacing:	12.0	in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0	pcf
Consider ties in concrete shear strength?	Yes			

Soil Design Parameters:

Water Table B.G.S. (ft):	10.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.00	Pullout failure Angle:	30	(°)
Skin Frictions are to be obtained from:	Soil Report			

Depth of Layers (ft)		γ_{soil}	ϕ	Cohesion	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types					
Top	Bottom	(pcf)	(°)	(psf)								
0.0	3.5	95	0	0	0		Sand					
3.5	25.0	95	29	0	600		Sand					
25.0	48.5	115	30	0	1500		Sand					
48.5	50.0	115	0	32500	10000	80000	Clay					
50.0	55.0	115										

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75
Total Dry Soil Volume from Conical Failure (cu. Ft.):	24145	Dry Soil Weight from Conical Failure:	2294 Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	27419	Buoyant Soil Weight from Conical Failure (Kips)	1705 Kips
Total Dry Concrete Volume (cu. Ft.):	101	Total Dry Concrete Weight:	15.15 Kips
Total Buoyant Concrete Volume (cu. Ft.):	385	Total Buoyant Concrete Weight:	33.71 Kips
Total Effective Concrete Weight (Kips):	48.9	Total Effective Soil Weight:	3999 Kips
Total Effective Vertical Load on Base (Kips):	435		

Check Soil Capacities:

Calculated Foundation Allowable Axial Capacity (Kips):	1098	>	Design Factored Axial Load (Kips):	435	0.40	OK!
Calculated Foundation Uplift Capacity (Kips):	565	>	Design Factored Uplift Load (Kips):	361	0.64	OK!

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

Reinforcing Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.27	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	1033	>	Design Factored Moment (Mu, K-Ft):	220.9	0.21 OK!
Calculated Shear Capacity (Kips):	99.6	>	Design Factored Shear (Kips):	38.0	0.38 OK!
Calculated Tension Capacity (Tn, Kips):	1097.3	>	Design Factored Tension (Tu Kips):	361.0	0.33 OK!
Calculated Compression Capacity (Pn, Kips):	1810	>	Design Factored Axial Load (Pu Kips):	416.0	0.23 OK!
Moment & Tension Strength Combination:	0.21	OK!	Max. Allowable Tie/Stirrup Spacing:	11.43	in.
Pier Reinforcement Ratio:	0.015	Reinforcement Ratio is satisfied per ACI			