



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

November 16, 2021

Denise Sabo
Northeast Site Solutions
4 Angela's Way
Burlington, CT 06013
denise@northeastsitesolutions.com

RE: **EM-VER-152-210924** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 41 Manitock Hill Road, Waterford, Connecticut.

Dear Ms. Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 9, 2021, submitted in response to the Council's October 29, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.
Sincerely,

A handwritten signature in black ink, appearing to read "Melanie Bachman".

Melanie Bachman
Executive Director

MAB/CW/laf

From: Deborah Chase <deborah@northeastsitesolutions.com>

Sent: Tuesday, November 9, 2021 6:27 PM

To: CSC-DL Siting Council <Siting.Council@ct.gov>; Bachman, Melanie <Melanie.Bachman@ct.gov>; Mathews, Lisa A <Lisa.A.Mathews@ct.gov>; Fontaine, Lisa <Lisa.Fontaine@ct.gov>

Cc: Denise <denise@northeastsitesolutions.com>; victoria@northeastsitesolutions.com

Subject: RE:EM-VER-152-210924- Incomplete letter- 41 Manitock Hill Road, Waterford,

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Siting Council

Please see attached signed and sealed Structural Analysis report as requested for EM-VER-142-210924.

Please let us know if this fulfils the requested requirement.

Thank you very much

Deborah Chase

Senior Project Coordinator & Analyst

Mobile: 860-490-8839



🌳 Save a tree. Refuse.Reduce. Reuse. Recycle.



MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 379-8500

Date: **May 08, 2021**

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 467304
Site Name: Waterford 2 CT

Crown Castle Designation: **BU Number:** 876338
Site Name: Waterford
JDE Job Number: 644636
Work Order Number: 1953815
Order Number: 552701 Rev. 0

Engineering Firm Designation: **Morrison Hershfield Project Number:** CN8-185 / 2101398

Site Data: **41 Manitock Hill Road, Waterford, New London County, CT 06385-2000**
Latitude 41° 21' 16.7", Longitude -72° 9' 1.6"
136 Foot - Self Support Tower

Morrison Hershfield is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity (73.6%)**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

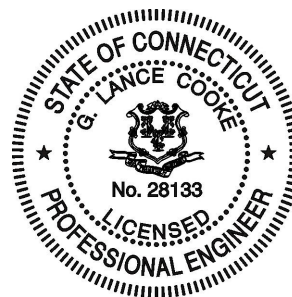


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1) INTRODUCTION

This tower is a 136 ft Self Support tower designed by PiROD Manufactures, Inc.

The tower has been modified per reinforcement drawings prepared by Vertical Structures, Inc. in January 2009. Reinforcement consists of secondary horizontal members between the elevations 90' and 95' and 1-1/4" tie-rod assemblies for tower legs from 80' to 90'.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
107.0	107.0	3	antel	BXA-80063/4CF	14	1-5/8
		6	jma wireless	MX06FRO660-03 w/ Mount Pipe		
		3	vzw	Sub6 Antenna - VZS01 w/ Mount Pipe		
		3	samsung	RFV01U-D1A		
		3	samsung	RFV01U-D2A		
		1	commscope	RC2DC-3315-PF-48		
		1	-	Sector Mount [SM 402-3]		

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)
136.0	137.0	3	alcatel lucent	TD-RRH8X20-25	4	1-1/4
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
	136.0	1	-	Platform Mount [LP 405-1]		
134.0	136.0	3	rfs celwave	IBC1900BB-1	-	-
		3	rfs celwave	IBC1900HG-2A		
	134.0	1	-	Side Arm Mount [SO 104-3]		
		3	alcatel lucent	1900MHZ RRH (65MHZ)		
		3	alcatel lucent	800MHZ 2X50W RRH W/FILTER		
127.0	127.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4
		1	-	Sector Mount [SM 411-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
117.0	119.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	9	1-5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
	3	ericsson	RADIO 4449 B12/B71			
	117.0	3	site pro 1	12' HD V-Frame [#VFA12-HD]		
97.0	97.0	1	-	Sector Mount [SM 504-3]	2 2 2 6	3/8 5/8 7/8 1-1/4
		1	cci antennas	DMP65R-BU4D w/ Mount Pipe		
		1	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU8D w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		6	powerwave technologies	LGP21401		
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
87.0	89.0	3	kathrein	800 10504 w/ Mount Pipe	6	7/8
	87.0	1	-	Sector Mount [SM 104-3]		
80.0	81.0	1	gps	GPS_A	1	1/2
	80.0	1	-	Side Arm Mount [SO 701-1]		
72.0	72.0	2	gps	GPS_A	2	1/2
		2	-	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2035622	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2068030	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1441523	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2125417	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Morrison Hershfield 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	136 - 133.625	Leg	1 1/2	2	-3.068	54.734	5.6	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.584	49.844	9.2	Pass
T3	130 - 110	Leg	2	29	-38.714	117.047	33.1	Pass
T4	110 - 94.9427	Leg	2 1/4	108	-82.276	156.330	52.6	Pass
T5	94.9427 - 92.5938	Leg	2 1/4	150	-90.868	179.339	50.7	Pass
T6	92.5938 - 90	Leg	2 1/4	162	-103.594	185.754	55.8	Pass
T7	90 - 80	Leg	PIRod 105244 w/ (2) 1-1/4" Tie Rod	175	-111.957	249.511	44.9	Pass
T8	80 - 60	Leg	PiRod 105217	184	-156.832	225.602	69.5	Pass
T9	60 - 40	Leg	PiRod 105218	199	-194.856	315.715	61.7	Pass
T10	40 - 20	Leg	PiRod 105218	214	-228.454	315.715	72.4	Pass
T11	20 - 0	Leg	PiRod 105219	229	-259.543	419.861	61.8	Pass
T1	136 - 133.625	Diagonal	3/4	7	-1.006	5.771	17.4	Pass
T2	133.625 - 130	Diagonal	3/4	25	-1.559	5.881	26.5	Pass
T3	130 - 110	Diagonal	7/8	40	-4.177	9.765	42.8	Pass
T4	110 - 94.9427	Diagonal	1	116	-5.699	14.703	38.8	Pass
T5	94.9427 - 92.5938	Diagonal	1	156	-6.059	14.412	42.0	Pass
T6	92.5938 - 90	Diagonal	1	171	-7.094	14.874	47.7	Pass
T7	90 - 80	Diagonal	L3x3x3/16	183	-8.127	25.342	32.1 73.6 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	191	-6.699	14.567	46.0 65.8 (b)	Pass
T9	60 - 40	Diagonal	L3x3x3/16	202	-6.378	20.182	31.6 54.3 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	217	-6.707	16.112	41.6 54.1 (b)	Pass
T11	20 - 0	Diagonal	L3x3x5/16	232	-9.031	20.965	43.1	Pass
T2	133.625 - 130	Horizontal	3/4	16	-0.233	3.477	6.7	Pass
T3	130 - 110	Horizontal	3/4	43	-0.732	2.875	25.4	Pass
T5	94.9427 -	Secondary	1 1/2	158	-1.574	50.442	3.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
	92.5938	Horizontal						
T6	92.5938 - 90	Secondary Horizontal	1 1/2	173	-1.794	49.847	3.6	Pass
T1	136 - 133.625	Top Girt	6x3/8	4	-0.720	5.142	14.0	Pass
T3	130 - 110	Top Girt	7/8	31	-0.732	6.540	11.2	Pass
T4	110 - 94.9427	Top Girt	1	109	-1.773	8.776	20.2	Pass
T2	133.625 - 130	Bottom Girt	7/8	19	-0.659	6.442	10.2	Pass
T3	130 - 110	Bottom Girt	7/8	34	-1.768	5.181	34.1	Pass
T6	92.5938 - 90	Bottom Girt	1	164	-1.794	7.169	25.0	Pass
							Summary	
							Leg (T10)	72.4 Pass
							Diagonal (T7)	73.6 Pass
							Horizontal (T3)	25.4 Pass
							Secondary Horizontal (T6)	3.6 Pass
							Top Girt (T4)	20.2 Pass
							Bottom Girt (T3)	34.1 Pass
							Bolt Checks	70.1 Pass
							Rating =	73.6 Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.6	Pass
1	Base Foundation (Structure)	0	21.4	Pass
1	Base Foundation (Soil Interaction)		72.4	Pass

Structure Rating (max from all components) =	73.6%*
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Notes:

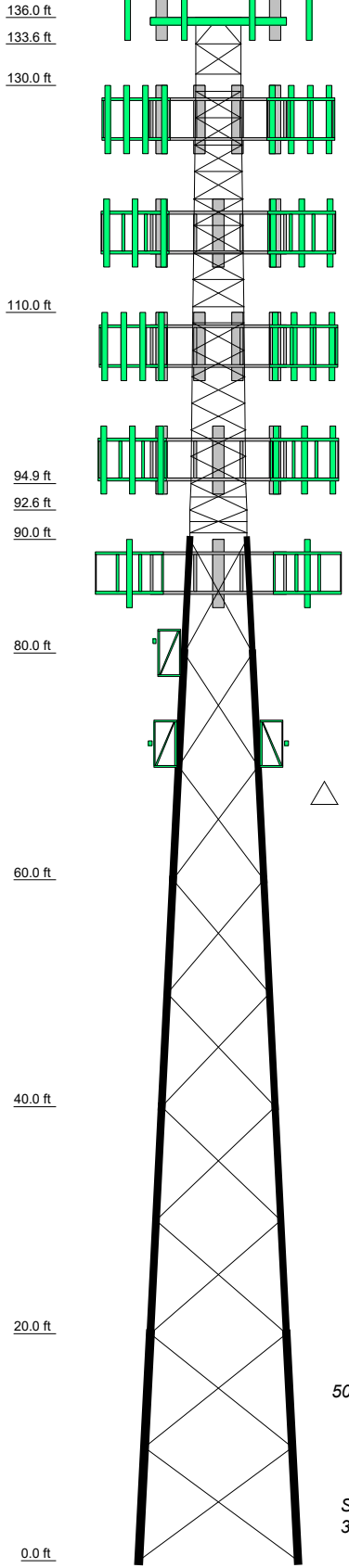
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) *Rating per TIA-222-H, Section 15.5.

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	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P1rod 105219	P1rod 105218	P1rod 105217	A572-50	A			SR 2 1/4	SR 2	SR 1 1/2	
Leg Grade	L3x3x5/16	L3x3x3/16	L3x3x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16			SR 1	SR 7/8	SR 3/4	
Diagonals											
Diagonal Grade		A36							A572-50		
Top Girts		N.A.						SR 1	SR 7/8	N.A.	B
Bottom Girts		N.A.						N.A.	SR 7/8	N.A.	N.A.
Horizontals									SR 3/4	N.A.	N.A.
Sec. Horizontals											
Face Width (ft)	14	10	8	6	4.5	4.5	4.5	4.5	4.5	4.5	4
# Panels @ (ft)	17.3	12	10	9 @ 10	6	6 @ 2.34983	6 @ 2.34983	6 @ 2.34983	6 @ 2.375	6 @ 2.375	E D
Weight (K)	17.3	4.5	2.9	2.2	1.4	0.3	0.3	0.3	1.4	0.2	0.2



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	PIRod 105244 w/ (2) 1-1/4" Tie Rod	E	1 @ 2.625
B	6x3/8	F	1 @ 2.34896
C	SR 1	G	1 @ 2.01042
D	1 @ 2.375		

MATERIAL STRENGTH

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

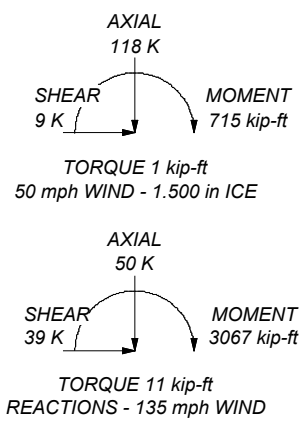
- ### TOWER DESIGN NOTES
1. Tower is located in New London County, Connecticut.
 2. Tower designed for Exposure B to the TIA-222-H Standard.
 3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
 4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice 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'
 8. TOWER RATING: 73.6%


ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 270 K
SHEAR: 27 K

UPLIFT: -238 K
SHEAR: 24 K



 Morrison Hershfield Consulting Engineers	1455 Lincoln Parkway, Suite 500 Atlanta, GA 30346 Phone: (770) 379-8500 FAX: (770) 379-8501		Job: CN8-185 / 2101398
	Project: 876338 / Waterford		
Client: Crown Castle USA	Drawn by: CKK	App'd:	
Code: TIA-222-H	Date: 05/08/21	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

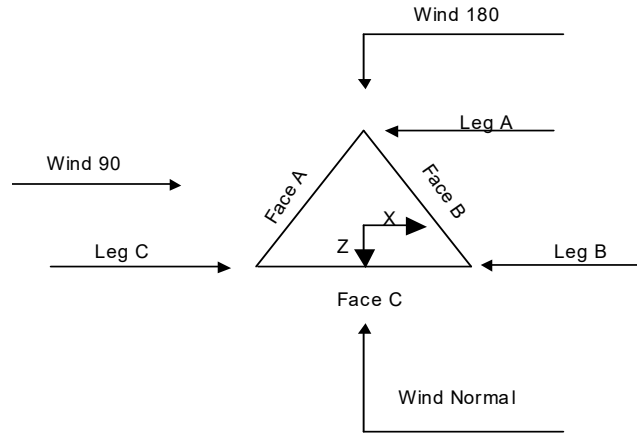
The main tower is a 3x free standing tower with an overall height of 136' above the ground line.
 The base of the tower is set at an elevation of 0' above the ground line.
 The face width of the tower is 4' at the top and 14' at the base.
 This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower is located in New London County, Connecticut.
- Tower base elevation above sea level: 242'.
- Basic wind speed of 135 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0'.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile ✓ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section ✓ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area ✓ Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules ✓ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA ✓ SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque ✓ Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	136'-133'7-1/2"			4'	1	2'4-1/2"
T2	133'7-1/2"-130'			4'	1	3'7-1/2"
T3	130'-110'			4'	1	20'
T4	110'-94'11-5/16"			4'6"	1	15'11/16"
T5	94'11-5/16"-92'7-1/8"			4'10-1/2"	1	2'4-3/16"
T6	92'7-1/8"-90'			4'11-7/32"	1	2'7-1/8"
T7	90'-80'			5'	1	10'
T8	80'-60'			6'	1	20'
T9	60'-40'			8'	1	20'
T10	40'-20'			10'	1	20'
T11	20'-0'			12'	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	136'-133'7-1/2"	2'4-1/2"	K Brace Down	No	Yes	0.000	0.000
T2	133'7-1/2"-130'	2'7-1/2"	X Brace	No	Yes	0.000	12.000
T3	130'-110'	2'4-1/2"	X Brace	No	Yes	6.000	6.000
T4	110'-94'11-5/16"	2'4-3/16"	X Brace	No	No	11.500	0.000
T5	94'11-5/16"-92'7-1/8"	2'4-3/16"	X Brace	No	Yes	0.000	0.000
T6	92'7-1/8"-90'	2'1/8"	X Brace	No	Yes	0.000	7.000
T7	90'-80'	10'	X Brace	No	No	0.000	0.000
T8	80'-60'	10'	X Brace	No	No	0.000	0.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T9	60'-40'	10'	X Brace	No	No	0.000	0.000
T10	40'-20'	10'	X Brace	No	No	0.000	0.000
T11	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136'-133'7-1/2"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 133'7-1/2"-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-94'11-5/16"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 94'11-5/16"-92'7-1/8"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 90'-80'	Truss Leg	PiRod 105244 w/ (2) 1-1/4" Tie Rod	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 80'-60'	Truss Leg	PiRod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 60'-40'	Truss Leg	PiRod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 40'-20'	Truss Leg	PiRod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 20'-0'	Truss Leg	PiRod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136'-133'7-1/2"	Flat Bar	6x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 133'7-1/2"-130'	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-94'11-5/16"	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136'-133'7-1/2"	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 133'7-1/2"-130'	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 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
T5 94'11-5/16"-92'7-1/8"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92'7-1/8"-90'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 136'-133'7-1/2"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 133'7-1/2"-130'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 130'-110'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 110'-94'11-5/16"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 94'11-5/16"-92'7-1/8"	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 92'7-1/8"-90'	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 90'-80'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 80'-60'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 60'-40'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 40'-20'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T11 20'-0'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry (cont'd)

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
				X	X	X	X	X	X	X
				Y	Y	Y	Y	Y	Y	Y

Tower Elevation ft	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
T1 136'-133'7-1/2"	No	Yes	1	1	1	1	1	1	1	1	1
T2 133'7-1/2"-130'	No	Yes	1	1	1	1	1	1	1	1	1
T3 130'-110'	No	Yes	1	1	1	1	1	1	1	1	1
T4 110'-94'11-5/16"	No	Yes	1	1	1	1	1	1	1	1	1
T5 94'11-5/16"-92'7-1/8"	No	Yes	1	1	1	1	1	1	1	0.5	1
T6 92'7-1/8"-90'	No	Yes	1	1	1	1	1	1	1	0.5	1
T7 90'-80'	Yes	No	1	1	1	1	1	1	1	1	1
T8 80'-60'	Yes	No	1	1	1	1	1	1	1	1	1
T9 60'-40'	Yes	No	1	1	1	1	1	1	1	1	1
T10 40'-20'	Yes	No	1	1	1	1	1	1	1	1	1
T11 20'-0'	Yes	No	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry (cont'd)

Tower Elevation ft	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T7 90'-80'	1.29	0.5	0.85	1	1	1
T8 80'-60'	1	0.5	0.85	1	1	1
T9 60'-40'	1	0.5	0.85	1	1	1
T10 40'-20'	1	0.5	0.85	1	1	1
T11 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136'-133'7-1/2"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	1
T2 133'7-1/2"-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	1
T3 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T4 110'-94'11-5/16"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T5 94'11-5/16"-92'7-1/8"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1

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
T6 92'7-1/8"-90'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T7 90'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T8 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T9 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T10 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1
T11 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	1	0.000	1	0.000	1

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 136'-133'7-1/2"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 133'7-1/2"-130'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 130'-110'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 110'-94'11-5/16"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 94'11-5/16"-92'7-1/8"	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 92'7-1/8"-90'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 90'-80'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 80'-60'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 60'-40'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 40'-20'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 20'-0'	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136'-133'7-1/2"	Flange	0.625	0	A325N	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
T2 133'7-1/2"-130'	Sleeve DS	0.625	5	A325N	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
T3 130'-110'	Sleeve DS	0.750	5	A325N	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
T4 110'-94'11-5/16"	Flange	0.000	0	A325N	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
T5 94'11-5/16"-92'7-1/8"	Flange	0.000	0	A325N	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
T6 92'7-1/8"-90'	Flange	1.000	6	A325N	0	0.000	0	0.000	0	0.500	0	0.000	0	0.500	0
T7 90'-80'	Flange	1.000	6	A325N	1	1.000	1	0.000	0	0.500	0	0.000	0	0.500	0
T8 80'-60'	Flange	1.000	6	A325N	1	1.000	1	0.000	0	0.500	0	0.000	0	0.500	0
T9 60'-40'	Flange	1.000	6	A325N	1	1.000	1	0.000	0	0.500	0	0.000	0	0.500	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T10 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0
T11 20'-0'	Flange	1.250 A-687	0	1.250 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	97' - 0'	-9.000	0.4	6	6	0.850 0.750	1.550		0.001
WR-VG86ST-BRDA(7/8)	C	No	No	Ar (CaAa)	97' - 0'	-5.000	-0.35	6	3	0.850 0.750	0.880		0.001
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Ar (CaAa)	136' - 0'	-5.000	-0.4	4	3	0.850 0.750	1.540		0.001
FLC 12-50J(1/2")	C	No	No	Ar (CaAa)	80' - 0'	-5.000	-0.47	1	1	0.850 0.750	0.640		0.000
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	107' - 0'	-4.000	0.37	14	7	0.850 0.750	1.980		0.001
T-Brackets*	B	No	No	Af (CaAa)	136' - 0'	-7.000	0.4	1	1	1.000	1.000		0.008
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	127' - 0'	-5.000	-0.4	6	6	0.850 0.750	1.550		0.001
LDF6-50A(1-1/4)	A	No	No	Ar (CaAa)	127' - 0'	-5.000	0.4	6	6	0.850 0.750	1.550		0.001
LDF4-50A(1/2")	A	No	No	Ar (CaAa)	72' - 0'	-9.000	0.4	2	2	0.850 0.750	0.630		0.000
T-Brackets*	A	No	No	Af (CaAa)	127' - 0'	-7.000	0.4	1	1	1.000	1.000		0.008
LDF7-50A(1-5/8")	C	No	No	Ar (CaAa)	117' - 0'	-5.000	0.4	7	7	0.850 0.750	1.980		0.001
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	117' - 0'	-5.000	-0.4	2	2	0.850 0.750	1.980		0.001
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	117' - 0'	-3.000	-0.45	1	1	0.850 0.750	1.980		0.001
T-Brackets*	C	No	No	Af (CaAa)	117' - 0'	-5.000	0.4	1	1	1.000	1.000		0.008
FXL 780 PE(7/8)	A	No	No	Ar (CaAa)	87' - 0'	0.000	0	6	6	1.000	1.090		0.000
LDF1-50A(1/4)	A	No	No	Ar (CaAa)	87' - 0'	0.000	0.1	1	1	0.345	0.345		0.000
Feedline Ladder (Af)*	A	No	No	Af (CaAa)	87' - 0'	0.000	0	1	1	3.000	3.000		0.008
Safety Line 3/8	C	No	No	Ar (CaAa)	90' - 0'	0.000	0.48	1	1	0.375	0.375		0.000
Safety Line 3/8	C	No	No	Ar (CaAa)	136' - 90'	0.000	0	1	1	0.375	0.375		0.000
Ladder Rung SR 3/4 (48"w 26"s)***	C	No	No	Af (CaAa)	136' - 90'	0.000	0	1	1	1.350	1.350		0.003

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} A _{AA} ft ² /ft	Weight klf

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} A _{AA} In Face ft ²	C _{AA} A _{AA} Out Face ft ²	Weight K
T1	136'-133'7-1/2"	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.237	0.000	0.020
		C	0.000	0.000	2.086	0.000	0.019
T2	133'7-1/2"-130'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.362	0.000	0.030
		C	0.000	0.000	3.185	0.000	0.028
T3	130'-110'	A	0.000	0.000	21.668	0.000	0.221
		B	0.000	0.000	17.810	0.000	0.229
		C	0.000	0.000	27.972	0.000	0.255
T4	110'-94'11-5/16"	A	0.000	0.000	24.453	0.000	0.218
		B	0.000	0.000	50.845	0.000	0.327
		C	0.000	0.000	36.689	0.000	0.339
T5	94'11-5/16"-92'7-1/8"	A	0.000	0.000	3.815	0.000	0.034
		B	0.000	0.000	11.115	0.000	0.064
		C	0.000	0.000	6.794	0.000	0.061
T6	92'7-1/8"-90'	A	0.000	0.000	4.212	0.000	0.038
		B	0.000	0.000	12.274	0.000	0.070
		C	0.000	0.000	7.502	0.000	0.068
T7	90'-80'	A	0.000	0.000	24.560	0.000	0.214
		B	0.000	0.000	47.320	0.000	0.271
		C	0.000	0.000	26.675	0.000	0.233
T8	80'-60'	A	0.000	0.000	57.762	0.000	0.492
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T9	60'-40'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T10	40'-20'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470
T11	20'-0'	A	0.000	0.000	58.770	0.000	0.494
		B	0.000	0.000	94.640	0.000	0.542
		C	0.000	0.000	54.630	0.000	0.470

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} A _{AA} In Face ft ²	C _{AA} A _{AA} Out Face ft ²	Weight K
T1	136'-133'7-1/2"	A	1.468	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.935	0.000	0.030
		C		0.000	0.000	5.421	0.000	0.076
T2	133'7-1/2"-130'	A	1.464	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.424	0.000	0.046
		C		0.000	0.000	8.266	0.000	0.115
T3	130'-110'	A	1.451	0.000	0.000	54.251	0.000	0.789
		B		0.000	0.000	44.019	0.000	0.695
		C		0.000	0.000	67.729	0.000	0.976
T4	110'-94'11-5/16"	A	1.428	0.000	0.000	62.120	0.000	0.853
		B		0.000	0.000	76.949	0.000	1.315
		C		0.000	0.000	84.094	0.000	1.238
T5	94'11-5/16"-92'7-1/8"	A	1.415	0.000	0.000	9.660	0.000	0.132
		B		0.000	0.000	17.628	0.000	0.282

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
T6	92'7-1/8"-90'	C		0.000	0.000	15.347	0.000	0.225
		A	1.412	0.000	0.000	10.656	0.000	0.146
		B		0.000	0.000	19.454	0.000	0.311
T7	90'-80'	C		0.000	0.000	16.931	0.000	0.248
		A	1.402	0.000	0.000	61.648	0.000	0.842
		B		0.000	0.000	74.889	0.000	1.194
T8	80'-60'	C		0.000	0.000	60.061	0.000	0.872
		A	1.375	0.000	0.000	148.944	0.000	1.963
		B		0.000	0.000	149.168	0.000	2.358
T9	60'-40'	C		0.000	0.000	126.149	0.000	1.789
		A	1.329	0.000	0.000	152.949	0.000	1.949
		B		0.000	0.000	148.143	0.000	2.308
T10	40'-20'	C		0.000	0.000	124.697	0.000	1.743
		A	1.263	0.000	0.000	150.168	0.000	1.867
		B		0.000	0.000	146.653	0.000	2.236
T11	20'-0'	C		0.000	0.000	122.585	0.000	1.678
		A	1.132	0.000	0.000	144.660	0.000	1.709
		B		0.000	0.000	143.705	0.000	2.096
		C		0.000	0.000	118.399	0.000	1.552

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
T1	136'-133'7-1/2"	2.671	1.764	2.035	1.873
T2	133'7-1/2"-130'	5.484	3.425	3.341	2.987
T3	130'-110'	-0.035	-5.377	-0.011	-2.511
T4	110'-94'11-5/16"	-1.125	-0.799	-2.039	-0.428
T5	94'11-5/16"-92'7-1/8"	1.605	1.595	0.119	1.292
T6	92'7-1/8"-90'	1.599	1.568	0.106	1.116
T7	90'-80'	0.401	0.485	-1.066	0.086
T8	80'-60'	0.415	-0.061	-1.150	-0.635
T9	60'-40'	0.625	-0.434	-1.430	-1.382
T10	40'-20'	0.819	-0.667	-1.724	-1.879
T11	20'-0'	0.986	-0.873	-1.940	-2.366

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	3	HB114-21U3M12-XXXF(1-1/4)	133.63 - 136.00	0.6000	0.3616
T1	6	T-Brackets	133.63 - 136.00	0.6000	0.3616
T1	23	Safety Line 3/8	133.63 - 136.00	0.6000	0.3616
T1	24	Ladder Rung SR 3/4 (48"w 26"s)	133.63 - 136.00	0.6000	0.3616
T2	3	HB114-21U3M12-XXXF(1-1/4)	130.00 - 133.63	0.6000	0.4840
T2	6	T-Brackets	130.00 - 133.63	0.6000	0.4840
T2	23	Safety Line 3/8	130.00 - 133.63	0.6000	0.4840
T2	24	Ladder Rung SR 3/4 (48"w 26"s)	130.00 - 133.63	0.6000	0.4840

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T3	3	HB114-21U3M12-XXXF(1-1/4)	110.00 - 130.00	0.6000	0.4344
T3	6	T-Brackets	110.00 - 130.00	0.6000	0.4344
T3	8	LDF6-50A(1-1/4)	110.00 - 127.00	0.6000	0.4344
T3	9	LDF6-50A(1-1/4)	110.00 - 127.00	0.6000	0.4344
T3	11	T-Brackets	110.00 - 127.00	0.6000	0.4344
T3	13	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	14	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	15	LDF7-50A(1-5/8")	110.00 - 117.00	0.6000	0.4344
T3	16	T-Brackets	110.00 - 117.00	0.6000	0.4344
T3	23	Safety Line 3/8	110.00 - 130.00	0.6000	0.4344
T3	24	Ladder Rung SR 3/4 (48"w 26"s)	110.00 - 130.00	0.6000	0.4344
T4	1	LDF6-50A(1-1/4)	94.94 - 97.00	0.6000	0.5497
T4	2	WR-VG86ST-BRDA(7/8)	94.94 - 97.00	0.6000	0.5497
T4	3	HB114-21U3M12-XXXF(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	5	LDF7-50A(1-5/8")	94.94 - 107.00	0.6000	0.5497
T4	6	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	8	LDF6-50A(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	9	LDF6-50A(1-1/4)	94.94 - 110.00	0.6000	0.5497
T4	11	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	13	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	14	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	15	LDF7-50A(1-5/8")	94.94 - 110.00	0.6000	0.5497
T4	16	T-Brackets	94.94 - 110.00	0.6000	0.5497
T4	23	Safety Line 3/8	94.94 - 110.00	0.6000	0.5497
T4	24	Ladder Rung SR 3/4 (48"w 26"s)	94.94 - 110.00	0.6000	0.5497
T5	1	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	2	WR-VG86ST-BRDA(7/8)	92.59 - 94.94	0.6000	0.4214
T5	3	HB114-21U3M12-XXXF(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	5	LDF7-50A(1-5/8")	92.59 - 94.94	0.6000	0.4214
T5	6	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	8	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	9	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.4214
T5	11	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	13	LDF7-50A(1-5/8")	92.59 - 94.94	0.6000	0.4214
T5	14	LDF7-50A(1-5/8")	92.59 -	0.6000	0.4214

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T5	15	LDF7-50A(1-5/8")	94.94 92.59 - 94.94	0.6000	0.4214
T5	16	T-Brackets	92.59 - 94.94	0.6000	0.4214
T5	23	Safety Line 3/8	92.59 - 94.94	0.6000	0.4214
T5	24	Ladder Rung SR 3/4 (48"w 26"s)	92.59 - 94.94	0.6000	0.4214
T6	1	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	2	WR-VG86ST-BRDA(7/8)	90.00 - 92.59	0.6000	0.3574
T6	3	HB114-21U3M12-XXXF(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	5	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	6	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	8	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	9	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.3574
T6	11	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	13	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	14	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	15	LDF7-50A(1-5/8")	90.00 - 92.59	0.6000	0.3574
T6	16	T-Brackets	90.00 - 92.59	0.6000	0.3574
T6	23	Safety Line 3/8	90.00 - 92.59	0.6000	0.3574
T6	24	Ladder Rung SR 3/4 (48"w 26"s)	90.00 - 92.59	0.6000	0.3574
T7	1	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	2	WR-VG86ST-BRDA(7/8)	80.00 - 90.00	0.6000	0.3989
T7	3	HB114-21U3M12-XXXF(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	5	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	6	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	8	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	9	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.3989
T7	11	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	13	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	14	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	15	LDF7-50A(1-5/8")	80.00 - 90.00	0.6000	0.3989
T7	16	T-Brackets	80.00 - 90.00	0.6000	0.3989
T7	18	FXL 780 PE(7/8)	80.00 - 87.00	0.6000	0.3989
T7	19	LDF1-50A(1/4)	80.00 - 87.00	0.6000	0.3989
T7	20	Feedline Ladder (Af)	80.00 - 87.00	0.6000	0.3989
T7	22	Safety Line 3/8	80.00 - 90.00	0.6000	0.3989

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	1	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	2	WR-VG86ST-BRDA(7/8)	60.00 - 80.00	0.6000	0.4754
T8	3	HB114-21U3M12-XXXF(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	4	FLC 12-50J(1/2")	60.00 - 80.00	0.6000	0.4754
T8	5	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	6	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	8	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	9	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.4754
T8	10	LDF4-50A(1/2")	60.00 - 72.00	0.6000	0.4754
T8	11	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	13	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	14	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	15	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.4754
T8	16	T-Brackets	60.00 - 80.00	0.6000	0.4754
T8	18	FXL 780 PE(7/8)	60.00 - 80.00	0.6000	0.4754
T8	19	LDF1-50A(1/4)	60.00 - 80.00	0.6000	0.4754
T8	20	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.4754
T8	22	Safety Line 3/8	60.00 - 80.00	0.6000	0.4754
T9	1	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	2	WR-VG86ST-BRDA(7/8)	40.00 - 60.00	0.6000	0.5541
T9	3	HB114-21U3M12-XXXF(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	4	FLC 12-50J(1/2")	40.00 - 60.00	0.6000	0.5541
T9	5	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	6	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	8	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	9	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5541
T9	10	LDF4-50A(1/2")	40.00 - 60.00	0.6000	0.5541
T9	11	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	13	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	14	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	15	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5541
T9	16	T-Brackets	40.00 - 60.00	0.6000	0.5541
T9	18	FXL 780 PE(7/8)	40.00 - 60.00	0.6000	0.5541
T9	19	LDF1-50A(1/4)	40.00 - 60.00	0.6000	0.5541
T9	20	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5541

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	22	Safety Line 3/8	60.00 40.00 - 60.00	0.6000	0.5541
T10	1	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	2	WR-VG86ST-BRDA(7/8)	20.00 - 40.00	0.6000	0.6000
T10	3	HB114-21U3M12-XXXF(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	4	FLC 12-50J(1/2")	20.00 - 40.00	0.6000	0.6000
T10	5	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	6	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	8	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	9	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	10	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T10	11	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	13	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	14	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	15	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	16	T-Brackets	20.00 - 40.00	0.6000	0.6000
T10	18	FXL 780 PE(7/8)	20.00 - 40.00	0.6000	0.6000
T10	19	LDF1-50A(1/4)	20.00 - 40.00	0.6000	0.6000
T10	20	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	22	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T11	1	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	2	WR-VG86ST-BRDA(7/8)	0.00 - 20.00	0.6000	0.6000
T11	3	HB114-21U3M12-XXXF(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	4	FLC 12-50J(1/2")	0.00 - 20.00	0.6000	0.6000
T11	5	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	6	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	8	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	9	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	10	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T11	11	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	13	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	14	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	15	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	16	T-Brackets	0.00 - 20.00	0.6000	0.6000
T11	18	FXL 780 PE(7/8)	0.00 - 20.00	0.6000	0.6000
T11	19	LDF1-50A(1/4)	0.00 - 20.00	0.6000	0.6000
T11	20	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	22	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.600	4.010	0.095
							1/2" Ice	5.050	4.450	0.160
							1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.090	2.860	0.077
							1/2" Ice	4.480	3.230	0.127
							1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
TD-RRH8X20-25	A	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
TD-RRH8X20-25	B	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
TD-RRH8X20-25	C	From Leg	4.000	0'0'	0.000	136'	No Ice	4.045	1.535	0.070
							1/2" Ice	4.298	1.714	0.097
							1" Ice	4.557	1.901	0.128
							2" Ice	5.098	2.295	0.201
6' x 2" Mount Pipe	A	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000	0'0'	0.000	136'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
Platform Mount [LP 405-1]	C	None			0.000	136'	No Ice	20.880	20.880	1.800
							1/2" Ice	28.890	28.890	2.277
							1" Ice	37.040	37.040	2.868
							2" Ice	53.730	53.730	4.394

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
*									
1900MHZ RRH (65MHZ)	A	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.322	2.236	0.060
						1/2" Ice	2.527	2.439	0.083
						Ice	2.739	2.648	0.109
						1" Ice	3.185	3.091	0.172
						2" Ice			
1900MHZ RRH (65MHZ)	B	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.322	2.236	0.060
						1/2" Ice	2.527	2.439	0.083
						Ice	2.739	2.648	0.109
						1" Ice	3.185	3.091	0.172
						2" Ice			
1900MHZ RRH (65MHZ)	C	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.322	2.236	0.060
						1/2" Ice	2.527	2.439	0.083
						Ice	2.739	2.648	0.109
						1" Ice	3.185	3.091	0.172
						2" Ice			
800MHZ 2X50W RRH W/FILTER	A	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.058	1.932	0.064
						1/2" Ice	2.240	2.109	0.086
						Ice	2.429	2.293	0.111
						1" Ice	2.829	2.684	0.172
						2" Ice			
800MHZ 2X50W RRH W/FILTER	B	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.058	1.932	0.064
						1/2" Ice	2.240	2.109	0.086
						Ice	2.429	2.293	0.111
						1" Ice	2.829	2.684	0.172
						2" Ice			
800MHZ 2X50W RRH W/FILTER	C	From Leg	4.000 0' 0'	0.000	134'	No Ice	2.058	1.932	0.064
						1/2" Ice	2.240	2.109	0.086
						Ice	2.429	2.293	0.111
						1" Ice	2.829	2.684	0.172
						2" Ice			
IBC1900BB-1	A	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
IBC1900BB-1	B	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
IBC1900BB-1	C	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
IBC1900HG-2A	A	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
IBC1900HG-2A	B	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
IBC1900HG-2A	C	From Leg	4.000 0' 2'	0.000	134'	No Ice	0.966	0.463	0.022
						1/2" Ice	1.091	0.558	0.030
						Ice	1.223	0.660	0.039
						1" Ice	1.510	0.893	0.065
						2" Ice			
(2) 4' x 2" Pipe Mount	A	From Leg	4.000 0' 0'	0.000	134'	No Ice	0.785	0.785	0.029
						1/2" Ice	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(2) 4' x 2" Pipe Mount	B	From Leg	4.000 0' 0'	0.000	134'	2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
(2) 4' x 2" Pipe Mount	C	From Leg	4.000 0' 0'	0.000	134'	2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
Side Arm Mount [SO 104-3]	C	None		0.000	134'	2" Ice			
						No Ice	2.620	2.620	0.288
						1/2"	3.300	3.300	0.408
						Ice	3.980	3.980	0.528
						1" Ice	5.350	5.350	0.768
* (4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	127'	2" Ice			
						No Ice	2.240	3.340	0.043
						1/2"	2.610	3.730	0.079
						Ice	2.990	4.130	0.122
						1" Ice	3.780	4.970	0.232
HSS 4"x4"x4'	A	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	A	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	B	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	B	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	C	From Face	0.500 0' 1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
HSS 4"x4"x4'	C	From Face	0.500 0' -1'	0.000	127'	2" Ice			
						No Ice	2.089	0.000	0.040
						1/2"	2.388	0.000	0.055
						Ice	2.695	0.000	0.073
						1" Ice	3.331	0.000	0.123
Sector Mount [SM 411-3]	C	None		0.000	127'	2" Ice			
						No Ice	20.530	20.530	1.069
						1/2"	28.620	28.620	1.457
						Ice	36.630	36.630	1.972

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						1" Ice	52.730	52.730	3.369
						2" Ice			
* ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
KRY 112 144/1	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
RADIO 4449 B12/B71	A	From Leg	4.000 0'	0.000	117'	No Ice 1/2"	1.650 1.810	1.163 1.301	0.074 0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
RADIO 4449 B12/B71	B	From Leg	4.000	0.000	117'	No Ice 1.650	1.163	0.074
			0'			1/2" 1.810	1.301	0.090
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
RADIO 4449 B12/B71	C	From Leg	4.000	0.000	117'	No Ice 1.650	1.163	0.074
			0'			1/2" 1.810	1.301	0.090
			2'			Ice 1.978	1.447	0.109
						1" Ice 2.336	1.762	0.155
						2" Ice		
(3) 12' HD V-Frame [#VFA12-HD]	C	None		0.000	117'	No Ice 29.820	29.820	1.673
						1/2" 42.210	42.210	2.266
						Ice 54.430	54.430	3.052
						1" Ice 78.490	78.490	5.180
						2" Ice		
*								
BXA-80063/4CF	A	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
BXA-80063/4CF	B	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
BXA-80063/4CF	C	From Leg	4.000	0.000	107'	No Ice 4.840	2.590	0.010
			0'			1/2" 5.370	3.070	0.038
			0'			Ice 5.920	3.580	0.070
						1" Ice 7.080	4.640	0.148
						2" Ice		
RC2DC-3315-PF-48	A	From Leg	4.000	0.000	107'	No Ice 3.792	2.512	0.032
			0'			1/2" 4.044	2.725	0.063
			0'			Ice 4.303	2.945	0.099
						1" Ice 4.844	3.414	0.181
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	A	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	B	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
(2) MX06FRO660-03 w/ Mount Pipe	C	From Leg	4.000	0.000	107'	No Ice 6.540	5.550	0.103
			0'			1/2" 7.060	6.050	0.185
			0'			Ice 7.600	6.570	0.277
						1" Ice 8.700	7.650	0.496
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101
			0'			1/2" 5.264	3.151	0.141
			0'			Ice 5.623	3.631	0.186
						1" Ice 6.371	4.639	0.294
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101
			0'			1/2" 5.264	3.151	0.141
			0'			Ice 5.623	3.631	0.186
						1" Ice 6.371	4.639	0.294
						2" Ice		
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Leg	4.000	0.000	107'	No Ice 4.915	2.687	0.101

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Mount Pipe			0' 0'			1/2" Ice 1" Ice 2" Ice	5.264 5.623 6.371	3.151 3.631 4.639	0.141 0.186 0.294
RFV01U-D1A	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D2A	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
Sector Mount [SM 402-3]	C	None		0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice	18.870 26.470 33.990 48.840	18.870 26.470 33.990 48.840	0.851 1.210 1.696 3.044
*									
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	15.890 16.810 17.760 19.700	7.890 8.740 9.600 11.370	0.139 0.252 0.380 0.679
DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	7.530 8.040 8.570 9.680	3.790 4.230 4.680 5.630	0.095 0.156 0.225 0.391
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	11.960 12.700 13.460 15.020	5.970 6.630 7.300 8.690	0.115 0.201 0.298 0.529
OPA65R-BU8D w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	17.460 18.460 19.480 21.580	8.580 9.490 10.420 12.330	0.109 0.224 0.353 0.656
OPA65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice 1/2" Ice 1" Ice 2" Ice	8.100 8.650 9.210 10.390	4.030 4.500 4.980 5.980	0.081 0.142 0.212 0.380

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	12.250	6.050	0.089
						1/2" Ice	13.000	6.710	0.176
						Ice	13.760	7.390	0.275
						1" Ice	15.340	8.790	0.508
						2" Ice			
7770.00 w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						Ice	2.328	1.727	0.111
						1" Ice	2.718	2.075	0.163
						2" Ice			
RRUS 4478 B14_CCIV2	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 4478 B14_CCIV2	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 4478 B14_CCIV2	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
						1" Ice	2.780	1.891	0.147
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.000 0' 0'	0.000	97'	No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
						1" Ice	2.733	2.405	0.176
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(2) LGP21401	A	From Leg	4.000	0'0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
(2) LGP21401	B	From Leg	4.000	0'0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
(2) LGP21401	C	From Leg	4.000	0'0'	0.000	97'	No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
							2" Ice	1.688	0.521	0.055
DC9-48-60-24-8C-EV	A	From Leg	4.000	0'0'	0.000	97'	No Ice	2.737	4.785	0.026
							1/2" Ice	2.963	5.065	0.063
							1" Ice	3.196	5.352	0.104
							2" Ice	3.684	5.948	0.200
DC6-48-60-18-8F	B	From Leg	4.000	0'0'	0.000	97'	No Ice	0.917	0.917	0.019
							1/2" Ice	1.458	1.458	0.037
							1" Ice	1.643	1.643	0.057
							2" Ice	2.042	2.042	0.105
8' x 2" Mount Pipe	A	From Leg	4.000	0'0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0'0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0'0'	0.000	97'	No Ice	1.900	1.900	0.029
							1/2" Ice	2.728	2.728	0.044
							1" Ice	3.401	3.401	0.063
							2" Ice	4.396	4.396	0.119
Sector Mount [SM 504-3]	C	None			0.000	97'	No Ice	31.050	31.050	1.708
							1/2" Ice	43.830	43.830	2.326
							1" Ice	56.440	56.440	3.143
							2" Ice	81.280	81.280	5.358
* 800 10504 w/ Mount Pipe	A	From Leg	4.000	0'2'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	B	From Leg	4.000	0'2'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	C	From Leg	4.000	0'2'	0.000	87'	No Ice	2.690	2.260	0.038
							1/2" Ice	3.120	2.680	0.067
							1" Ice	3.560	3.120	0.105
							2" Ice	4.490	4.030	0.206
6' x 2" Mount Pipe	A	From Leg	4.000	0'0'	0.000	87'	No Ice	1.425	1.425	0.022
							1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090

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
6' x 2" Mount Pipe	B	From Leg	4.000 0' 0'	0.000	87'	2" Ice			
						No Ice	1.425	1.425	0.022
						1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0' 0'	0.000	87'	2" Ice			
						No Ice	1.425	1.425	0.022
						1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
Sector Mount [SM 104-3]	C	None		0.000	87'	2" Ice			
						No Ice	30.210	30.210	0.953
						1/2"	38.120	38.120	1.432
						Ice	46.010	46.010	2.031
						1" Ice	62.030	62.030	3.577
* GPS_A	C	From Leg	3.000 0' 1'	0.000	80'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0' 0'	0.000	80'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
* GPS_A	B	From Leg	3.000 0' 0'	0.000	72'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
GPS_A	C	From Leg	3.000 0' 0'	0.000	72'	2" Ice			
						No Ice	0.255	0.255	0.001
						1/2"	0.320	0.320	0.005
						Ice	0.393	0.393	0.010
						1" Ice	0.561	0.561	0.025
Side Arm Mount [SO 701-1]	B	From Leg	1.500 0' 0'	0.000	72'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0' 0'	0.000	72'	2" Ice			
						No Ice	0.850	1.670	0.065
						1/2"	1.140	2.340	0.079
						Ice	1.430	3.010	0.093
						1" Ice	2.010	4.350	0.121
*									

Truss-Leg Properties

Section Designation	Area in ²	Area Ice in ²	Self Weight K	Ice Weight K	Equiv. Diameter r in	Equiv. Diameter r Ice in	Leg Area in ²
PiRod 105244 w/ (2) 1-1/4" Tie Rod	1076.466	2615.068	0.726	0.497	7.475	18.160	6.138

Section Designation	Area <i>in</i> ²	Area Ice <i>in</i> ²	Self Weight K	Ice Weight K	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in</i> ²
Pirod 105217	2296.236	5959.026	0.587	0.669	7.973	20.691	5.301
Pirod 105218	2425.314	5998.674	0.722	0.653	8.421	20.829	7.216
Pirod 105218	2425.314	5951.592	0.722	0.603	8.421	20.665	7.216
Pirod 105219	2597.910	5930.127	1.086	0.557	9.021	20.591	9.425

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	136 - 133.625	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	31	-3.068	-0.034	-0.019
			Max. Mx	8	-1.776	-0.166	-0.003
		Diagonal	Max. My	2	-1.793	0.005	0.169
			Max. Vy	8	0.277	-0.166	-0.003
			Max. Vx	3	-0.280	0.003	0.164
			Max Tension	9	0.938	0.000	0.000
			Max. Compression	8	-1.006	0.000	0.000
			Max. Mx	26	-0.081	0.005	0.000
		Top Girt	Max. Vy	26	0.006	0.000	0.000
			Max Tension	7	0.720	0.000	0.000
			Max. Compression	18	-0.720	-0.053	0.000
			Max. Mx	33	-0.081	-0.078	0.000
			Max. My	3	0.363	0.014	-0.000
			Max. Vy	33	0.062	-0.078	0.000
T2	133.625 - 130	Leg	Max Tension	15	3.302	0.008	0.501
			Max. Compression	10	-6.135	-0.479	-0.276
			Max. Mx	8	-5.508	-0.538	-0.016
		Diagonal	Max. My	2	-6.060	0.010	0.555
			Max. Vy	8	1.037	-0.538	-0.016
			Max. Vx	2	-1.065	0.010	0.555
			Max Tension	25	1.437	0.000	0.000
			Max. Compression	24	-1.559	0.000	0.000
			Max. Mx	33	0.167	-0.004	-0.000
		Horizontal	Max. My	20	1.405	-0.001	-0.000
			Max. Vy	33	0.007	-0.004	-0.000
			Max. Vx	20	0.000	-0.001	-0.000
			Max Tension	2	0.377	0.000	0.000
			Max. Compression	15	-0.233	0.000	0.000
			Max. Mx	26	0.164	0.012	0.000
Bottom Girt	Max. Vy	26	0.012	0.000	0.000		
	Max Tension	14	0.753	0.000	0.000		
	Max. Compression	3	-0.659	0.000	0.000		
	Max. Mx	26	0.125	0.014	0.000		
	Max. Vy	26	0.014	0.000	0.000		
	Max. Vx	20	2.644	0.001	0.243		
T3	130 - 110	Leg	Max Tension	15	34.312	1.706	-0.010
			Max. Compression	10	-42.237	-0.243	-0.005
			Max. Mx	2	-42.187	-1.714	0.010
		Diagonal	Max. My	20	-4.394	-0.001	1.564
			Max. Vy	2	-2.943	-0.243	0.002
			Max. Vx	20	2.644	0.001	0.243
			Max Tension	25	4.025	0.000	0.000
			Max. Compression	24	-4.177	0.000	0.000
			Max. Mx	38	0.818	-0.005	-0.000
		Horizontal	Max. My	24	-4.160	-0.001	0.000
			Max. Vy	38	0.010	-0.005	-0.000
			Max. Vx	24	-0.000	-0.001	0.000
			Max Tension	14	0.606	0.000	0.000
			Max. Compression	3	-0.423	0.000	0.000
			Max. Mx	26	0.290	0.014	0.000
Top Girt	Max. Vy	26	-0.013	0.000	0.000		
	Max Tension	2	0.676	0.000	0.000		
	Max. Compression	15	-0.638	0.000	0.000		
	Max. Mx	26	0.033	0.013	0.000		
	Max. Vy	26	-0.013	0.000	0.000		
	Max Tension	14	1.898	0.000	0.000		
Bottom Girt	Max. Compression	3	-1.768	0.000	0.000		
	Max. Mx	26	0.180	0.017	0.000		
	Max. Vy	26	-0.015	0.000	0.000		
	Max Tension	7	70.004	-0.203	0.014		
	Max. Compression	2	-82.276	0.015	0.006		
	Max. Mx	2	-45.730	2.583	-0.014		
T4	110 - 94.9427	Leg	Max. My	20	-4.448	0.007	-2.294
			Max. Vy	2	-2.951	2.583	-0.014
			Max. Vx	20	2.651	0.007	-2.294

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T5	94.9427 - 92.5938	Diagonal	Max Tension	17	5.669	0.000	0.000	
			Max. Compression	4	-5.699	0.000	0.000	
			Max. Mx	27	1.050	-0.008	-0.000	
			Max. My	12	-4.636	-0.001	-0.001	
			Max. Vy	27	0.012	-0.008	-0.000	
		Top Girt	Max. Vx	12	0.001	0.000	0.000	
			Max Tension	2	1.817	0.000	0.000	
			Max. Compression	15	-1.773	0.000	0.000	
			Max. Mx	26	0.051	0.019	0.000	
			Max. Vy	26	-0.017	0.000	0.000	
		Leg	Max Tension	7	77.477	-0.034	0.015	
			Max. Compression	2	-90.868	-0.242	-0.000	
			Max. Mx	2	-90.856	0.308	-0.001	
			Max. My	8	-7.711	-0.011	0.238	
			Max. Vy	18	0.469	0.308	0.002	
			Max. Vx	8	0.248	-0.011	0.238	
			Diagonal	Max Tension	17	5.962	-0.004	0.000
				Max. Compression	16	-6.059	0.000	0.000
				Max. Mx	27	1.126	-0.008	0.000
				Max. My	18	4.590	-0.008	0.001
Max. Vy	27			0.012	-0.008	0.000		
Secondary Horizontal	Max. Vx		18	-0.001	0.000	0.000		
	Max Tension		6	0.597	0.000	0.000		
	Max. Compression		19	-0.498	-0.001	-0.001		
	Max. Mx		36	0.230	-0.010	-0.000		
	Max. My	4	-0.475	-0.004	-0.001			
	Max. Vy	36	-0.019	-0.010	-0.000			
	Max. Vx	16	0.001	0.000	0.000			
	Leg	Max Tension	7	89.801	1.226	-0.040		
		Max. Compression	2	-103.594	3.193	0.024		
		Max. Mx	18	-103.570	3.236	-0.066		
Max. My		8	-8.057	0.048	1.453			
Max. Vy		18	-7.640	3.236	-0.066			
Max. Vx		8	-3.380	0.048	1.453			
Diagonal		Max Tension	17	6.944	-0.004	0.000		
		Max. Compression	16	-7.094	0.000	0.000		
		Max. Mx	27	0.961	-0.008	0.000		
		Max. My	8	-3.562	-0.003	-0.001		
	Max. Vy	27	0.012	-0.008	0.000			
Secondary Horizontal	Max. Vx	8	-0.001	0.000	0.000			
	Max Tension	16	1.465	0.000	0.000			
	Max. Compression	17	-1.383	0.000	0.000			
	Max. Mx	31	-0.134	-0.012	-0.001			
	Max. My	4	-1.370	-0.008	-0.001			
	Max. Vy	31	0.021	-0.012	-0.001			
	Max. Vx	4	0.000	0.000	0.000			
	Bottom Girt	Max Tension	14	0.829	0.000	0.000		
		Max. Compression	3	-0.770	0.000	0.000		
		Max. Mx	26	0.071	0.023	0.000		
Max. Vy		26	-0.019	0.000	0.000			
Max Tension		7	97.809	-3.160	0.066			
Leg	Max. Compression	18	-111.957	3.423	0.011			
	Max. Mx	6	95.222	-4.078	-0.017			
	Max. My	4	-8.427	-0.339	-6.916			
	Max. Vy	22	0.335	-4.048	-0.014			
	Max. Vx	4	0.823	-0.339	-6.916			
	Diagonal	Max Tension	7	7.476	0.108	0.026		
		Max. Compression	18	-8.127	0.000	0.000		
		Max. Mx	6	6.867	0.109	-0.020		
		Max. My	10	-7.944	-0.065	0.033		
		Max. Vy	28	-0.027	0.048	0.001		
	Leg	Max. Vx	10	-0.007	0.000	0.000		
		Max Tension	7	138.350	-6.021	0.010		
		Max. Compression	18	-156.832	5.997	0.011		
		Max. Mx	18	-156.488	6.173	-0.023		
		Max. My	4	-9.511	-0.339	-6.916		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
T9	60 - 40	Diagonal	Max. Vy	2	-0.397	6.132	0.019			
			Max. Vx	24	0.279	-0.347	6.801			
			Max Tension	16	7.018	0.066	0.005			
			Max. Compression	5	-6.845	0.000	0.000			
			Max. Mx	18	6.356	0.088	-0.004			
			Max. My	30	1.268	0.058	0.008			
		Leg	Max. Vy	27	-0.032	0.061	0.008			
			Max. Vx	30	-0.002	0.000	0.000			
			Max Tension	7	172.842	-5.739	-0.004			
			Max. Compression	18	-194.856	5.711	-0.004			
			Max. Mx	6	153.813	-6.025	-0.027			
			Max. My	16	-11.503	-0.018	5.815			
			Max. Vy	22	-0.144	-5.850	-0.041			
			Max. Vx	16	0.202	-0.018	5.815			
Diagonal	Max Tension	4	6.343	0.000	0.000					
	Max. Compression	18	-6.378	0.000	0.000					
	Max. Mx	18	5.647	0.106	0.007					
	Max. My	32	-0.971	0.037	-0.010					
	Max. Vy	29	0.044	0.069	-0.009					
	Max. Vx	32	0.003	0.000	0.000					
T10	40 - 20	Leg	Max Tension	7	202.894	-5.083	0.010			
			Max. Compression	18	-228.454	7.196	0.104			
			Max. Mx	18	-228.454	7.196	0.104			
			Max. My	16	-14.156	-0.190	6.148			
			Max. Vy	37	0.410	-3.893	-0.012			
			Max. Vx	16	0.293	-0.190	6.148			
		Diagonal	Max Tension	7	6.326	0.000	0.000			
			Max. Compression	18	-6.707	0.000	0.000			
			Max. Mx	18	5.010	0.099	0.008			
			Max. My	38	1.701	0.078	0.012			
			Max. Vy	29	0.050	0.080	0.011			
			Max. Vx	38	-0.003	0.000	0.000			
			T11	20 - 0	Leg	Max Tension	7	229.581	-5.352	0.008
						Max. Compression	18	-259.543	0.000	0.000
Max. Mx	18	-245.195				7.196	0.104			
Max. My	16	-16.148				-0.461	9.383			
Max. Vy	37	-0.716				-3.893	-0.012			
Max. Vx	16	1.076				-0.461	9.383			
Diagonal	Max Tension	7			8.330	0.000	0.000			
	Max. Compression	18			-9.031	0.000	0.000			
			Max. Mx	18	5.615	0.139	-0.017			
			Max. My	16	6.798	0.118	0.023			
			Max. Vy	29	0.064	0.126	-0.014			
			Max. Vx	28	0.004	0.000	0.000			

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	269.553	23.496	-13.134
	Max. H _x	18	269.553	23.496	-13.134
	Max. H _z	7	-237.922	-20.982	11.701
	Min. Vert	7	-237.922	-20.982	11.701
	Min. H _x	7	-237.922	-20.982	11.701
	Min. H _z	18	269.553	23.496	-13.134
Leg B	Max. Vert	10	258.152	-21.955	-12.795
	Max. H _x	23	-225.517	19.426	11.337
	Max. H _z	23	-225.517	19.426	11.337
	Min. Vert	23	-225.517	19.426	11.337
	Min. H _x	10	258.152	-21.955	-12.795
	Min. H _z	10	258.152	-21.955	-12.795
Leg A	Max. Vert	2	261.326	0.023	25.795
	Max. H _x	20	16.082	0.591	1.375
	Max. H _z	2	261.326	0.023	25.795

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	15	-229.811	-0.009	-22.903
	Min. H _x	9	12.602	-0.577	1.077
	Min. H _z	15	-229.811	-0.009	-22.903

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	41.566	0.000	0.000	2.379	-3.345	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	49.879	0.037	-37.217	-2966.827	-7.755	0.320
0.9 Dead+1.0 Wind 0 deg - No Ice	37.410	0.037	-37.217	-2967.541	-6.752	0.320
1.2 Dead+1.0 Wind 30 deg - No Ice	49.879	18.908	-32.875	-2613.510	-1507.824	11.205
0.9 Dead+1.0 Wind 30 deg - No Ice	37.410	18.908	-32.875	-2614.224	-1506.820	11.205
1.2 Dead+1.0 Wind 60 deg - No Ice	49.879	33.147	-19.253	-1522.600	-2627.007	8.779
0.9 Dead+1.0 Wind 60 deg - No Ice	37.410	33.147	-19.253	-1523.314	-2626.004	8.779
1.2 Dead+1.0 Wind 90 deg - No Ice	49.879	37.533	-0.037	-0.886	-2983.984	-3.163
0.9 Dead+1.0 Wind 90 deg - No Ice	37.410	37.533	-0.037	-1.600	-2982.980	-3.163
1.2 Dead+1.0 Wind 120 deg - No Ice	49.879	31.664	18.354	1469.634	-2532.860	-2.568
0.9 Dead+1.0 Wind 120 deg - No Ice	37.410	31.664	18.354	1468.920	-2531.856	-2.568
1.2 Dead+1.0 Wind 150 deg - No Ice	49.879	17.674	30.813	2498.053	-1433.549	5.001
0.9 Dead+1.0 Wind 150 deg - No Ice	37.410	17.674	30.813	2497.340	-1432.545	5.001
1.2 Dead+1.0 Wind 180 deg - No Ice	49.879	-0.037	36.465	2938.217	-0.273	-0.320
0.9 Dead+1.0 Wind 180 deg - No Ice	37.410	-0.037	36.465	2937.504	0.730	-0.320
1.2 Dead+1.0 Wind 210 deg - No Ice	49.879	-18.908	32.875	2619.220	1499.796	-11.205
0.9 Dead+1.0 Wind 210 deg - No Ice	37.410	-18.908	32.875	2618.506	1500.799	-11.205
1.2 Dead+1.0 Wind 240 deg - No Ice	49.879	-33.798	19.629	1545.469	2648.700	-8.779
0.9 Dead+1.0 Wind 240 deg - No Ice	37.410	-33.798	19.629	1544.756	2649.704	-8.779
1.2 Dead+1.0 Wind 270 deg - No Ice	49.879	-37.533	0.037	6.596	2975.955	3.163
0.9 Dead+1.0 Wind 270 deg - No Ice	37.410	-37.533	0.037	5.882	2976.959	3.163
1.2 Dead+1.0 Wind 300 deg - No Ice	49.879	-31.013	-17.979	-1446.765	2495.110	2.568
0.9 Dead+1.0 Wind 300 deg - No Ice	37.410	-31.013	-17.979	-1447.478	2496.114	2.568
1.2 Dead+1.0 Wind 330 deg - No Ice	49.879	-17.674	-30.813	-2492.344	1425.520	-5.001
0.9 Dead+1.0 Wind 330 deg - No Ice	37.410	-17.674	-30.813	-2493.058	1426.524	-5.001
1.2 Dead+1.0 Ice+1.0 Temp	118.296	0.000	0.000	5.519	-12.641	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	118.296	0.003	-8.759	-691.802	-13.011	-0.739
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	118.296	4.425	-7.690	-604.468	-363.576	1.331
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	118.296	7.745	-4.490	-349.050	-623.883	1.073

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	118.296	8.902	-0.003	5.149	-715.042	-0.846
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	118.296	7.607	4.406	354.530	-614.997	-0.566
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	118.296	4.302	7.482	603.509	-356.223	1.238
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	118.296	-0.003	8.680	699.248	-12.271	0.739
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	118.296	-4.425	7.690	615.506	338.295	-1.331
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	118.296	-7.814	4.530	361.883	601.712	-1.073
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	118.296	-8.902	0.003	5.889	689.761	0.846
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	118.296	-7.538	-4.366	-341.696	586.605	0.566
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	118.296	-4.302	-7.482	-592.471	330.942	-1.238
Dead+Wind 0 deg - Service	41.566	0.008	-7.739	-615.188	-4.123	0.072
Dead+Wind 30 deg - Service	41.566	3.932	-6.836	-541.712	-316.073	2.336
Dead+Wind 60 deg - Service	41.566	6.893	-4.004	-314.849	-548.814	1.831
Dead+Wind 90 deg - Service	41.566	7.805	-0.008	1.601	-623.051	-0.655
Dead+Wind 120 deg - Service	41.566	6.585	3.817	307.407	-529.238	-0.534
Dead+Wind 150 deg - Service	41.566	3.675	6.408	521.276	-300.629	1.037
Dead+Wind 180 deg - Service	41.566	-0.008	7.583	612.810	-2.567	-0.072
Dead+Wind 210 deg - Service	41.566	-3.932	6.836	546.470	309.382	-2.336
Dead+Wind 240 deg - Service	41.566	-7.028	4.082	323.175	548.304	-1.831
Dead+Wind 270 deg - Service	41.566	-7.805	0.008	3.157	616.361	0.655
Dead+Wind 300 deg - Service	41.566	-6.449	-3.739	-299.081	516.368	0.534
Dead+Wind 330 deg - Service	41.566	-3.675	-6.408	-516.518	293.939	-1.037

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	-41.566	0.000	0.000	41.566	0.000	0.000%
2	0.037	-49.879	-37.217	-0.037	49.879	37.217	0.000%
3	0.037	-37.410	-37.217	-0.037	37.410	37.217	0.000%
4	18.908	-49.879	-32.875	-18.908	49.879	32.875	0.000%
5	18.908	-37.410	-32.875	-18.908	37.410	32.875	0.000%
6	33.147	-49.879	-19.253	-33.147	49.879	19.253	0.000%
7	33.147	-37.410	-19.253	-33.147	37.410	19.253	0.000%
8	37.533	-49.879	-0.037	-37.533	49.879	0.037	0.000%
9	37.533	-37.410	-0.037	-37.533	37.410	0.037	0.000%
10	31.664	-49.879	18.354	-31.664	49.879	-18.354	0.000%
11	31.664	-37.410	18.354	-31.664	37.410	-18.354	0.000%
12	17.674	-49.879	30.813	-17.674	49.879	-30.813	0.000%
13	17.674	-37.410	30.813	-17.674	37.410	-30.813	0.000%
14	-0.037	-49.879	36.465	0.037	49.879	-36.465	0.000%
15	-0.037	-37.410	36.465	0.037	37.410	-36.465	0.000%
16	-18.908	-49.879	32.875	18.908	49.879	-32.875	0.000%
17	-18.908	-37.410	32.875	18.908	37.410	-32.875	0.000%
18	-33.798	-49.879	19.629	33.798	49.879	-19.629	0.000%
19	-33.798	-37.410	19.629	33.798	37.410	-19.629	0.000%
20	-37.533	-49.879	0.037	37.533	49.879	-0.037	0.000%
21	-37.533	-37.410	0.037	37.533	37.410	-0.037	0.000%
22	-31.013	-49.879	-17.979	31.013	49.879	17.979	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
23	-31.013	-37.410	-17.979	31.013	37.410	17.979	0.000%
24	-17.674	-49.879	-30.813	17.674	49.879	30.813	0.000%
25	-17.674	-37.410	-30.813	17.674	37.410	30.813	0.000%
26	0.000	-118.296	0.000	0.000	118.296	0.000	0.000%
27	0.003	-118.296	-8.759	-0.003	118.296	8.759	0.000%
28	4.425	-118.296	-7.690	-4.425	118.296	7.690	0.000%
29	7.745	-118.296	-4.490	-7.745	118.296	4.490	0.000%
30	8.902	-118.296	-0.003	-8.902	118.296	0.003	0.000%
31	7.607	-118.296	4.406	-7.607	118.296	-4.406	0.000%
32	4.302	-118.296	7.482	-4.302	118.296	-7.482	0.000%
33	-0.003	-118.296	8.680	0.003	118.296	-8.680	0.000%
34	-4.425	-118.296	7.690	4.425	118.296	-7.690	0.000%
35	-7.814	-118.296	4.530	7.814	118.296	-4.530	0.000%
36	-8.902	-118.296	0.003	8.902	118.296	-0.003	0.000%
37	-7.538	-118.296	-4.366	7.538	118.296	4.366	0.000%
38	-4.302	-118.296	-7.482	4.302	118.296	7.482	0.000%
39	0.008	-41.566	-7.739	-0.008	41.566	7.739	0.000%
40	3.932	-41.566	-6.836	-3.932	41.566	6.836	0.000%
41	6.893	-41.566	-4.004	-6.893	41.566	4.004	0.000%
42	7.805	-41.566	-0.008	-7.805	41.566	0.008	0.000%
43	6.585	-41.566	3.817	-6.585	41.566	-3.817	0.000%
44	3.675	-41.566	6.408	-3.675	41.566	-6.408	0.000%
45	-0.008	-41.566	7.583	0.008	41.566	-7.583	0.000%
46	-3.932	-41.566	6.836	3.932	41.566	-6.836	0.000%
47	-7.028	-41.566	4.082	7.028	41.566	-4.082	0.000%
48	-7.805	-41.566	0.008	7.805	41.566	-0.008	0.000%
49	-6.449	-41.566	-3.739	6.449	41.566	3.739	0.000%
50	-3.675	-41.566	-6.408	3.675	41.566	6.408	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 133.625	3.756	41	0.240	0.018
T2	133.625 - 130	3.636	41	0.239	0.018
T3	130 - 110	3.431	41	0.238	0.019
T4	110 - 94.9427	2.429	47	0.219	0.017
T5	94.9427 - 92.5938	1.741	47	0.188	0.013
T6	92.5938 - 90	1.647	47	0.181	0.012
T7	90 - 80	1.544	47	0.172	0.010
T8	80 - 60	1.190	47	0.151	0.007
T9	60 - 40	0.638	47	0.100	0.006
T10	40 - 20	0.276	47	0.063	0.004
T11	20 - 0	0.067	47	0.027	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSP18-C-A20 w/ Mount Pipe	41	3.756	0.240	0.018	26788
134'	1900MHZ RRH (65MHZ)	41	3.656	0.239	0.018	26788
127'	(4) DB844H90E-XY w/ Mount Pipe	41	3.264	0.237	0.019	13377
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	47	2.760	0.228	0.019	40290
107'	BXA-80063/4CF	47	2.286	0.215	0.016	152967
97'	DMP65R-BU8D w/ Mount Pipe	47	1.827	0.194	0.013	15225

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87'	800 10504 w/ Mount Pipe	47	1.431	0.165	0.009	18100
80'	GPS_A	47	1.190	0.151	0.007	22871
72'	GPS_A	47	0.945	0.132	0.007	23919

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 133.625	18.105	19	1.151	0.088
T2	133.625 - 130	17.529	19	1.151	0.088
T3	130 - 110	16.539	19	1.145	0.091
T4	110 - 94.9427	11.707	19	1.055	0.082
T5	94.9427 - 92.5938	8.389	19	0.905	0.061
T6	92.5938 - 90	7.934	19	0.871	0.057
T7	90 - 80	7.441	19	0.831	0.050
T8	80 - 60	5.730	19	0.727	0.034
T9	60 - 40	3.073	19	0.483	0.027
T10	40 - 20	1.327	19	0.305	0.017
T11	20 - 0	0.324	19	0.130	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSP18-C-A20 w/ Mount Pipe	19	18.105	1.151	0.088	5589
134'	1900MHZ RRH (65MHZ)	19	17.624	1.151	0.088	5589
127'	(4) DB844H90E-XY w/ Mount Pipe	19	15.735	1.137	0.093	2780
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	19	13.305	1.098	0.089	8462
107'	BXA-80063/4CF	19	11.019	1.033	0.078	33196
97'	DMP65R-BU8D w/ Mount Pipe	19	8.805	0.932	0.065	3174
87'	800 10504 w/ Mount Pipe	19	6.895	0.793	0.044	3778
80'	GPS_A	19	5.730	0.727	0.034	4765
72'	GPS_A	19	4.552	0.635	0.032	4981

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
T2	133.625	Leg	A325N	0.625	5	1.227	27.612	0.044	1.05	Bolt DS
T3	130	Leg	A325N	0.750	5	8.447	39.761	0.212	1.05	Bolt DS
T6	92.5938	Leg	A325N	1.000	6	14.967	54.517	0.275	1.05	Bolt Tension
T7	90	Leg	A325N	1.000	6	16.302	54.517	0.299	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	7.476	10.164	0.736	1.05	Member Block Shear
T8	80	Leg	A325N	1.000	6	23.058	54.517	0.423	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	7.018	10.663	0.658	1.05	Member Block Shear
T9	60	Leg	A325N	1.000	6	28.807	54.517	0.528	1.05	Bolt Tension

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
T10	40	Diagonal	A325N	1.000	1	6.343	11.682	0.543	1.05	Member Block Shear
		Leg	A325N	1.000	6	33.816	54.517	0.620	1.05	Bolt Tension
		Diagonal	A325N	1.000	1	6.326	11.682	0.541	1.05	Member Block Shear
T11	20	Diagonal	A325N	1.250	1	8.330	23.701	0.351	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	136 - 133.625	1 1/2	2'4-1/2"	2'4-1/2"	76.0 K=1.00	1.767	-3.068	52.128	0.059 ¹
T2	133.625 - 130	1 1/2	3'7-1/2"	2'7-1/2"	84.0 K=1.00	1.767	-4.584	47.471	0.097 ¹
T3	130 - 110	2	20'1/32'	2'4-1/2"	57.0 K=1.00	3.142	-38.714	111.473	0.347 ¹
T4	110 - 94.9427	2 1/4	15'23/32"	2'4-3/16"	50.1 K=1.00	3.976	-82.276	148.886	0.553 ¹
T5	94.9427 - 92.5938	2 1/4	2'4-3/16"	1'2-3/16"	25.2 K=1.00	3.976	-90.868	170.799	0.532 ¹
T6	92.5938 - 90	2 1/4	2'7-1/8"	7"	12.4 K=1.00	3.976	-103.594	176.909	0.586 ¹
T7	90 - 80	PiRod 105244 w/ (2) 1-1/4" Tie Rod	10'7/32'	10'7/32'	45.4 K=1.00	6.138	-111.957	237.630	0.471 ¹
T8	80 - 60	PiRod 105217	20'13/32"	10'7/32'	37.8 K=1.00	5.301	-156.832	214.859	0.730 ¹
T9	60 - 40	PiRod 105218	20'13/32"	10'7/32'	32.4 K=1.00	7.216	-194.856	300.681	0.648 ¹
T10	40 - 20	PiRod 105218	20'13/32"	10'7/32'	32.4 K=1.00	7.216	-228.454	300.681	0.760 ¹
T11	20 - 0	PiRod 105219	20'13/32"	10'7/32'	28.4 K=1.00	9.425	-259.543	399.868	0.649 ¹

¹ $P_u / \phi P_n$ controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in ²	V_u K	ϕV_n K	Stress Ratio
T7	90 - 80	0.5	1'4-1/8"	109.8	276.204	0.196	0.825	3.482	0.238
T8	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.397	3.335	0.119
T9	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.203	3.378	0.061
T10	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.410	3.378	0.121
T11	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.078	6.958	0.156

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	136 - 133.625	3/4	3'1-1/4"	3'3/32"	134.8 K=0.70	0.442	-1.006	5.496	0.183 ¹
T2	133.625 - 130	3/4	4'9- 13/32"	2'3- 13/16"	133.5 K=0.90	0.442	-1.559	5.601	0.278 ¹
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	120.9 K=0.90	0.601	-4.177	9.300	0.449 ¹
T4	110 - 94.9427	1	5'4-5/8"	2'7-1/4"	112.5 K=0.90	0.785	-5.699	14.003	0.407 ¹
T5	94.9427 - 92.5938	1	5'5-1/4"	2'7- 19/32"	113.7 K=0.90	0.785	-6.059	13.726	0.441 ¹
T6	92.5938 - 90	1	5'4- 7/32"	2'7- 1/16"	111.8 K=0.90	0.785	-7.094	14.166	0.501 ¹
T7	90 - 80	L3x3x3/16	11'5"	5'3- 1/16"	109.4 K=1.03	1.090	-8.127	24.135	0.337 ¹
T8	80 - 60	L2 1/2x2 1/2x3/16	12'6- 1/32"	5'7- 17/32"	136.4 K=1.00	0.902	-6.699	13.873	0.483 ¹
T9	60 - 40	L3x3x3/16	13'9- 9/16"	6'3- 15/16"	127.4 K=1.00	1.090	-6.378	19.221	0.332 ¹
T10	40 - 20	L3x3x3/16	15'2- 29/32"	7'31/32' '	142.6 K=1.00	1.090	-6.707	15.345	0.437 ¹
T11	20 - 0	L3x3x5/16	16'9- 5/8"	7'10- 3/32"	159.7 K=1.00	1.780	-9.031	19.967	0.452 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	3/4	4'	3'10- 1/2"	173.6 K=0.70	0.442	-0.233	3.312	0.070 ¹
T3	130 - 110	3/4	4'5-1/8"	4'3-1/8"	190.9 K=0.70	0.442	-0.732	2.738	0.267 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	94.9427 - 92.5938	1 1/2	4'10- 7/8"	2'4- 5/16"	83.0 K=1.10	1.767	-1.574	48.040	0.033 ¹
T6	92.5938 - 90	1 1/2	4'11- 17/32"	2'4-5/8"	84.0 K=1.10	1.767	-1.794	47.473	0.038 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T1	136 - 133.625	6x3/8	4'	2'10-7/8"	322.2 K=1.00	2.250	-0.720	4.898	0.147 ¹
T3	130 - 110	KL/R > 200 (C) - 4 7/8	4'5/32"	3'10-5/32"	147.7 K=0.70	0.601	-0.732	6.229	0.117 ¹
T4	110 - 94.9427	1	4'6-9/32"	4'4-1/32"	145.7 K=0.70	0.785	-1.773	8.358	0.212 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T2	133.625 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	0.601	-0.659	6.135	0.107 ¹
T3	130 - 110	7/8	4'5-27/32"	4'3-27/32"	165.9 K=0.70	0.601	-1.768	4.935	0.358 ¹
T6	92.5938 - 90	1	4'11-13/16"	4'9-9/16"	161.2 K=0.70	0.785	-1.794	6.827	0.263 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 P _u / φP _n
T2	133.625 - 130	1 1/2	3'7-1/2"	1'	32.0	1.767	3.302	79.522	0.042 ¹
T3	130 - 110	2	20'1/32"	6"	12.0	2.188	34.312	106.689	0.322 ¹ #
T4	110 - 94.9427	2 1/4	15'23/32"	2'4-3/16"	50.1	3.976	70.004	178.924	0.391 ¹
T5	94.9427 - 92.5938	2 1/4	2'4-3/16"	1'2"	24.9	3.976	77.477	178.924	0.433 ¹
T6	92.5938 - 90	2 1/4	2'7-1/8"	7"	12.4	3.976	89.801	178.924	0.502 ¹
T7	90 - 80	PiRod 105244 w/ (2) 1-1/4" Tie Rod	10'7/32"	10'7/32"	45.4	6.138	97.809	276.204	0.354 ¹
T8	80 - 60	PiRod 105217	20'13/32"	10'7/32"	37.8	5.301	138.350	238.565	0.580 ¹
T9	60 - 40	PiRod 105218	20'13/32"	10'7/32"	32.4	7.216	172.842	324.713	0.532 ¹
T10	40 - 20	PiRod 105218	20'13/32"	10'7/32"	32.4	7.216	202.894	324.713	0.625 ¹
T11	20 - 0	PiRod 105219	20'13/32"	10'7/32"	28.4	9.425	229.581	424.115	0.541 ¹

¹ P_u / φP_n controls

Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	KI/r	ϕP_n K	A in ²	V_u K	ϕV_n K	Stress Ratio
T7	90 - 80	0.5	1'4-1/8"	109.8	276.204	0.196	0.825	3.482	0.238
T8	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.397	3.335	0.119
T9	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.203	3.378	0.061
T10	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.410	3.378	0.121
T11	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.078	6.958	0.156

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 133.625	3/4	3'1-1/4"	3'3/32"	192.5	0.442	0.938	19.880	0.047 ¹
T2	133.625 - 130	3/4	4'9-13/32"	2'3-13/16"	148.3	0.442	1.437	19.880	0.072 ¹
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	134.3	0.601	4.025	27.059	0.149 ¹
T4	110 - 94.9427	1	5'4-5/8"	2'7-1/4"	125.0	0.785	5.669	35.343	0.160 ¹
T5	94.9427 - 92.5938	1	5'5-1/4"	2'7-19/32"	126.3	0.785	5.962	35.343	0.169 ¹
T6	92.5938 - 90	1	5'4-7/32"	2'7-1/16"	124.2	0.785	6.944	35.343	0.196 ¹
T7	90 - 80	L3x3x3/16	11'5"	5'3-1/16"	69.3	0.659	7.476	28.679	0.261 ¹
T8	80 - 60	L2 1/2x2 1/2x3/16	11'11-5/32"	5'4-19/32"	86.2	0.518	7.018	22.546	0.311 ¹
T9	60 - 40	L3x3x3/16	13'1-17/32"	6'3/16"	79.5	0.659	6.343	28.679	0.221 ¹
T10	40 - 20	L3x3x3/16	15'2-29/32"	7'31/32"	93.2	0.659	6.326	28.679	0.221 ¹
T11	20 - 0	L3x3x5/16	16'9-5/8"	7'10-3/32"	105.3	1.013	8.330	44.054	0.189 ¹

¹ $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	3/4	4'	3'10-1/2"	248.0	0.442	0.377	19.880	0.019 ¹
T3	130 - 110	3/4	4'4-7/16"	4'2-7/16"	268.9	0.442	0.732	19.880	0.037 ¹

¹ $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	94.9427 - 92.5938	1 1/2	4'10-7/8"	2'4-5/16"	151.0	1.767	1.574	79.522	0.020 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	92.5938 - 90	1 1/2	4'11- 17/32"	2'4-5/8"	152.7	1.767	1.794	79.522	0.023 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	136 - 133.625	6x3/8	4'	2'10- 7/8"	322.2	2.250	0.720	72.900	0.010 ¹
T3	130 - 110	7/8	4'5/32"	3'10- 5/32"	211.0	0.601	0.732	27.059	0.027 ¹
T4	110 - 94.9427	1	4'6- 9/32"	4'4- 1/32"	208.1	0.785	1.817	35.343	0.051 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	7/8	4'	3'10- 1/2"	212.6	0.601	0.753	27.059	0.028 ¹
T3	130 - 110	7/8	4'5- 27/32"	4'3- 27/32"	237.0	0.601	1.898	27.059	0.070 ¹
T6	92.5938 - 90	1	4'11- 13/16"	4'9- 9/16"	230.3	0.785	1.794	35.343	0.051 ¹

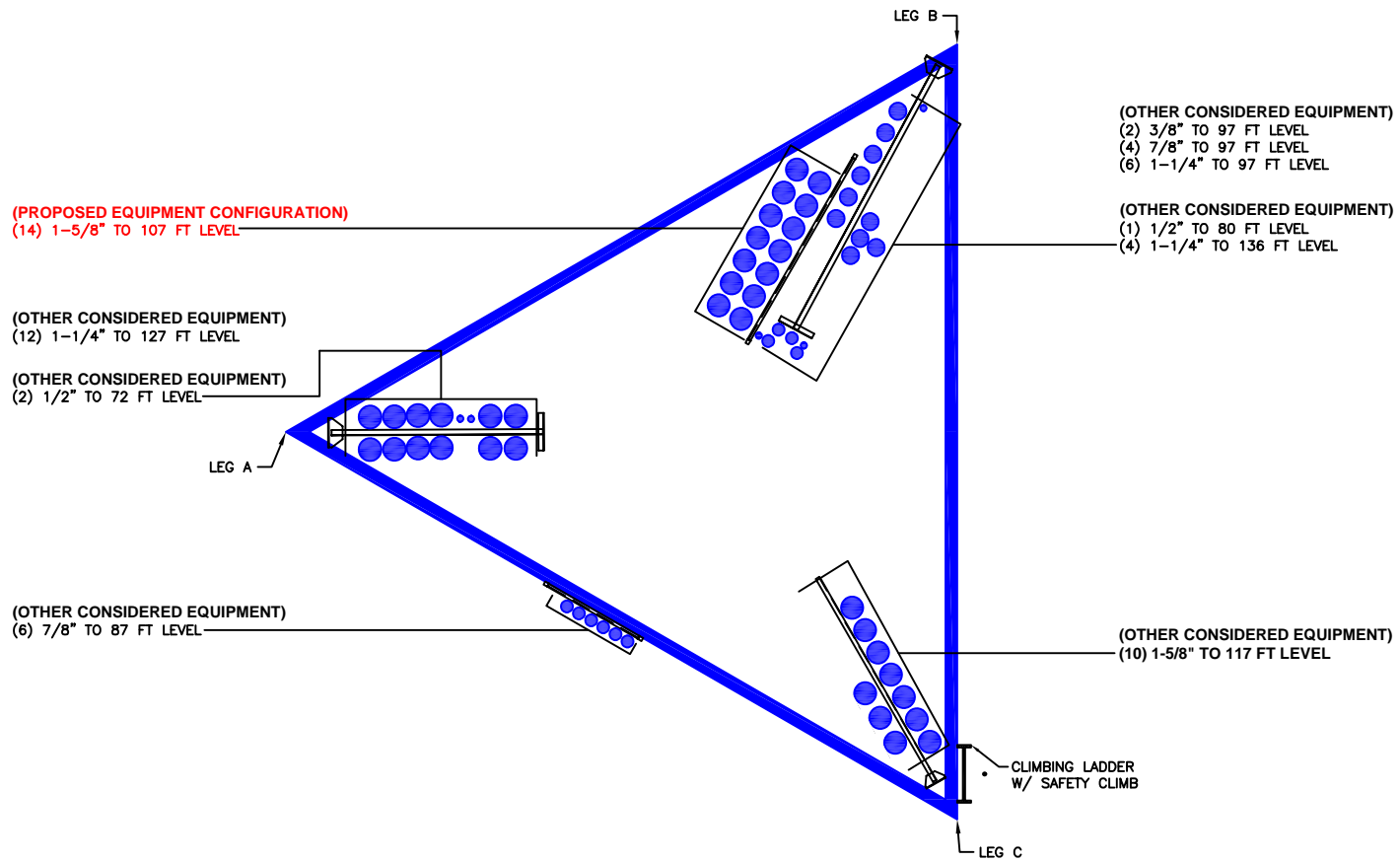
¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	136 - 133.625	Leg	1 1/2	2	-3.068	54.734	5.6	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.584	49.844	9.2	Pass
T3	130 - 110	Leg	2	29	-38.714	117.047	33.1	Pass
T4	110 - 94.9427	Leg	2 1/4	108	-82.276	156.330	52.6	Pass
T5	94.9427 - 92.5938	Leg	2 1/4	150	-90.868	179.339	50.7	Pass
T6	92.5938 - 90	Leg	2 1/4	162	-103.594	185.754	55.8	Pass
T7	90 - 80	Leg	PiRod 105244 w/ (2) 1-1/4" Tie Rod	175	-111.957	249.511	44.9	Pass
T8	80 - 60	Leg	PiRod 105217	184	-156.832	225.602	69.5	Pass
T9	60 - 40	Leg	PiRod 105218	199	-194.856	315.715	61.7	Pass
T10	40 - 20	Leg	PiRod 105218	214	-228.454	315.715	72.4	Pass
T11	20 - 0	Leg	PiRod 105219	229	-259.543	419.861	61.8	Pass
T1	136 - 133.625	Diagonal	3/4	7	-1.006	5.771	17.4	Pass
T2	133.625 - 130	Diagonal	3/4	25	-1.559	5.881	26.5	Pass
T3	130 - 110	Diagonal	7/8	40	-4.177	9.765	42.8	Pass
T4	110 - 94.9427	Diagonal	1	116	-5.699	14.703	38.8	Pass
T5	94.9427 -	Diagonal	1	156	-6.059	14.412	42.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
	92.5938								
T6	92.5938 - 90	Diagonal	1	171	-7.094	14.874	47.7	Pass	
T7	90 - 80	Diagonal	L3x3x3/16	183	-8.127	25.342	32.1	Pass	
							73.6 (b)		
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	191	-6.699	14.567	46.0	Pass	
							65.8 (b)		
T9	60 - 40	Diagonal	L3x3x3/16	202	-6.378	20.182	31.6	Pass	
							54.3 (b)		
T10	40 - 20	Diagonal	L3x3x3/16	217	-6.707	16.112	41.6	Pass	
							54.1 (b)		
T11	20 - 0	Diagonal	L3x3x5/16	232	-9.031	20.965	43.1	Pass	
T2	133.625 - 130	Horizontal	3/4	16	-0.233	3.477	6.7	Pass	
T3	130 - 110	Horizontal	3/4	43	-0.732	2.875	25.4	Pass	
T5	94.9427 - 92.5938	Secondary Horizontal	1 1/2	158	-1.574	50.442	3.1	Pass	
T6	92.5938 - 90	Secondary Horizontal	1 1/2	173	-1.794	49.847	3.6	Pass	
T1	136 - 133.625	Top Girt	6x3/8	4	-0.720	5.142	14.0	Pass	
T3	130 - 110	Top Girt	7/8	31	-0.732	6.540	11.2	Pass	
T4	110 - 94.9427	Top Girt	1	109	-1.773	8.776	20.2	Pass	
T2	133.625 - 130	Bottom Girt	7/8	19	-0.659	6.442	10.2	Pass	
T3	130 - 110	Bottom Girt	7/8	34	-1.768	5.181	34.1	Pass	
T6	92.5938 - 90	Bottom Girt	1	164	-1.794	7.169	25.0	Pass	
							Summary		
							Leg (T10)	72.4	Pass
							Diagonal (T7)	73.6	Pass
							Horizontal (T3)	25.4	Pass
							Secondary Horizontal (T6)	3.6	Pass
							Top Girt (T4)	20.2	Pass
							Bottom Girt (T3)	34.1	Pass
							Bolt Checks	70.1	Pass
							RATING =	73.6	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Truss Leg Reinforcement

BU # :	876338
Site Name:	Waterford
Order:	552701 Rev. 0
Elevation:	90-80

TIA-222 Revision:	H
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Existing Tie Rods	
Diameter, de:	1.25 in
Unbraced Length, Le:	14.18 in
Yield Strength, Fye:	50 ksi

New Tie Rods	
Diameter, dn:	1.25 in
Unbraced Length, Ln:	14.18 in
Offset, X:	0.625 in
Yield Strength, Fyn:	50 ksi

Truss Leg	
Width, w:	12 in
Unbraced Length, Lleg:	10 ft

Reactions from tnx	
Compression, C:	128.86 kip
Tension, T:	115.22 kip

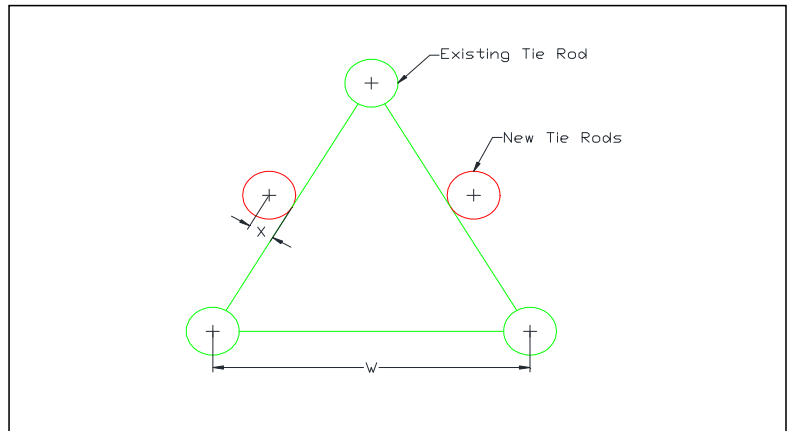
Output from tnx	
KL/r Modified Leg, KLtnx:	35.2

Length Factors	
Length Factor of Existing Tie Rods, Ke:	1
Length Factor of New Tie Rods, Kn:	1
Length Factor of the Leg, Kleg:	1

Results				
	Demand	Capacity	Rating*	Check
Compression (Existing Tie Rods), kip:	25.77	47.51	51.7%	Pass
Compression (New Tie Rods), kip:	25.77	47.51	51.7%	Pass
Compression (Modified Tie Rods), kip:	128.86	257.98	47.6%	Pass
Tension (Existing Tie Rods), kip:	23.04	55.22	39.7%	Pass
Tension (New Tie Rods), kip:	23.04	55.22	39.7%	Pass
Tension (Modified Tie Rods), kip:	115.22	276.12	39.7%	Pass

*Section 15.5 Applied

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.614	in
Leg K Factor Adjustment, K:	1.289	



Self Support Anchor Rod Capacity



Site Info	
BU #	876338
Site Name	Waterford
Order #	552701 Rev. 0

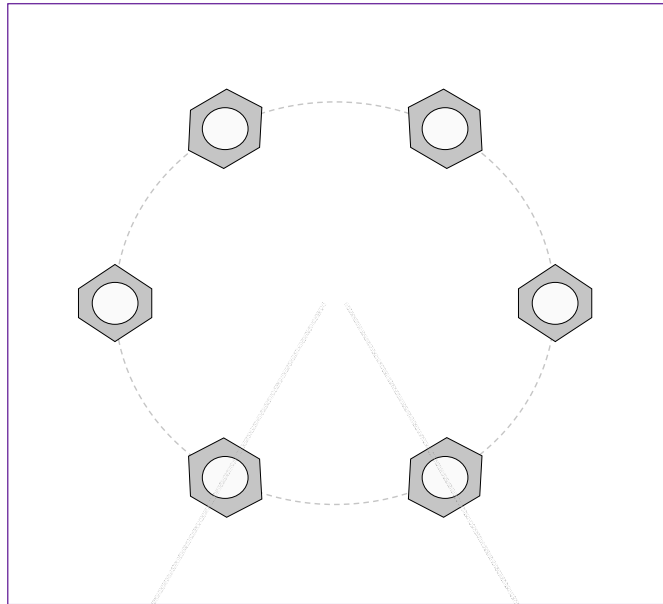
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.25

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	269.55	237.92
Shear Force (kips)	26.92	24.02

*TIA-222-H Section 15.5 Applied

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

*Anchor Rod Eccentricity Applied



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

Anchor Rod Data	
(6) 1-1/4" ϕ bolts (A687 N; Fy=105 ksi, Fu=125 ksi)	
l_{ar} (in):	1.25

Anchor Rod Summary		(units of kips, kip-in)
$Pu_t = 39.65$	$\phi Pn_t = 90.84$	Stress Rating
$Vu = 4$	$\phi Vn = 57.52$	41.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass

SST Unit Base Foundation



BU # :	876338
Site Name:	Waterford
App. Number:	552701 Rev. 0
TIA-222 Revision:	H

Top & Bot. Pad Rein. Different?:	<input type="checkbox"/>
Tower Centroid Offset?:	<input type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Global Moment, M :	3066.61	ft-kips
Global Axial, P :	49.88	kips
Global Shear, V :	39.08	kips
Leg Compression, P_{comp} :	269.55	kips
Leg Comp. Shear, V_{u,comp} :	26.92	kips
Leg Uplift, P_{uplift} :	237.92	kips
Leg Uplift. Shear, V_{u,uplift} :	24.02	kips
Tower Height, H :	136	ft
Base Face Width, BW :	14	ft
BP Dist. Above Fdn, bp_{dist} :	2.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	249.84	39.08	14.9%	Pass
<i>Bearing Pressure (ksf)</i>	6.00	2.68	44.7%	Pass
<i>Overturning (kip*ft)</i>	4596.23	3328.77	72.4%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	859.38	87.49	9.7%	Pass
<i>Pier Flexure (Tension) (kip*ft)</i>	485.38	78.07	15.3%	Pass
<i>Pier Compression (kip)</i>	3374.26	273.69	7.7%	Pass
<i>Pad Flexure (kip*ft)</i>	6695.87	960.49	13.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	777.96	149.28	18.3%	Pass
<i>Pad Shear - Comp 2-way (ksi)</i>	0.164	0.037	21.4%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	5260.90	52.49	1.0%	Pass
<i>Pad Shear - Tension 2-way (ksi)</i>	0.164	0.037	21.2%	Pass
<i>Flexural 2-way (Tension) (kip*ft)</i>	5260.90	46.84	0.8%	Pass

*Rating per TIA-222-H Section 15.5

Soil Rating*:	72.4%
Structural Rating*:	21.4%

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, dpier :	3.0	ft
Ext. Above Grade, E :	0.50	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	15	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Pad Properties		
Depth, D :	6.00	ft
Pad Width, W₁ :	23.00	ft
Pad Thickness, T :	3.25	ft
Pad Rebar Size (Bottom dir. 2), Sp₂ :	9	
Pad Rebar Quantity (Bottom dir. 2), mp₂ :	46	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	3	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Qult :	8.000	ksf
Cohesion, Cu :	0.000	ksf
Friction Angle, φ :	36	degrees
SPT Blow Count, N_{blows} :	25	
Base Friction, μ :		
Neglected Depth, N :	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

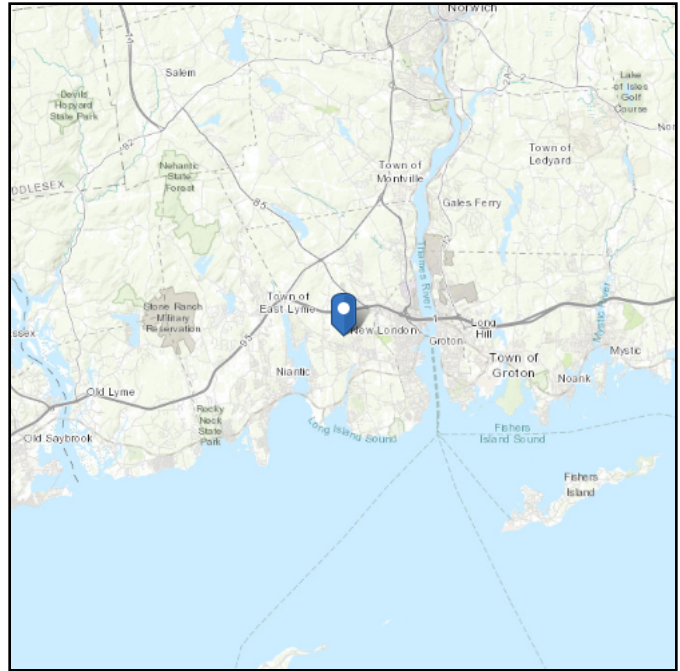
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ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 242 ft (NAVD 88)
Latitude: 41.354639
Longitude: -72.150444



Wind

Results:

Wind Speed:	134 Vmph
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	99 Vmph
100-year MRI	109 Vmph

Use 135 mph as required CT Design Criteria for New London County

Data Source: ASCE/SEI 7-10 Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

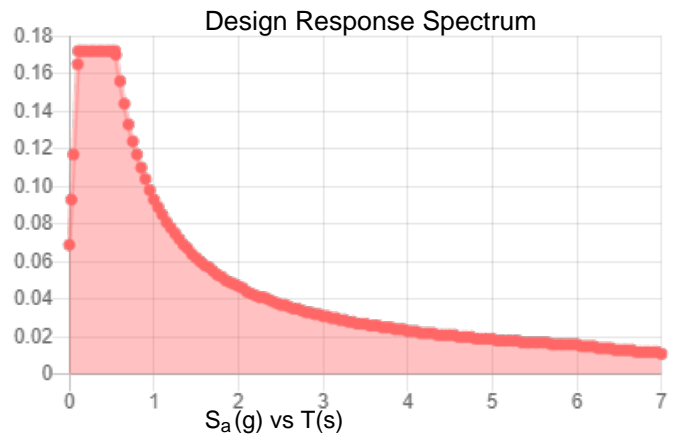
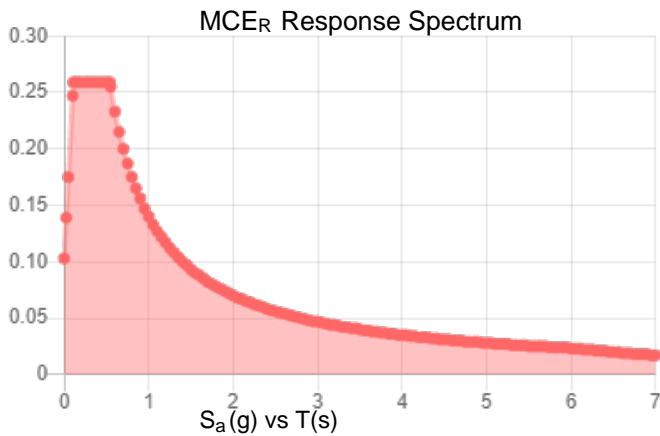
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.162	S_{DS} :	0.172
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.259	PGA _M :	0.129
S_{M1} :	0.14	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu May 06 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 0.75 in. Design Ice: 2*0.75in. = 1.50 in.
Concurrent Temperature: 15 F
Gust Speed: 50 mph

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

Date Accessed: Thu May 06 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 50-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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