Date: **October 13, 2016**

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Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Carrier Site Number:**	 CT11711A
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	806377 HRT 084 943242 401074 1310258 365116 Rev. 0
Engineering Firm Designation:	**SSOE Group Project Number:**	017-00013-00 BC 1001
Site Data:	**197 South Street, Vernon, CT 06066, Tolland County** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132 Foot – Modified Rohn Self Support Tower**	

Dear Mr. Sean Dempsey,

SSOE Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 956646, in accordance with application 365116, revision 0.

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: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 124 mph converted to a nominal 3-second gust wind speed of 96 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis

We at *SSOE Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Deepesh Savla, EIT

Respectfully submitted by:

STATE OF CONNECTICUT
BARRY W. BURGESS
NO. 26165
LICENSED
PROFESSIONAL ENGINEER
10/13/16

Barry W. Burgess, PE
Section Manager

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1) INTRODUCTION

The existing 132' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals.

The tower was originally designed for Motorola, Inc. and Metro Mobile CTS by Rohn in accordance with E.I.A. Zone "A" with 0.5" radial ice.

Modifications designed by L&W Engineering (W.O. #: 2106-2, dated 10/31/95), which consisted of replacing tower diagonals from the 100.0' to 120.0' elevations, have been considered.

Modifications designed by SSOE Group (Project #: 015-00428-01, WO #: 1059741, dated 05/15/15), which consisted of installing secondary horizontals from 0.0' to 10.0' and 80.0' to 86.7' elevations, have been considered.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 96 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
84.0	84.0	3	Andrew	LNX-6515DS-A1M w/ Mount Pipe			
		3	Ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	141.0	1	Decibel	DB413-B	3 1 2	1-1/4 5/8 7/8	
	130.0	3	Alcatel Lucent	TD-RRH8x20-25			
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		3	Alcatel Lucent	1900MHz RRH (65MHz)			
		1		T- Arm Mount [TA 702-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	118.0	6	RFS Celwave	FD9R6004/2C-3L			
	117.0	3	Alcatel Lucent	RRH2X60-PCS	1	1-5/8	1
		3	Alcatel Lucent	RRH2x60-700			
		3	Alcatel Lucent	RRH2x60-AWS			
		6	Andrew	SBNHH-1D65B w/ Mount Pipe			
		1	Antel	BXA-70063-6CF-2 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		2	Andrew	LBX-6515DS-T0M w/ Mount Pipe	12 1	7/8 1-5/8	
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	Andrew	LNX-6514DS-T6M w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		1		Sector Mount [SM 504-3]			
104.0	106.0	2	CCI Antennas	HPA-65R-BUU-H6	2 2 14	3/8 3/4 7/8	
		1	CCI Antennas	HPA-65R-BUU-H8			
		3	Ericsson	RRUS 32			
		3	Kathrein	806 10025			
		2	Raycap	DC6-48-60-18-8F			
		1	Andrew	SBNH-1D6565C w/ Mount Pipe			
		6	Communication Components	DTMABP7819VG12A			
		6	Kathrein	782-10250			
		3	Kathrein	800 10121 w/ Mount Pipe			
		2	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Ericsson	RRUS-11			
	104.0	1		Sector Mount [SM 504-3]			
94.0	94.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	
84.0	84.0				6	7/8	2
		3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 6	1-5/8 7/8	
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1		Sector Mount [SM 308-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
63.0	63.0	1	Maxrad	MPRC2449	2	3/8	
		1	Redline Communications	RDL-3000			
		1		Side Arm Mount [SO 311-1]			
56.0	59.0	1	Maxrad	GPS-TMG-20N	1	1/2	
	56.0	1		Side Arm Mount [SO 311-1]			
46.0	47.0	1	Lucent	KS24019-L112A	1	1/2	
	46.0	1		Side Arm Mount [SO 701-1]			

Notes:
1) Reserved loading.
2) Existing equipment to be removed; has not been considered in analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
127.0	127.0	4	Celwave	PD10017	-	-
		4	Generic	3' Side Arm Mount	-	-
124.0	124.0	2	Generic	8' Ø STD Dishes	-	-
112.0	112.0	6	Celwave	PD1132	-	-
		3	Generic	6' Side Arm Mount	-	-
80.0	80.0	1	Celwave	PD1109	-	-
		1	Generic	6' Side Arm Mount	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Rohn File #: 22731JC, dated 7/24/87	Doc ID#: 529704	Crown DMZ
Foundation Mapping	FDH Engineering Project #: 1310781500, dated 07/18/13	Doc ID#: 1014812	Crown DMZ
Geotechnical Reports	FDH Engineering Project #: 04-1212E, dated 12/30/04	Doc ID#: 1014866	Crown DMZ
Modification Drawings	L&W Engineering Work Order #: 2106-2, dated 10/31/95	Doc ID#: 2240842	Crown DMZ
Modification Inspection	Engineered Tower Solutions, PLLC. Project #: 150657, dated 8/19/15	Doc ID#: 5849707	Crown DMZ

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications, are in good condition, and the tower is twist free and plumb.
2) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
3) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 8/19/15 with any adjustments as noted below.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.63	36.84	9.9	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.78	36.84	13.0	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-25.88	57.13	45.3	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-33.96	70.89	47.9	Pass
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	68	-43.03	70.89	60.7	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	77	-52.70	91.43	57.6	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-83.29	160.27	52.0	Pass
T8	60 - 40	Leg	ROHN 4 X-STR	110	-112.12	159.91	70.1	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-137.52	201.25	68.3	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-151.32	201.25	75.2	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-163.52	253.28	64.6	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.15	8.62	13.3 19.5 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.07	8.59	12.5 17.0 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	36	-3.79	7.60	49.8 52.4 (b)	Pass
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	63	-4.46	11.42	39.0 52.1 (b)	Pass
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	72	-4.59	10.38	44.3 53.8 (b)	Pass
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-5.71	9.07	62.9 65.0 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-5.72	7.17	79.8	Pass
T8	60 - 40	Diagonal	L3x3x3/16	114	-6.30	9.97	63.1 65.1 (b)	Pass
T9	40 - 20	Diagonal	L3x3x1/4	135	-7.28	8.87	82.1	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-7.37	13.12	56.2 59.8 (b)	Pass
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	159	-7.77	11.73	66.3	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	85	-0.91	6.82	13.4 19.1 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	164	-2.84	10.82	26.2 36.2 (b)	Pass
T1	132 - 124	Top Girt	L2x2x3/16	6	-0.07	4.58	1.5	Pass
T3	120 - 100	Top Girt	L2x2x3/16	33	-0.13	5.79	2.3	Pass
							Summary	
						Leg (T10)	75.2	Pass
						Diagonal (T9)	82.1	Pass
						Secondary Horizontal (T11)	36.2	Pass
						Top Girt (T3)	2.3	Pass
						Bolt Checks	67.2	Pass
						Rating =	82.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Foundation (Structural)		19.4%	Pass
1	Foundation (Soil Interaction)		64.4%	Pass
1	Anchor Rods		74.7%	Pass

Structure Rating (max from all components) =	82.1%

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

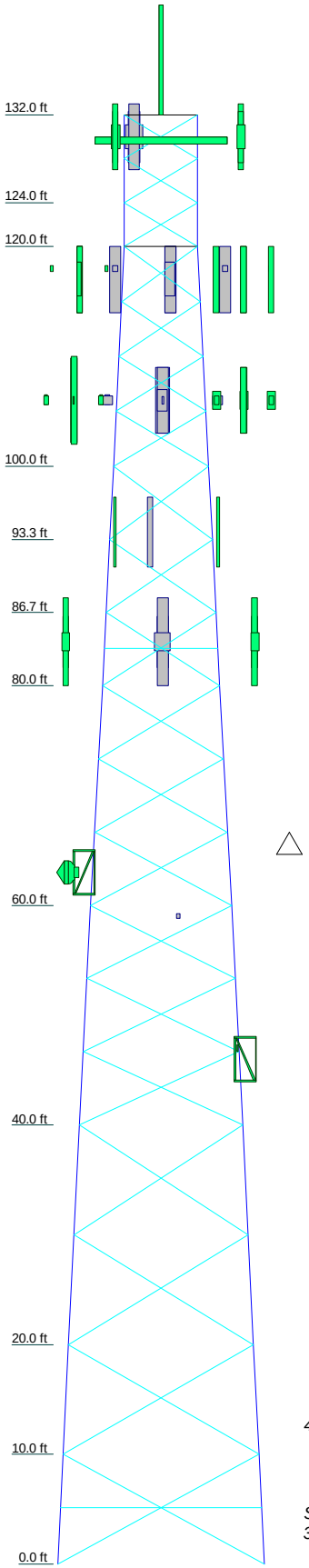
The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE Group makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11		
Legs		ROHN 2 STD		ROHN 2.5 STD		ROHN 3 STD		ROHN 3 XX-STR	ROHN 4 X-STR		ROHN 5 X-STR			
Leg Grade		A572-50												
Diagonals		L1 3/4x1 3/4x3/16		L2x2x3/16		L2 1/2x2 1/2x3/16			L3x3x3/16	L3x3x1/4		L3 1/2x3 1/2x1/4		
Diagonal Grade		A36								A572-50				
Top Girts		L2x2x3/16	N.A.	L2x2x3/16					N.A.			L2 1/2x2 1/2x3/16		
Sec. Horizontals		N.A.		N.A.			A		N.A.					
Face Width (ft)	18.7708	6.60417	6.63194	6.64583	8.6875	9.35417	10.0208	10.6875	12.7604	14.7708	16.7708	17.7708		
# Panels @ (ft)	12.1	3 @ 4	0.1	4 @ 5	1.0	0.4	0.5	9 @ 6.66667	2.0	2.5	1.4	1.6		



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16		

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 Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 82.1%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 170 K
SHEAR: 20 K

UPLIFT: -143 K
SHEAR: 17 K

AXIAL 134 K
SHEAR 7 K *MOMENT 727 kip-ft*
TORQUE 3 kip-ft
40 mph WIND - 1.00 in ICE

AXIAL 36 K
SHEAR 33 K *MOMENT 2570 kip-ft*
TORQUE 12 kip-ft
REACTIONS - 96 mph WIND

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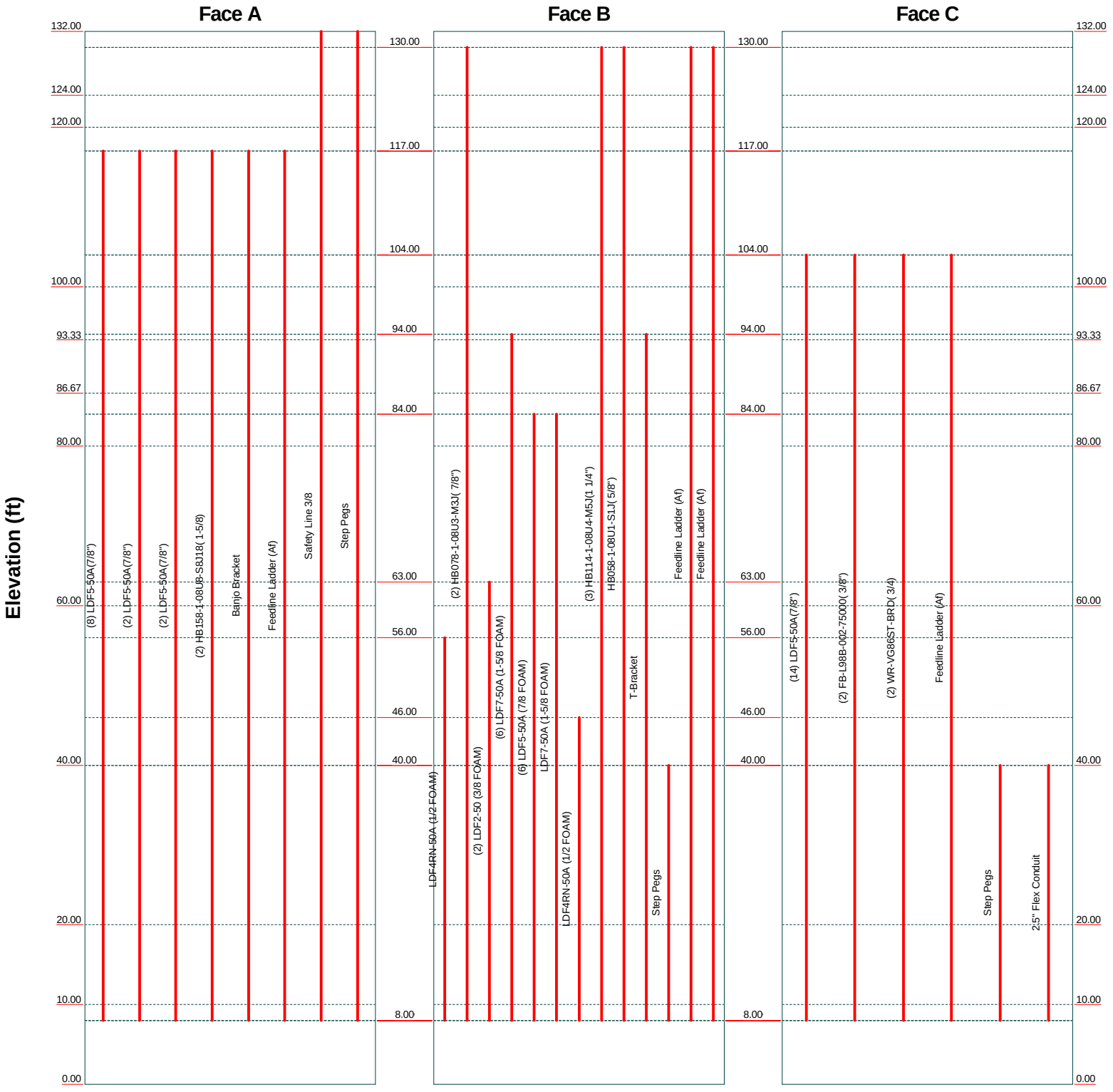
Job: BU 806377 HRT 084 943242			
Project: 017-00013-00			
Client: CCI	Drawn by: 15212	App'd:	
Code: TIA-222-G	Date: 10/13/16	Scale: NTS	
Path: C:\Users\15212\Desktop\806377\tnx\806377.en		Dwg No. E-1	

Feed Line Distribution Chart
0' - 132'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job: BU 806377 HRT 084 943242			
Project: 017-00013-00			
Client: CCI	Drawn by: 15212	App'd:	
Code: TIA-222-G	Date: 10/13/16	Scale: NTS	
Path: C:\Users\15212\Desktop\806377\tnx\806377.en		Dwg No. E-7	

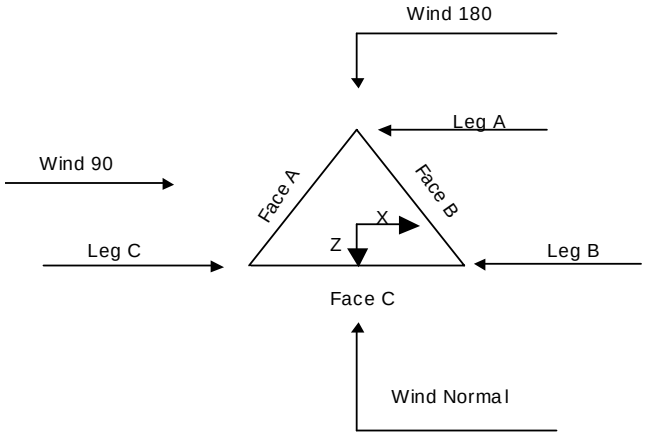
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 132.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.60 ft at the top and 18.77 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 96 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)	√	Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	132.00-124.00			6.60	1	8.00
T2	124.00-120.00			6.63	1	4.00
T3	120.00-100.00			6.65	1	20.00
T4	100.00-93.33			8.69	1	6.67
T5	93.33-86.67			9.35	1	6.67
T6	86.67-80.00			10.02	1	6.67
T7	80.00-60.00			10.69	1	20.00
T8	60.00-40.00			12.76	1	20.00
T9	40.00-20.00			14.77	1	20.00
T10	20.00-10.00			16.77	1	10.00
T11	10.00-0.00			17.77	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	132.00-124.00	4.00	X Brace	No	No	0.00	0.00
T2	124.00-120.00	4.00	X Brace	No	No	0.00	0.00
T3	120.00-100.00	5.00	X Brace	No	No	0.00	0.00
T4	100.00-93.33	6.67	X Brace	No	No	0.00	0.00
T5	93.33-86.67	6.67	X Brace	No	No	0.00	0.00
T6	86.67-80.00	6.67	X Brace	No	Yes	0.00	0.00
T7	80.00-60.00	6.67	X Brace	No	No	0.00	0.00
T8	60.00-40.00	6.67	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T10	20.00-10.00	10.00	X Brace	No	No	0.00	0.00
T11	10.00-0.00	10.00	X Brace	No	Yes	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 132.00-124.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 124.00-120.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 100.00-93.33	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 93.33-86.67	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 86.67-80.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	Pipe	ROHN 3 XX-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T10 20.00-10.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 10.00-0.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 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 132.00-124.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T3 120.00-100.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Secondary Horizontal Type*	*Secondary Horizontal Size*	*Secondary Horizontal Grade*	*Inner Bracing Type*	*Inner Bracing Size*	*Inner Bracing Grade*
T6 86.67-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 10.00-0.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 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_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 132.00-124.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T2 124.00-120.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T3 120.00-100.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T4 100.00-93.33	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T5 93.33-86.67	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T6 86.67-80.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T7 80.00-60.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T8 60.00-40.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T9 40.00-20.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T10 20.00-10.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T11 10.00-0.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 132.00-124.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 124.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 100.00-93.33	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T5 93.33-86.67	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T6 86.67-80.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-10.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T11 10.00-0.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 132.00-124.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 124.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 100.00-93.33	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 93.33-86.67	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 86.67-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-10.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T11 10.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	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 132.00-124.00	Flange	0.00 A325N	0	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T2 124.00-120.00	Flange	0.63 A325N	4	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T3 120.00-100.00	Flange	0.75 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T4 100.00-93.33	Flange	0.88 A325N	0	0.63 A325N	1	0.50 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T5 93.33-86.67	Flange	0.88 A325N	0	0.63 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T6 86.67-80.00	Flange	0.88 A325N	4	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1
T7 80.00-60.00	Flange	0.88 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T8 60.00-40.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T9 40.00-20.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T10 20.00-10.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T11 10.00-0.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.4	8	8	1.00	1.09		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.32	2	1	1.00	1.09		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.34	2	1	1.00	1.09		0.00
HB158-1-08U8-S8J18(1-5/8)	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.45	2	2	1.00	1.98		0.00
Banjo Bracket	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.33	1	1	1.00	0.50		0.01
Feedline Ladder (Af)	A	No	Af (CaAa)	117.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
Safety Line 3/8	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.38		0.00
Step Pegs	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.80		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	56.00 - 8.00	0.00	-0.43	1	1	1.00	0.63		0.00
HB078-1-08U3-M3J(7/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	-0.39	2	2	1.00	1.09		0.00
LDF2-50 (3/8 FOAM)	B	No	Ar (CaAa)	63.00 - 8.00	0.00	-0.37	2	2	1.00	0.44		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	94.00 - 8.00	-25.00	0.35	6	2	1.00	1.98		0.00
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	84.00 - 8.00	-10.00	0.4	6	3	1.00	1.09		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	84.00 - 8.00	-12.00	0.4	1	1	1.00	1.98		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	46.00 - 8.00	2.00	0.4	1	1	1.00	0.63		0.00
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.4	3	3	1.00	1.54		0.00
HB058-1-08U1-S1J(5/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.38	1	1	1.00	0.84		0.00
T-Bracket	B	No	Af (CaAa)	94.00 - 8.00	-10.00	0.4	1	1	1.00	1.00		0.01
Step Pegs	B	No	Ar (CaAa)	40.00 - 8.00	0.00	0.5	1	1	0.80	0.80		0.00
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
LDF5-50A(7/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.4	14	12	1.00	1.09		0.00
FB-L98B-002-75000(3/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.47	2	1	1.00	0.39		0.00
WR-VG86ST-BRD(3/4)	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.45	2	2	1.00	0.77		0.00
Feedline Ladder (Af)	C	No	Af (CaAa)	104.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
Step Pegs	C	No	Ar (CaAa)	40.00 - 8.00	0.00	-0.5	1	1	1.00	0.80		0.00
2.5" Flex Conduit	C	No	Ar (CaAa)	40.00 - 8.00	0.00	-0.49	1	1	1.00	2.50		0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	132.00-124.00	A	0.000	0.000	0.940	0.000	0.02
		B	0.000	0.000	10.584	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	0.000	0.000	0.470	0.000	0.01
		B	0.000	0.000	7.056	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	0.000	0.000	40.668	0.000	0.48
		B	0.000	0.000	35.280	0.000	0.45
		C	0.000	0.000	9.038	0.000	0.06
T4	100.00-93.33	A	0.000	0.000	15.810	0.000	0.19
		B	0.000	0.000	12.663	0.000	0.16
		C	0.000	0.000	15.064	0.000	0.10
T5	93.33-86.67	A	0.000	0.000	15.810	0.000	0.19
		B	0.000	0.000	20.791	0.000	0.25
		C	0.000	0.000	15.064	0.000	0.10
T6	86.67-80.00	A	0.000	0.000	15.810	0.000	0.19
		B	0.000	0.000	24.199	0.000	0.26
		C	0.000	0.000	15.064	0.000	0.10
T7	80.00-60.00	A	0.000	0.000	47.430	0.000	0.56
		B	0.000	0.000	79.677	0.000	0.80
		C	0.000	0.000	45.191	0.000	0.29
T8	60.00-40.00	A	0.000	0.000	47.430	0.000	0.56
		B	0.000	0.000	82.559	0.000	0.81
		C	0.000	0.000	45.191	0.000	0.29
T9	40.00-20.00	A	0.000	0.000	47.430	0.000	0.56
		B	0.000	0.000	85.293	0.000	0.86
		C	0.000	0.000	51.791	0.000	0.35
T10	20.00-10.00	A	0.000	0.000	23.715	0.000	0.28
		B	0.000	0.000	42.647	0.000	0.43
		C	0.000	0.000	25.895	0.000	0.17
T11	10.00-0.00	A	0.000	0.000	4.743	0.000	0.06
		B	0.000	0.000	8.529	0.000	0.09
		C	0.000	0.000	5.179	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	132.00-124.00	A	2.290	0.000	0.000	8.269	0.000	0.15
		B		0.000	0.000	31.531	0.000	0.62
		C		0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	2.279	0.000	0.000	4.117	0.000	0.08
		B		0.000	0.000	20.964	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	2.256	0.000	0.000	154.539	0.000	2.82
		B		0.000	0.000	104.215	0.000	2.03
		C		0.000	0.000	27.010	0.000	0.48
T4	100.00-93.33	A	2.227	0.000	0.000	58.988	0.000	1.07
		B		0.000	0.000	36.195	0.000	0.71
		C		0.000	0.000	44.784	0.000	0.78
T5	93.33-86.67	A	2.211	0.000	0.000	58.760	0.000	1.06
		B		0.000	0.000	51.346	0.000	1.07
		C		0.000	0.000	44.657	0.000	0.78
T6	86.67-80.00	A	2.194	0.000	0.000	58.517	0.000	1.05
		B		0.000	0.000	59.820	0.000	1.22
		C		0.000	0.000	44.521	0.000	0.77
T7	80.00-60.00	A	2.156	0.000	0.000	173.919	0.000	3.08
		B		0.000	0.000	197.941	0.000	3.91
		C		0.000	0.000	132.647	0.000	2.27
T8	60.00-40.00	A	2.085	0.000	0.000	170.850	0.000	2.97
		B		0.000	0.000	221.180	0.000	4.09
		C		0.000	0.000	130.927	0.000	2.19
T9	40.00-20.00	A	1.981	0.000	0.000	166.387	0.000	2.80
		B		0.000	0.000	232.829	0.000	4.19
		C		0.000	0.000	150.875	0.000	2.49

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T10	20.00-10.00	A	1.848	0.000	0.000	80.346	0.000	1.30
		B		0.000	0.000	111.990	0.000	1.95
		C		0.000	0.000	73.311	0.000	1.16
T11	10.00-0.00	A	1.656	0.000	0.000	15.245	0.000	0.23
		B		0.000	0.000	21.116	0.000	0.35
		C		0.000	0.000	14.047	0.000	0.21

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	132.00-124.00	2.82	-1.30	2.32	-1.92
T2	124.00-120.00	3.44	-1.44	2.88	-2.03
T3	120.00-100.00	2.44	-4.19	1.95	-4.25
T4	100.00-93.33	4.44	-2.04	3.73	-2.58
T5	93.33-86.67	5.11	-1.02	4.28	-2.06
T6	86.67-80.00	5.68	-0.64	4.55	-1.82
T7	80.00-60.00	6.84	-0.51	5.40	-1.93
T8	60.00-40.00	7.69	-0.84	6.14	-2.48
T9	40.00-20.00	9.51	-0.48	8.24	-1.92
T10	20.00-10.00	10.22	-0.55	8.99	-2.08
T11	10.00-0.00	5.03	-0.28	5.01	-1.14

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	9	Safety Line 3/8	124.00 - 132.00	0.6000	0.5030
T1	10	Step Pegs	124.00 - 132.00	0.6000	0.5030
T1	13	HB078-1-08U3-M3J(7/8")	124.00 - 130.00	0.6000	0.5030
T1	19	HB114-1-08U4-M5J(1 1/4")	124.00 - 130.00	0.6000	0.5030
T1	20	HB058-1-08U1-S1J(5/8")	124.00 - 130.00	0.6000	0.5030
T1	23	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5030
T1	24	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5030
T2	9	Safety Line 3/8	120.00 - 124.00	0.6000	0.5660
T2	10	Step Pegs	120.00 - 124.00	0.6000	0.5660
T2	13	HB078-1-08U3-M3J(7/8")	120.00 - 124.00	0.6000	0.5660
T2	19	HB114-1-08U4-M5J(1 1/4")	120.00 - 124.00	0.6000	0.5660
T2	20	HB058-1-08U1-S1J(5/8")	120.00 - 124.00	0.6000	0.5660
T2	23	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5660
T2	24	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5660
T3	2	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T3	3	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	4	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	6	HB158-1-08U8-S8J18(1-5/8)	100.00 - 117.00	0.6000	0.5973
T3	7	Banjo Bracket	100.00 - 117.00	0.6000	0.5973
T3	8	Feedline Ladder (Af)	100.00 - 117.00	0.6000	0.5973
T3	9	Safety Line 3/8	100.00 - 120.00	0.6000	0.5973
T3	10	Step Pegs	100.00 - 120.00	0.6000	0.5973
T3	13	HB078-1-08U3-M3J(7/8")	100.00 - 120.00	0.6000	0.5973
T3	19	HB114-1-08U4-M5J(1 1/4")	100.00 - 120.00	0.6000	0.5973
T3	20	HB058-1-08U1-S1J(5/8")	100.00 - 120.00	0.6000	0.5973
T3	23	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5973
T3	24	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5973
T3	26	LDF5-50A(7/8")	100.00 - 104.00	0.6000	0.5973
T3	27	FB-L98B-002-75000(3/8")	100.00 - 104.00	0.6000	0.5973
T3	28	WR-VG86ST-BRD(3/4)	100.00 - 104.00	0.6000	0.5973
T3	29	Feedline Ladder (Af)	100.00 - 104.00	0.6000	0.5973
T4	2	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	3	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	4	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	6	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T4	7	Banjo Bracket	93.33 - 100.00	0.6000	0.6000
T4	8	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	9	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T4	10	Step Pegs	93.33 - 100.00	0.6000	0.6000
T4	13	HB078-1-08U3-M3J(7/8")	93.33 - 100.00	0.6000	0.6000
T4	15	LDF7-50A (1-5/8 FOAM)	93.33 - 94.00	0.6000	0.6000
T4	19	HB114-1-08U4-M5J(1 1/4")	93.33 - 100.00	0.6000	0.6000
T4	20	HB058-1-08U1-S1J(5/8")	93.33 - 100.00	0.6000	0.6000
T4	21	T-Bracket	93.33 - 94.00	0.6000	0.6000
T4	23	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	24	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	26	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	27	FB-L98B-002-75000(3/8")	93.33 - 100.00	0.6000	0.6000
T4	28	WR-VG86ST-BRD(3/4)	93.33 - 100.00	0.6000	0.6000
T4	29	Feedline Ladder (Af)	93.33 -	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
			100.00		
T5	2	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	3	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	4	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	6	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T5	7	Banjo Bracket	86.67 - 93.33	0.6000	0.6000
T5	8	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	9	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T5	10	Step Pegs	86.67 - 93.33	0.6000	0.6000
T5	13	HB078-1-08U3-M3J(7/8")	86.67 - 93.33	0.6000	0.6000
T5	15	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T5	19	HB114-1-08U4-M5J(1 1/4")	86.67 - 93.33	0.6000	0.6000
T5	20	HB058-1-08U1-S1J(5/8")	86.67 - 93.33	0.6000	0.6000
T5	21	T-Bracket	86.67 - 93.33	0.6000	0.6000
T5	23	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	24	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	26	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	27	FB-L98B-002-75000(3/8")	86.67 - 93.33	0.6000	0.6000
T5	28	WR-VG86ST-BRD(3/4)	86.67 - 93.33	0.6000	0.6000
T5	29	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T6	2	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	3	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	4	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	6	HB158-1-08U8-S8J18(1-5/8)	80.00 - 86.67	0.6000	0.6000
T6	7	Banjo Bracket	80.00 - 86.67	0.6000	0.6000
T6	8	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	9	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T6	10	Step Pegs	80.00 - 86.67	0.6000	0.6000
T6	13	HB078-1-08U3-M3J(7/8")	80.00 - 86.67	0.6000	0.6000
T6	15	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T6	16	LDF5-50A (7/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	17	LDF7-50A (1-5/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	19	HB114-1-08U4-M5J(1 1/4")	80.00 - 86.67	0.6000	0.6000
T6	20	HB058-1-08U1-S1J(5/8")	80.00 - 86.67	0.6000	0.6000
T6	21	T-Bracket	80.00 - 86.67	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T6	23	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	24	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	26	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	27	FB-L98B-002-75000(3/8")	80.00 - 86.67	0.6000	0.6000
T6	28	WR-VG86ST-BRD(3/4)	80.00 - 86.67	0.6000	0.6000
T6	29	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T7	2	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	3	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	4	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	6	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	7	Banjo Bracket	60.00 - 80.00	0.6000	0.6000
T7	8	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	9	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	10	Step Pegs	60.00 - 80.00	0.6000	0.6000
T7	13	HB078-1-08U3-M3J(7/8")	60.00 - 80.00	0.6000	0.6000
T7	14	LDF2-50 (3/8 FOAM)	60.00 - 63.00	0.6000	0.6000
T7	15	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	16	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	17	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	19	HB114-1-08U4-M5J(1 1/4")	60.00 - 80.00	0.6000	0.6000
T7	20	HB058-1-08U1-S1J(5/8")	60.00 - 80.00	0.6000	0.6000
T7	21	T-Bracket	60.00 - 80.00	0.6000	0.6000
T7	23	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	24	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	26	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	27	FB-L98B-002-75000(3/8")	60.00 - 80.00	0.6000	0.6000
T7	28	WR-VG86ST-BRD(3/4)	60.00 - 80.00	0.6000	0.6000
T7	29	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	2	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	3	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	4	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	6	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	7	Banjo Bracket	40.00 - 60.00	0.6000	0.6000
T8	8	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	9	Safety Line 3/8	40.00 -	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T8	10	Step Pegs	60.00 40.00 -	0.6000	0.6000
T8	12	LDF4RN-50A (1/2 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	13	HB078-1-08U3-M3J(7/8")	56.00 40.00 -	0.6000	0.6000
T8	14	LDF2-50 (3/8 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	15	LDF7-50A (1-5/8 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	16	LDF5-50A (7/8 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	17	LDF7-50A (1-5/8 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	18	LDF4RN-50A (1/2 FOAM)	60.00 40.00 -	0.6000	0.6000
T8	19	HB114-1-08U4-M5J(1 1/4")	46.00 40.00 -	0.6000	0.6000
T8	20	HB058-1-08U1-S1J(5/8")	60.00 40.00 -	0.6000	0.6000
T8	21	T-Bracket	60.00 40.00 -	0.6000	0.6000
T8	23	Feedline Ladder (Af)	60.00 40.00 -	0.6000	0.6000
T8	24	Feedline Ladder (Af)	60.00 40.00 -	0.6000	0.6000
T8	26	LDF5-50A(7/8")	60.00 40.00 -	0.6000	0.6000
T8	27	FB-L98B-002-75000(3/8")	60.00 40.00 -	0.6000	0.6000
T8	28	WR-VG86ST-BRD(3/4)	60.00 40.00 -	0.6000	0.6000
T8	29	Feedline Ladder (Af)	60.00 40.00 -	0.6000	0.6000
T9	2	LDF5-50A(7/8")	60.00 20.00 -	0.6000	0.6000
T9	3	LDF5-50A(7/8")	40.00 20.00 -	0.6000	0.6000
T9	4	LDF5-50A(7/8")	40.00 20.00 -	0.6000	0.6000
T9	6	HB158-1-08U8-S8J18(1-5/8)	40.00 20.00 -	0.6000	0.6000
T9	7	Banjo Bracket	40.00 20.00 -	0.6000	0.6000
T9	8	Feedline Ladder (Af)	40.00 20.00 -	0.6000	0.6000
T9	9	Safety Line 3/8	40.00 20.00 -	0.6000	0.6000
T9	10	Step Pegs	40.00 20.00 -	0.6000	0.6000
T9	12	LDF4RN-50A (1/2 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	13	HB078-1-08U3-M3J(7/8")	40.00 20.00 -	0.6000	0.6000
T9	14	LDF2-50 (3/8 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	15	LDF7-50A (1-5/8 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	16	LDF5-50A (7/8 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	17	LDF7-50A (1-5/8 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	18	LDF4RN-50A (1/2 FOAM)	40.00 20.00 -	0.6000	0.6000
T9	19	HB114-1-08U4-M5J(1 1/4")	40.00 20.00 -	0.6000	0.6000
T9	20	HB058-1-08U1-S1J(5/8")	40.00 20.00 -	0.6000	0.6000
			40.00		

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T9	21	T-Bracket	20.00 - 40.00	0.6000	0.6000
T9	22	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	23	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	24	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	26	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	27	FB-L98B-002-75000(3/8")	20.00 - 40.00	0.6000	0.6000
T9	28	WR-VG86ST-BRD(3/4)	20.00 - 40.00	0.6000	0.6000
T9	29	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	30	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	31	2.5" Flex Conduit	20.00 - 40.00	0.6000	0.6000
T10	2	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	3	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	4	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	6	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000
T10	7	Banjo Bracket	10.00 - 20.00	0.6000	0.6000
T10	8	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	9	Safety Line 3/8	10.00 - 20.00	0.6000	0.6000
T10	10	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	12	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	13	HB078-1-08U3-M3J(7/8")	10.00 - 20.00	0.6000	0.6000
T10	14	LDF2-50 (3/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	15	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	16	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	17	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	18	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	19	HB114-1-08U4-M5J(1 1/4")	10.00 - 20.00	0.6000	0.6000
T10	20	HB058-1-08U1-S1J(5/8")	10.00 - 20.00	0.6000	0.6000
T10	21	T-Bracket	10.00 - 20.00	0.6000	0.6000
T10	22	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	23	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	24	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	26	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	27	FB-L98B-002-75000(3/8")	10.00 - 20.00	0.6000	0.6000
T10	28	WR-VG86ST-BRD(3/4)	10.00 - 20.00	0.6000	0.6000
T10	29	Feedline Ladder (Af)	10.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	30	Step Pegs	20.00 10.00 - 20.00	0.6000	0.6000
T10	31	2.5" Flex Conduit	10.00 - 20.00	0.6000	0.6000
T11	2	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	3	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	4	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	6	HB158-1-08U8-S8J18(1-5/8)	8.00 - 10.00	0.6000	0.6000
T11	7	Banjo Bracket	8.00 - 10.00	0.6000	0.6000
T11	8	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	9	Safety Line 3/8	8.00 - 10.00	0.6000	0.6000
T11	10	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	12	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	13	HB078-1-08U3-M3J(7/8")	8.00 - 10.00	0.6000	0.6000
T11	14	LDF2-50 (3/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	15	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	16	LDF5-50A (7/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	17	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	18	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	19	HB114-1-08U4-M5J(1 1/4")	8.00 - 10.00	0.6000	0.6000
T11	20	HB058-1-08U1-S1J(5/8")	8.00 - 10.00	0.6000	0.6000
T11	21	T-Bracket	8.00 - 10.00	0.6000	0.6000
T11	22	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	23	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	24	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	26	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	27	FB-L98B-002-75000(3/8")	8.00 - 10.00	0.6000	0.6000
T11	28	WR-VG86ST-BRD(3/4)	8.00 - 10.00	0.6000	0.6000
T11	29	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	30	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	31	2.5" Flex Conduit	8.00 - 10.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3" x 10' mount pipe	B	None		0.00	137.00	No Ice 1/2" Ice 1" Ice	3.00 4.03 5.03	3.00 4.03 5.03	0.03 0.05 0.08
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	0.08 0.14 0.22
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
1900MHZ RRH (65MHz)	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
800MHz 2x50W RRH W/FILTER	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice 1/2" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
TD-RRH8x20-25	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	0.08 0.14 0.22
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
800MHz 2x50W RRH W/FILTER	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
1900MHZ RRH (65MHz)	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TD-RRH8x20-25	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
DB413-B	B	From Leg	3.15 -2.46 11.00	-38.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	2.55 4.59 6.63	2.55 4.59 6.63	0.03 0.04 0.05
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	0.08 0.14 0.22
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
800MHz 2x50W RRH W/FILTER	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
1900MHZ RRH (65MHz)	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TD-RRH8x20-25	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
T-Arm Mount [TA 702-3]	C	None		0.00	130.00	1" Ice No Ice 1/2" Ice 1" Ice	5.64 6.55 7.46	5.64 6.55 7.46	0.34 0.43 0.52
LBX-6515DS-T0M w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	1" Ice No Ice 1/2" Ice 1" Ice	8.60 9.17 9.69	6.10 7.27 8.16	0.05 0.11 0.19
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	1" Ice No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	1" Ice No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) FD9R6004/2C-3L	A	From Leg	3.91 0.83 1.00	12.00	117.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
DB-T1-6Z-8AB-0Z	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
RRH2x60-AWS	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-PCS	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
RRH2x60-700	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
LBX-6515DS-T0M w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	8.60 9.17 9.69	6.10 7.27 8.16	0.05 0.11 0.19
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
(2) FD9R6004/2C-3L	B	From Leg	3.53 -1.88 1.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
RRH2x60-AWS	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
DB-T1-6Z-8AB-0Z	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
RRH2x60-700	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-PCS	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
LNX-6514DS-T6M w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
SBNHH-1D65B w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
SBNHH-1D65B w/ Mount	C	From Leg	3.71	32.00	117.00	No Ice	8.16	6.82	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			1.50 0.00			1/2" Ice 1" Ice	8.62 9.09	7.78 8.61	0.13 0.20
(2) FD9R6004/2C-3L	C	From Leg	3.71 1.50 1.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
RRH2x60-AWS	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2x60-700	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-PCS	C	From Leg	3.71 1.50 0.00	32.00	117.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
Sector Mount [SM 504-3]	C	None		0.00	117.00	No Ice 1/2" Ice 1" Ice	34.25 48.98 63.71	34.25 48.98 63.71	1.71 2.29 2.86
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.34 6.04	0.07 0.11 0.17
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
(2) 782-10250	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	0.45 0.54 0.64	0.25 0.32 0.40	0.01 0.01 0.02
(2) RRUS-11	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.37 1.55 1.74	0.05 0.07 0.09
DC6-48-60-18-8F	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	2.20 2.40 2.60	2.20 2.40 2.60	0.02 0.04 0.07
(2) DTMABP7819VG12A	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
860 10025	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	0.16 0.21 0.28	0.13 0.19 0.25	0.00 0.00 0.01
RRUS 32	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	3.33 3.60 3.87	1.98 2.21 2.45	0.06 0.08 0.10
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.34 6.04	0.07 0.11 0.17
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.14	2.00	104.00	No Ice 1/2"	9.90 10.47	8.11 9.30	0.08 0.16

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			2.00			Ice	11.01	10.21	0.25
						1" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	2.00	104.00	No Ice	8.26	6.30	0.07
			0.14			1/2"	8.82	7.48	0.14
			2.00			Ice	9.35	8.37	0.21
						1" Ice			
(2) 782-10250	B	From Leg	4.00	2.00	104.00	No Ice	0.45	0.25	0.01
			0.14			1/2"	0.54	0.32	0.01
			2.00			Ice	0.64	0.40	0.02
						1" Ice			
(3) RRUS-11	B	From Leg	4.00	2.00	104.00	No Ice	2.78	1.19	0.05
			0.14			1/2"	2.99	1.33	0.07
			2.00			Ice	3.21	1.49	0.09
						1" Ice			
(2) DTMABP7819VG12A	B	From Leg	4.00	2.00	104.00	No Ice	0.98	0.34	0.02
			0.14			1/2"	1.10	0.42	0.03
			2.00			Ice	1.23	0.51	0.04
						1" Ice			
860 10025	B	From Leg	4.00	2.00	104.00	No Ice	0.16	0.13	0.00
			0.14			1/2"	0.21	0.19	0.00
			2.00			Ice	0.28	0.25	0.01
						1" Ice			
RRUS 32	B	From Leg	4.00	2.00	104.00	No Ice	3.33	1.98	0.06
			0.14			1/2"	3.60	2.21	0.08
			2.00			Ice	3.87	2.45	0.10
						1" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	2.00	104.00	No Ice	2.20	2.20	0.02
			0.14			1/2"	2.40	2.40	0.04
			2.00			Ice	2.60	2.60	0.07
						1" Ice			
800 10121 w/ Mount Pipe	C	From Leg	3.91	12.00	104.00	No Ice	5.39	4.60	0.07
			0.83			1/2"	5.81	5.34	0.11
			2.00			Ice	6.23	6.04	0.17
						1" Ice			
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	3.91	12.00	104.00	No Ice	13.21	9.58	0.10
			0.83			1/2"	13.90	11.05	0.20
			2.00			Ice	14.59	12.50	0.30
						1" Ice			
SBNH-1D6565C w/ Mount Pipe	C	From Leg	3.91	12.00	104.00	No Ice	11.68	9.84	0.09
			0.83			1/2"	12.40	11.37	0.18
			2.00			Ice	13.14	12.91	0.28
						1" Ice			
(2) 782-10250	C	From Leg	3.91	12.00	104.00	No Ice	0.45	0.25	0.01
			0.83			1/2"	0.54	0.32	0.01
			2.00			Ice	0.64	0.40	0.02
						1" Ice			
(2) DTMABP7819VG12A	C	From Leg	3.91	12.00	104.00	No Ice	0.98	0.34	0.02
			0.83			1/2"	1.10	0.42	0.03
			2.00			Ice	1.23	0.51	0.04
						1" Ice			
RRUS-11	C	From Leg	3.91	12.00	104.00	No Ice	0.00	1.37	0.05
			0.83			1/2"	0.00	1.55	0.07
			2.00			Ice	0.00	1.74	0.09
						1" Ice			
860 10025	C	From Leg	3.91	12.00	104.00	No Ice	0.16	0.13	0.00
			0.83			1/2"	0.21	0.19	0.00
			2.00			Ice	0.28	0.25	0.01
						1" Ice			
RRUS 32	C	From Leg	3.91	12.00	104.00	No Ice	3.33	1.98	0.06
			0.83			1/2"	3.60	2.21	0.08
			2.00			Ice	3.87	2.45	0.10
						1" Ice			
Sector Mount [SM 504-3]	C	None		0.00	104.00	No Ice	34.25	34.25	1.71
						1/2"	48.98	48.98	2.29
						Ice	63.71	63.71	2.86

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
742 213 w/ Mount Pipe	A	From Leg	0.03 -1.00 0.00	-88.00	94.00	1" Ice No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
742 213 w/ Mount Pipe	B	From Leg	0.03 -1.00 0.00	-88.00	94.00	1" Ice No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
742 213 w/ Mount Pipe	C	From Leg	0.03 -1.00 0.00	-88.00	94.00	1" Ice No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	0.05 0.09 0.15
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	11.41 12.03 12.65	9.60 11.02 12.29	0.08 0.17 0.26
KRY 112 144/1	A	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	11.41 12.03 12.65	9.60 11.02 12.29	0.08 0.17 0.26
KRY 112 144/1	B	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
RRUS 11 B12	B	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.14 0.00	2.00	84.00	1" Ice No Ice 1/2" Ice 1" Ice	11.41 12.03 12.65	9.60 11.02 12.29	0.08 0.17 0.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
KRY 112 144/1	C	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
RRUS 11 B12	C	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
Sector Mount [SM 308-3]	C	None		0.00	84.00	No Ice 1/2" Ice 1" Ice	22.34 31.70 41.06	22.34 31.70 41.06	0.38 0.83 1.28
RDL-3000	C	From Leg	0.00 3.00 0.00	90.00	63.00	No Ice 1/2" Ice 1" Ice	1.01 1.13 1.27	0.26 0.34 0.42	0.01 0.01 0.02
Side Arm Mount [SO 311-1]	C	From Leg	0.00 1.50 0.00	90.00	63.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	0.06 0.09 0.13
GPS-TMG-20N	A	From Leg	2.54 1.59 3.00	32.00	56.00	No Ice 1/2" Ice 1" Ice	0.13 0.18 0.24	0.13 0.18 0.24	0.00 0.00 0.01
Side Arm Mount [SO 311-1]	A	From Leg	1.27 0.79 0.00	32.00	56.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	0.06 0.09 0.13
KS24019-L112A	B	From Leg	1.41 2.65 1.00	62.00	46.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.14 0.20 0.26	0.01 0.01 0.01
Side Arm Mount [SO 701-1]	B	From Leg	0.70 0.00 0.00	62.00	46.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
MPRC2449	C	Paraboloid w/Radome	From Leg	0.00 3.00 0.00	90.00		63.00	2.17	No Ice 1/2" Ice 1" Ice	3.69 3.98 4.27	0.02 0.04 0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice

Comb. No.	Description
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 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	132 - 124	Leg	Max Tension	7	1.33	0.13	0.00
			Max. Compression	31	-3.63	-0.02	-0.00
			Max. Mx	2	-1.04	-0.50	-0.03
			Max. My	4	-0.74	-0.00	0.56
			Max. Vy	10	-0.40	0.28	0.01
			Max. Vx	4	0.43	-0.00	-0.28
		Diagonal	Max Tension	24	1.19	0.00	0.00
			Max. Compression	12	-1.15	0.00	0.00
			Max. Mx	28	0.28	0.03	0.00
			Max. My	12	-1.12	0.00	0.00
			Max. Vy	29	-0.03	0.03	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.07	0.00	0.00
			Max. Compression	11	-0.07	0.00	0.00
			Max. Mx	29	0.02	-0.09	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	31	0.00	0.00	0.00
			Max. Vy	29	-0.06	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T2	124 - 120	Leg	Max Tension	7	3.19	-0.31	0.01
			Max. Compression	10	-4.78	0.29	0.02
			Max. Mx	6	3.04	-0.32	0.01
			Max. My	20	-0.89	-0.02	-0.35
			Max. Vy	6	0.13	-0.32	0.01
			Max. Vx	20	0.13	-0.02	-0.35
		Diagonal	Max Tension	12	1.04	0.00	0.00
			Max. Compression	24	-1.07	0.00	0.00
			Max. Mx	31	0.18	0.03	0.00
			Max. My	5	-0.86	0.00	-0.00
			Max. Vy	31	-0.03	0.03	0.00
			Max. Vx	5	0.00	0.00	-0.00
T3	120 - 100	Leg	Max Tension	7	18.85	-0.44	0.00
			Max. Compression	2	-25.88	0.19	-0.01
			Max. Mx	6	4.05	1.00	0.03
			Max. My	20	-2.40	-0.05	1.13
			Max. Vy	22	-0.94	-0.45	-0.01
			Max. Vx	8	-0.85	-0.03	0.55
		Diagonal	Max Tension	24	3.73	0.00	0.00
			Max. Compression	12	-3.79	0.00	0.00
			Max. Mx	28	0.17	0.05	0.01
			Max. My	24	-3.70	0.00	-0.01
			Max. Vy	28	0.05	0.04	0.01
			Max. Vx	29	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.21	0.00	0.00
			Max. Compression	11	-0.13	0.00	0.00
			Max. Mx	29	0.15	-0.09	0.00
			Max. My	31	0.12	0.00	0.00
			Max. Vy	29	0.06	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T4	100 - 93.3333	Leg	Max Tension	7	26.14	-0.12	-0.00
			Max. Compression	2	-33.96	0.15	-0.02
			Max. Mx	22	24.60	-0.26	-0.01
			Max. My	8	-4.67	-0.04	0.42
			Max. Vy	18	-0.15	0.16	0.00
			Max. Vx	8	0.13	-0.04	0.42
		Diagonal	Max Tension	12	4.42	0.00	0.00
			Max. Compression	12	-4.46	0.00	0.00
			Max. Mx	27	0.87	0.08	0.01
			Max. My	38	0.55	0.07	-0.01
			Max. Vy	27	-0.06	0.08	0.01
			Max. Vx	38	0.00	0.00	0.00
T5	93.3333 - 86.6667	Leg	Max Tension	7	34.31	-0.04	-0.01
			Max. Compression	10	-43.03	-0.02	0.00
			Max. Mx	18	-42.01	0.16	0.00
			Max. My	4	-5.18	-0.04	-0.34
			Max. Vy	18	0.07	0.16	0.00
			Max. Vx	4	0.10	-0.04	-0.34
		Diagonal	Max Tension	12	4.57	0.00	0.00
			Max. Compression	12	-4.59	0.00	0.00
			Max. Mx	27	0.72	0.08	-0.01
			Max. My	30	-0.34	0.07	0.01
			Max. Vy	29	0.06	0.07	-0.01
			Max. Vx	30	-0.00	0.00	0.00
T6	86.6667 - 80	Leg	Max Tension	7	42.42	-0.04	-0.01
			Max. Compression	10	-52.70	-0.09	0.00
			Max. Mx	10	-52.66	0.44	0.00
			Max. My	4	-5.52	-0.04	-0.34
			Max. Vy	6	0.72	-0.35	0.00
			Max. Vx	16	-0.50	0.04	-0.00
		Diagonal	Max Tension	13	5.51	0.03	-0.00
			Max. Compression	12	-5.71	0.00	0.00
			Max. Mx	27	0.85	0.09	0.01
			Max. My	29	0.85	0.09	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	29	0.06	0.08	-0.01
			Max. Vx	29	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	10	0.91	0.01	-0.00
			Max. Compression	10	-0.91	0.00	0.00
			Max. Mx	31	-0.34	0.05	0.00
			Max. My	29	0.12	0.05	0.00
			Max. Vy	31	-0.04	0.05	0.00
			Max. Vx	30	-0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	7	68.97	-0.10	-0.01
			Max. Compression	10	-83.29	0.23	-0.01
			Max. Mx	11	-81.26	0.23	-0.01
			Max. My	12	-5.05	-0.01	-0.22
			Max. Vy	14	0.09	-0.22	-0.01
			Max. Vx	12	0.10	-0.01	-0.22
		Diagonal	Max Tension	12	5.70	0.00	0.00
			Max. Compression	12	-5.72	0.00	0.00
			Max. Mx	29	0.72	0.11	-0.01
			Max. My	31	0.15	0.10	0.02
			Max. Vy	29	0.08	0.11	-0.01
			Max. Vx	31	0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	7	93.93	-0.40	-0.01
			Max. Compression	10	-112.12	0.44	0.02
			Max. Mx	37	-14.23	-0.61	-0.01
			Max. My	4	-10.06	0.01	-0.30
			Max. Vy	37	0.17	-0.61	-0.01
			Max. Vx	10	-0.09	-0.12	0.26
		Diagonal	Max Tension	12	6.19	0.00	0.00
			Max. Compression	12	-6.30	0.00	0.00
			Max. Mx	27	1.13	0.16	0.02
			Max. My	31	0.67	0.13	0.02
			Max. Vy	29	0.09	0.14	-0.02
			Max. Vx	31	0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	7	115.42	-0.64	-0.02
			Max. Compression	10	-137.52	0.79	0.03
			Max. Mx	37	-16.06	-0.95	-0.00
			Max. My	4	-11.05	-0.07	-0.71
			Max. Vy	37	0.19	-0.95	-0.00
			Max. Vx	4	-0.15	-0.07	-0.71
		Diagonal	Max Tension	24	7.09	0.00	0.00
			Max. Compression	12	-7.28	0.00	0.00
			Max. Mx	29	0.47	0.21	-0.03
			Max. My	30	-0.97	0.19	0.03
			Max. Vy	29	0.11	0.20	0.03
			Max. Vx	30	0.01	0.00	0.00
T10	20 - 10	Leg	Max Tension	7	126.92	0.14	-0.02
			Max. Compression	10	-151.32	-0.38	-0.01
			Max. Mx	37	-13.95	-0.95	-0.00
			Max. My	4	-13.18	-0.15	-1.14
			Max. Vy	37	-0.22	-0.95	-0.00
			Max. Vx	4	0.19	-0.15	-1.14
		Diagonal	Max Tension	12	7.29	0.00	0.00
			Max. Compression	24	-7.37	0.00	0.00
			Max. Mx	29	0.09	0.30	-0.03
			Max. My	29	-2.18	0.27	-0.04
			Max. Vy	29	0.13	0.30	-0.03
			Max. Vx	29	-0.01	0.00	0.00
T11	10 - 0	Leg	Max Tension	7	137.36	0.14	-0.02
			Max. Compression	10	-163.52	0.00	-0.00
			Max. Mx	10	-163.36	1.41	-0.00
			Max. My	4	-13.60	-0.15	-1.14
			Max. Vy	10	-0.40	1.41	-0.00
			Max. Vx	4	-0.27	-0.15	-1.14
		Diagonal	Max Tension	25	7.27	0.11	0.01
			Max. Compression	12	-7.77	0.00	0.00
			Max. Mx	30	1.62	0.22	-0.04
			Max. My	31	1.96	0.21	0.04
			Max. Vy	30	0.12	0.21	0.04
			Max. Vx	31	-0.01	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Secondary Horizontal	Max Tension	10	2.84	0.04	-0.00
			Max. Compression	10	-2.84	0.00	0.00
			Max. Mx	28	0.88	0.14	0.01
			Max. My	30	-0.14	0.13	0.01
			Max. Vy	28	0.08	0.14	0.01
			Max. Vx	30	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	166.56	17.34	-9.91
	Max. H_x	18	166.56	17.34	-9.91
	Max. H_z	7	-142.84	-15.14	8.64
	Min. Vert	7	-142.84	-15.14	8.64
	Min. H_x	7	-142.84	-15.14	8.64
	Min. H_z	18	166.56	17.34	-9.91
Leg B	Max. Vert	10	170.14	-17.25	-10.30
	Max. H_x	23	-140.84	14.98	8.92
	Max. H_z	25	-122.15	12.42	8.98
	Min. Vert	23	-140.84	14.98	8.92
	Min. H_x	10	170.14	-17.25	-10.30
	Min. H_z	10	170.14	-17.25	-10.30
Leg A	Max. Vert	2	167.81	0.40	19.88
	Max. H_x	20	13.13	2.64	0.99
	Max. H_z	2	167.81	0.40	19.88
	Min. Vert	15	-139.03	-0.32	-17.25
	Min. H_x	9	9.52	-2.58	0.69
	Min. H_z	15	-139.03	-0.32	-17.25

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	30.13	-0.00	0.00	-12.44	-24.41	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	36.15	-0.03	-32.19	-2532.07	-26.60	12.01
0.9 Dead+1.6 Wind 0 deg - No Ice	27.11	-0.03	-32.18	-2525.16	-19.23	11.98
1.2 Dead+1.6 Wind 30 deg - No Ice	36.15	15.76	-26.99	-2140.47	-1275.80	7.89
0.9 Dead+1.6 Wind 30 deg - No Ice	27.11	15.75	-26.98	-2134.03	-1266.78	7.87
1.2 Dead+1.6 Wind 60 deg - No Ice	36.15	26.83	-15.27	-1221.46	-2158.93	2.49
0.9 Dead+1.6 Wind 60 deg - No Ice	27.11	26.82	-15.27	-1216.12	-2148.78	2.49
1.2 Dead+1.6 Wind 90 deg - No Ice	36.15	31.59	0.04	-11.68	-2528.00	-3.46
0.9 Dead+1.6 Wind 90 deg - No Ice	27.11	31.58	0.04	-7.85	-2517.44	-3.44
1.2 Dead+1.6 Wind 120 deg - No Ice	36.15	28.24	16.13	1246.74	-2247.58	-8.95
0.9 Dead+1.6 Wind 120 deg - No Ice	27.11	28.23	16.13	1248.93	-2237.43	-8.92
1.2 Dead+1.6 Wind 150 deg - No Ice	36.15	15.83	27.06	2115.52	-1281.66	-11.57
0.9 Dead+1.6 Wind 150 deg	27.11	15.83	27.05	2116.53	-1272.75	-11.54

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
- No Ice 1.2 Dead+1.6 Wind 180 deg	36.15	0.03	30.65	2406.40	-32.22	-11.03
- No Ice 0.9 Dead+1.6 Wind 180 deg	27.11	0.03	30.64	2407.01	-24.84	-11.00
- No Ice 1.2 Dead+1.6 Wind 210 deg	36.15	-15.76	27.01	2112.11	1217.09	-7.72
- No Ice 0.9 Dead+1.6 Wind 210 deg	27.11	-15.76	27.01	2113.14	1222.93	-7.70
- No Ice 1.2 Dead+1.6 Wind 240 deg	36.15	-28.17	16.07	1241.37	2183.64	-2.59
- No Ice 0.9 Dead+1.6 Wind 240 deg	27.11	-28.16	16.07	1243.57	2188.25	-2.60
- No Ice 1.2 Dead+1.6 Wind 270 deg	36.15	-31.56	-0.03	-17.48	2467.82	3.61
- No Ice 0.9 Dead+1.6 Wind 270 deg	27.11	-31.56	-0.03	-13.64	2472.00	3.59
- No Ice 1.2 Dead+1.6 Wind 300 deg	36.15	-26.87	-15.34	-1227.36	2103.27	8.55
- No Ice 0.9 Dead+1.6 Wind 300 deg	27.11	-26.86	-15.34	-1222.01	2107.86	8.52
- No Ice 1.2 Dead+1.6 Wind 330 deg	36.15	-15.82	-27.04	-2144.73	1222.35	11.68
- No Ice 0.9 Dead+1.6 Wind 330 deg	27.11	-15.82	-27.04	-2138.27	1228.05	11.64
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	133.60	-0.00	0.00	-58.25	-140.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	133.60	-0.01	-7.39	-640.74	-140.06	2.67
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	133.60	3.64	-6.29	-556.07	-429.07	1.49
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	133.60	6.30	-3.61	-344.58	-639.87	-0.02
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	133.60	7.30	0.01	-57.51	-718.88	-1.49
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	133.60	6.43	3.70	233.52	-648.12	-2.62
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	133.60	3.66	6.30	440.05	-430.49	-3.01
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	133.60	0.01	7.25	515.49	-141.71	-2.58
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	133.60	-3.64	6.29	439.10	147.15	-1.47
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	133.60	-6.41	3.69	231.84	364.86	0.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	133.60	-7.30	-0.01	-59.24	436.56	1.52
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	133.60	-6.31	-3.63	-346.01	358.72	2.59
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	133.60	-3.66	-6.30	-556.79	148.70	3.03
Dead+Wind 0 deg - Service	30.13	-0.01	-7.86	-626.38	-23.78	2.93
Dead+Wind 30 deg - Service	30.13	3.85	-6.59	-530.87	-328.45	1.92
Dead+Wind 60 deg - Service	30.13	6.55	-3.73	-306.73	-543.84	0.61
Dead+Wind 90 deg - Service	30.13	7.71	0.01	-11.67	-633.86	-0.84
Dead+Wind 120 deg - Service	30.13	6.89	3.94	295.26	-565.46	-2.18
Dead+Wind 150 deg - Service	30.13	3.86	6.60	507.15	-329.88	-2.82
Dead+Wind 180 deg - Service	30.13	0.01	7.48	578.09	-25.15	-2.69
Dead+Wind 210 deg - Service	30.13	-3.85	6.59	506.32	279.55	-1.88
Dead+Wind 240 deg - Service	30.13	-6.88	3.92	293.95	515.28	-0.63
Dead+Wind 270 deg - Service	30.13	-7.70	-0.01	-13.08	584.59	0.88
Dead+Wind 300 deg - Service	30.13	-6.56	-3.74	-308.16	495.68	2.08
Dead+Wind 330 deg -	30.13	-3.86	-6.60	-531.90	280.83	2.85

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
Service						

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-30.13	0.00	0.00	30.13	-0.00	0.000%
2	-0.03	-36.15	-32.19	0.03	36.15	32.19	0.009%
3	-0.03	-27.11	-32.19	0.03	27.11	32.18	0.025%
4	15.76	-36.15	-26.99	-15.76	36.15	26.99	0.010%
5	15.76	-27.11	-26.99	-15.75	27.11	26.98	0.027%
6	26.84	-36.15	-15.27	-26.83	36.15	15.27	0.010%
7	26.84	-27.11	-15.27	-26.82	27.11	15.27	0.029%
8	31.59	-36.15	0.04	-31.59	36.15	-0.04	0.010%
9	31.59	-27.11	0.04	-31.58	27.11	-0.04	0.028%
10	28.24	-36.15	16.14	-28.24	36.15	-16.13	0.009%
11	28.24	-27.11	16.14	-28.23	27.11	-16.13	0.025%
12	15.83	-36.15	27.06	-15.83	36.15	-27.06	0.009%
13	15.83	-27.11	27.06	-15.83	27.11	-27.05	0.027%
14	0.03	-36.15	30.66	-0.03	36.15	-30.65	0.010%
15	0.03	-27.11	30.66	-0.03	27.11	-30.64	0.029%
16	-15.76	-36.15	27.02	15.76	36.15	-27.01	0.009%
17	-15.76	-27.11	27.02	15.76	27.11	-27.01	0.027%
18	-28.17	-36.15	16.07	28.17	36.15	-16.07	0.009%
19	-28.17	-27.11	16.07	28.16	27.11	-16.07	0.025%
20	-31.57	-36.15	-0.03	31.56	36.15	0.03	0.009%
21	-31.57	-27.11	-0.03	31.56	27.11	0.03	0.027%
22	-26.87	-36.15	-15.34	26.87	36.15	15.34	0.010%
23	-26.87	-27.11	-15.34	26.86	27.11	15.34	0.029%
24	-15.82	-36.15	-27.05	15.82	36.15	27.04	0.009%
25	-15.82	-27.11	-27.05	15.82	27.11	27.04	0.027%
26	0.00	-133.60	0.00	0.00	133.60	-0.00	0.003%
27	-0.01	-133.60	-7.39	0.01	133.60	7.39	0.001%
28	3.64	-133.60	-6.29	-3.64	133.60	6.29	0.001%
29	6.30	-133.60	-3.62	-6.30	133.60	3.61	0.001%
30	7.30	-133.60	0.01	-7.30	133.60	-0.01	0.001%
31	6.43	-133.60	3.70	-6.43	133.60	-3.70	0.001%
32	3.66	-133.60	6.31	-3.66	133.60	-6.30	0.003%
33	0.01	-133.60	7.25	-0.01	133.60	-7.25	0.003%
34	-3.64	-133.60	6.30	3.64	133.60	-6.29	0.002%
35	-6.42	-133.60	3.69	6.41	133.60	-3.69	0.002%
36	-7.30	-133.60	-0.01	7.30	133.60	0.01	0.002%
37	-6.31	-133.60	-3.63	6.31	133.60	3.63	0.003%
38	-3.66	-133.60	-6.30	3.66	133.60	6.30	0.003%
39	-0.01	-30.13	-7.86	0.01	30.13	7.86	0.010%
40	3.85	-30.13	-6.59	-3.85	30.13	6.59	0.010%
41	6.55	-30.13	-3.73	-6.55	30.13	3.73	0.010%
42	7.71	-30.13	0.01	-7.71	30.13	-0.01	0.010%
43	6.90	-30.13	3.94	-6.89	30.13	-3.94	0.010%
44	3.87	-30.13	6.61	-3.86	30.13	-6.60	0.010%
45	0.01	-30.13	7.48	-0.01	30.13	-7.48	0.009%
46	-3.85	-30.13	6.60	3.85	30.13	-6.59	0.009%
47	-6.88	-30.13	3.92	6.88	30.13	-3.92	0.009%
48	-7.71	-30.13	-0.01	7.70	30.13	0.01	0.009%
49	-6.56	-30.13	-3.75	6.56	30.13	3.74	0.010%
50	-3.86	-30.13	-6.60	3.86	30.13	6.60	0.010%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	6	0.00000001	0.00005768
2	Yes	7	0.00000001	0.00047557
3	Yes	6	0.00036630	0.00075641
4	Yes	7	0.00000001	0.00050763
5	Yes	6	0.00040013	0.00082515
6	Yes	7	0.00000001	0.00053536
7	Yes	6	0.00042896	0.00088397
8	Yes	7	0.00000001	0.00050701
9	Yes	6	0.00039951	0.00082382
10	Yes	7	0.00000001	0.00047489
11	Yes	6	0.00036589	0.00075527
12	Yes	7	0.00000001	0.00050401
13	Yes	6	0.00039750	0.00081918
14	Yes	7	0.00000001	0.00053338
15	Yes	6	0.00042797	0.00088117
16	Yes	7	0.00000001	0.00050496
17	Yes	6	0.00039812	0.00082070
18	Yes	7	0.00000001	0.00047454
19	Yes	6	0.00036555	0.00075496
20	Yes	7	0.00000001	0.00050694
21	Yes	6	0.00039942	0.00082407
22	Yes	7	0.00000001	0.00053530
23	Yes	6	0.00042889	0.00088410
24	Yes	7	0.00000001	0.00050652
25	Yes	6	0.00039938	0.00082372
26	Yes	6	0.00000001	0.00064188
27	Yes	8	0.00000001	0.00035003
28	Yes	8	0.00000001	0.00036744
29	Yes	8	0.00000001	0.00037339
30	Yes	8	0.00000001	0.00036441
31	Yes	8	0.00000001	0.00034353
32	Yes	7	0.00000001	0.00089996
33	Yes	7	0.00000001	0.00078126
34	Yes	7	0.00000001	0.00067296
35	Yes	7	0.00000001	0.00064373
36	Yes	7	0.00000001	0.00070065
37	Yes	7	0.00000001	0.00081694
38	Yes	7	0.00000001	0.00092955
39	Yes	6	0.00000001	0.00083755
40	Yes	6	0.00000001	0.00085345
41	Yes	6	0.00000001	0.00086680
42	Yes	6	0.00000001	0.00085306
43	Yes	6	0.00000001	0.00083527
44	Yes	6	0.00000001	0.00084027
45	Yes	6	0.00000001	0.00084908
46	Yes	6	0.00000001	0.00083516
47	Yes	6	0.00000001	0.00082468
48	Yes	6	0.00000001	0.00084191
49	Yes	6	0.00000001	0.00085750
50	Yes	6	0.00000001	0.00084657

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	132	Diagonal	A325N	0.63	1	1.19	6.10	0.195 ✔	1	Member Block Shear
		Top Girt	A325N	0.63	1	0.07	6.83	0.011 ✔	1	Member Block Shear
T2	124	Leg	A325N	0.63	4	0.80	20.71	0.039 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.04	6.10	0.170 ✔	1	Member Block Shear
T3	120	Leg	A325N	0.75	4	4.71	29.82	0.158 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	3.73	7.12	0.524 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T4	100	Diagonal	A325N	0.63	1	4.42	8.48	0.521 ✔	1	Member Bearing
T5	93.3333	Diagonal	A325N	0.63	1	4.57	8.48	0.538 ✔	1	Member Bearing
T6	86.6667	Leg	A325N	0.88	4	10.51	40.59	0.259 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.51	8.48	0.650 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	0.91	4.79	0.191 ✔	1	Member Block Shear
T7	80	Leg	A325N	0.88	4	17.24	40.59	0.425 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.70	8.48	0.672 ✔	1	Member Bearing
T8	60	Leg	A325N	1.00	4	23.48	53.01	0.443 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	6.19	9.51	0.651 ✔	1	Member Bearing
T9	40	Leg	A325N	1.00	4	28.86	53.01	0.544 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	7.28	12.43	0.586 ✔	1	Bolt Shear
T10	20	Diagonal	A325N	0.75	1	7.29	12.19	0.598 ✔	1	Member Bearing
T11	10	Diagonal	A325N	0.75	1	7.27	12.19	0.597 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	2.84	7.83	0.362 ✔	1	Member Bearing

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	132 - 124	ROHN 2 STD	8.00	4.00	61.0 K=1.00	1.07	-3.63	36.84	0.099 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0 K=1.00	1.07	-4.78	36.84	0.130 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4 K=1.00	1.70	-25.88	57.13	0.453 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-33.96	70.89	0.479 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-43.03	70.89	0.607 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5 K=1.00	2.23	-52.70	91.43	0.576 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5 K=1.00	5.47	-83.29	160.27	0.520 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3 K=1.00	4.41	-112.12	159.91	0.701 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4 K=1.00	6.11	-137.52	201.25	0.683 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4 K=1.00	6.11	-151.32	201.25	0.752 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6 K=1.00	6.11	-163.52	253.28	0.646 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	126.9 K=1.00	0.62	-1.15	8.62	0.133 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	127.1 K=1.00	0.62	-1.07	8.59	0.125 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	145.8 K=1.00	0.71	-3.79	7.60	0.498 [1] ✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	133.6 K=1.00	0.90	-4.46	11.42	0.390 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	140.1 K=1.00	0.90	-4.59	10.38	0.443 [1] ✔
T6	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	149.9 K=1.00	0.90	-5.71	9.07	0.629 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	168.5 K=1.00	0.90	-5.72	7.17	0.798 [1] ✔
T8	60 - 40	L3x3x3/16	15.90	7.80	157.1 K=1.00	1.09	-6.30	9.97	0.631 [1] ✔
T9	40 - 20	L3x3x1/4	19.10	9.45	191.5 K=1.00	1.44	-7.28	8.87	0.821 [1] ✔
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	170.6 K=1.00	1.69	-7.37	13.12	0.562 [1] ✔
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	180.4 K=1.00	1.69	-7.77	11.73	0.663 [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 $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	10.05	132.1 K=0.50	0.53	-0.91	6.82	0.134 [1] ✔
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	17.79	137.2 K=0.50	0.90	-2.84	10.82	0.262 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L2x2x3/16	6.60	6.17	187.8 K=1.00	0.71	-0.07	4.58	0.015 [1] ✔
T3	120 - 100	L2x2x3/16	6.65	6.45	167.0 K=0.85	0.71	-0.13	5.79	0.023 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0	1.07	1.33	48.35	0.027 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0	1.07	3.19	48.35	0.066 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4	1.70	18.85	76.68	0.246 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9	2.23	26.14	100.28	0.261 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9	2.23	34.31	100.28	0.342 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5	2.23	42.42	100.28	0.423 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5	5.47	68.97	245.99	0.280 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3	4.41	93.93	198.34	0.474 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4	6.11	115.42	275.04	0.420 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4	6.11	126.92	275.04	0.461 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6	6.11	137.36	275.04	0.499 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	84.0	0.36	1.19	15.68	0.076 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	84.1	0.36	1.04	15.68	0.066 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	95.5	0.43	3.73	18.74	0.199 [1] ✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	86.9	0.57	4.42	24.84	0.178 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	91.1	0.57	4.57	24.84	0.184 [1] ✔
T6	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	95.4	0.57	5.51	24.84	0.222 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	109.2	0.57	5.70	24.84	0.229 [1] ✔
T8	60 - 40	L3x3x3/16	15.90	7.80	101.3	0.71	6.19	34.71	0.178 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3x3x1/4	19.10	9.45	123.5	0.94	7.09	45.79	0.155 [1] ✔
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	110.1	1.10	7.29	53.79	0.136 [1] ✔
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	114.9	1.10	7.27	53.79	0.135 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	10.05	264.1	0.29	0.91	12.62	0.072 [1] ✔
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	17.79	274.5	0.57	2.84	24.84	0.114 [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	132 - 124	L2x2x3/16	6.60	6.17	124.6	0.43	0.07	18.74	0.004 [1] ✔
T3	120 - 100	L2x2x3/16	6.65	6.45	125.4	0.71	0.21	23.17	0.009 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

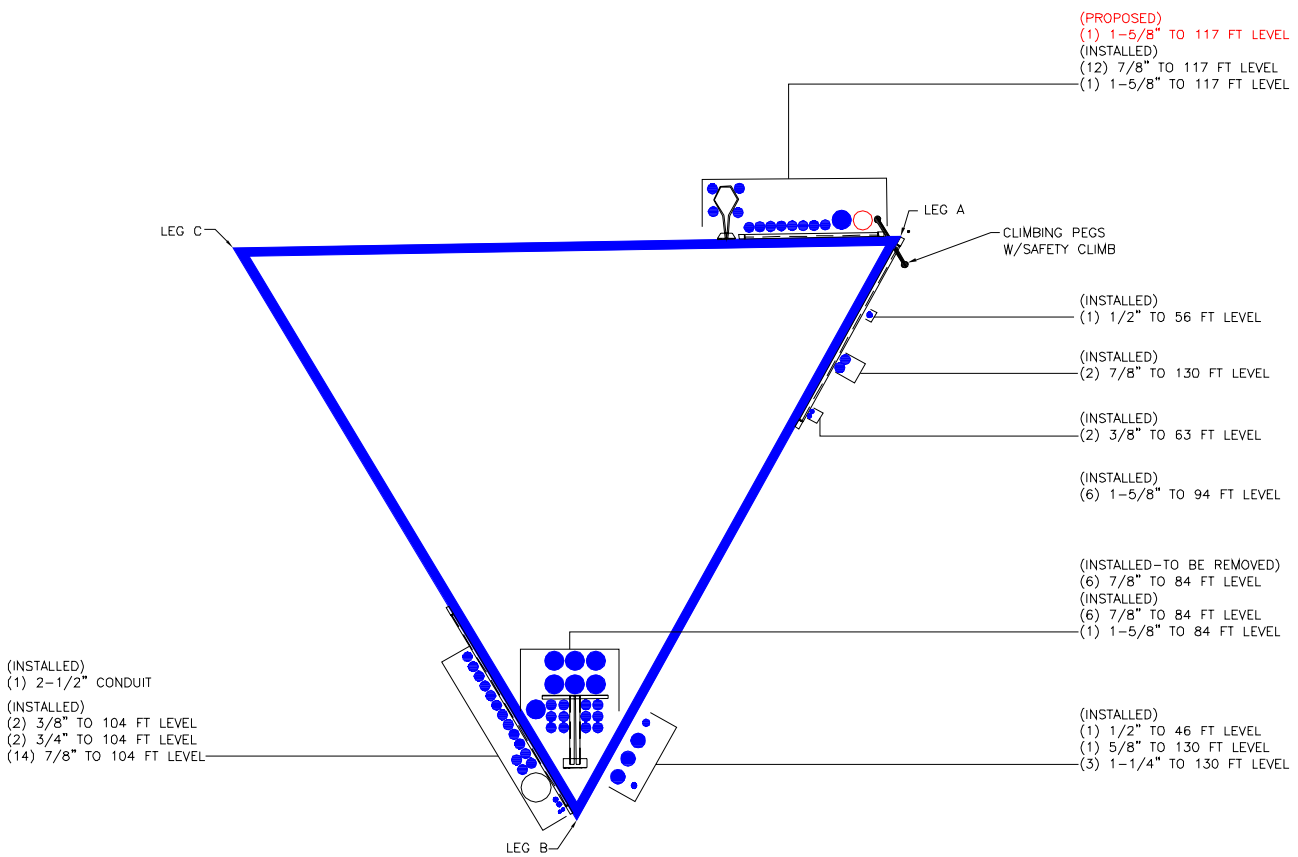
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.63	36.84	9.9	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.78	36.84	13.0	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-25.88	57.13	45.3	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-33.96	70.89	47.9	Pass
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	68	-43.03	70.89	60.7	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	77	-52.70	91.43	57.6	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-83.29	160.27	52.0	Pass
T8	60 - 40	Leg	ROHN 4 X-STR	110	-112.12	159.91	70.1	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-137.52	201.25	68.3	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-151.32	201.25	75.2	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-163.52	253.28	64.6	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.15	8.62	13.3 19.5 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.07	8.59	12.5 17.0 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	120 - 100	Diagonal	L2x2x3/16	36	-3.79	7.60	49.8 52.4 (b)	Pass
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	63	-4.46	11.42	39.0 52.1 (b)	Pass
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	72	-4.59	10.38	44.3 53.8 (b)	Pass
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-5.71	9.07	62.9 65.0 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-5.72	7.17	79.8	Pass
T8	60 - 40	Diagonal	L3x3x3/16	114	-6.30	9.97	63.1 65.1 (b)	Pass
T9	40 - 20	Diagonal	L3x3x1/4	135	-7.28	8.87	82.1	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-7.37	13.12	56.2 59.8 (b)	Pass
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	159	-7.77	11.73	66.3	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	85	-0.91	6.82	13.4 19.1 (b)	Pass
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	164	-2.84	10.82	26.2 36.2 (b)	Pass
T1	132 - 124	Top Girt	L2x2x3/16	6	-0.07	4.58	1.5	Pass
T3	120 - 100	Top Girt	L2x2x3/16	33	-0.13	5.79	2.3	Pass

Summary	ELC:	
Leg (T10)	75.2	Pass
Diagonal (T9)	82.1	Pass
Secondary Horizontal (T11)	36.2	Pass
Top Girt (T3)	2.3	Pass
Bolt Checks	67.2	Pass
Rating =	82.1	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806377 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
BU#:	**806377**
Site Name:	**HRT 084 943242**
App #:	**365116 Rev. 0**

Anchor Rod Data		
Qty:	**4**	
Diam:	**1**	in
Rod Material:	**A449 (1/4 to 1 Incl.)**	
Strength (Fu):	120	ksi
Yield (Fy):	92	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

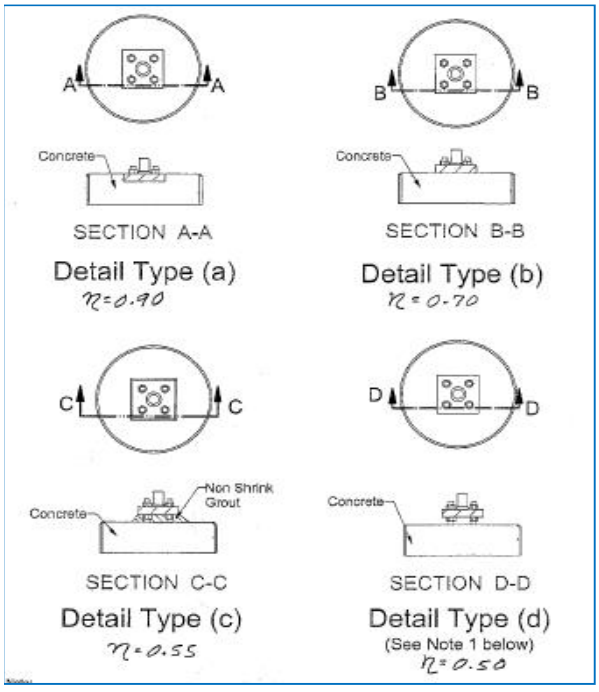


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**143**	kips
Shear, Vu:	**17**	kips

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ή):	43.5	Kips
Design Axial, Φ*Fu*Anet:	58.2	Kips
Anchor Rod Stress Ratio:	74.7%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**74.7%**	**Pass**

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *806377*
Site Name: *HRT 084 943242*
App #: *365116 Rev. 0*

Loads Already Factored		
For P (DL)	1.2	<----Disregard
For P,V, and M (WL)	1.35	<----Disregard

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	27.6	in
Pad Bearing Depth, D:	4.2	ft
Pad Thickness, T:	4.2	ft
Pad Width=Length, L:	24	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	3.3	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	10.89	ft^2
Pier Height:	2.30	ft
Soil (above pad) Height:	0.00	ft

Soil Parameters		
Unit Weight, γ:	115.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	33.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	3.39	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	33.0	kips
Pad Force Location Above D:	1.40	ft
ϕ(Passive Pressure Moment):	46.20	ft-kips
Factored O.T. M(WL), "1.6W":	2792.8	ft-kips
Factored OT (MW-Msoil), M1	2746.55	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	366.6	kips
Unfactored (Total ftg-soil Wt):	366.64	kips
1.2D. **No Soil Wedges**.	475.96	kips
0.9D. **With Soil Wedges**	356.97	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	G	<--Pull Down
Factored DL Axial, PDu:	36	kips
Factored WL Axial, PWu:	0	kips
Factored WL Shear, Vu:	33	kips
Factored WL Moment, Mu:	2570	ft-kips

Load Factor	Shaft Factored Loads		
1.00	1.2D+1.6W, Pu:	36	kips
0.90	0.9D+1.6W, Pu:	27	kips
1.00	Vu:	33	kips
	Mu:	2570	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	475.96	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	2746.55	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	5.77	ft
Orthogonal qu=	1.62	ksf
qu/ϕ*qn Ratio=	**7.20%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	4.08	ft
Diagonal qu=	1.90	ksf
qu/ϕ*qn Ratio=	**8.43%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	356.97	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	2746.55	ft-kips

Orthogonal ecc3 = M2/P2 =	7.69	ft
Ortho Non Bearing Length,NBL=	15.39	ft
Orthogonal qu=	1.73	ksf
Diagonal qu=	2.07	ksf

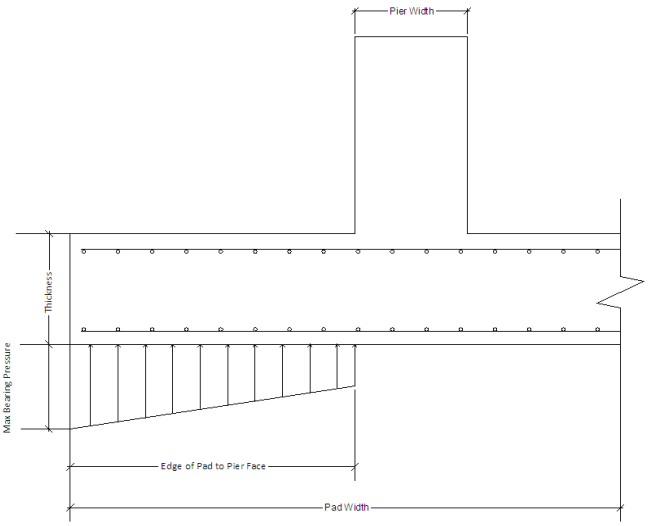
Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2570.00		
M Orthogonal:	3989.14	**64.42%**	**Pass**
M Diagonal:	3989.14	**64.42%**	**Pass**

Monopole or Self Support Pad Foundation Reinforcing
BU#: 806377
SSOE Project Number: 017-00013-00

Analysis Code	G
Compression	170 k
Uplift	143 k
Shear	20 k

Structural Capacity	19.4%	OK

Pad Geometry & Reinforcing	
Pad Length	24 ft
Pad Width	24 ft
Pad Thickness	4.2 ft
Pad Top Rebar Size	# 8
Pad Top Rebar Quantity	24
Pad Bottom Rebar Size	# 8
Pad Bottom Rebar Quantity	24
Clear Cover	3 in
f_c'	3 ksi
Rebar Fy	60 ksi
Minimum Steel Assumed?	NO
Pier Shape	Square
Pier Rebar Size	# 9
Pier Rebar Quantity	16
Pier Width	3.3 ft
Pier Height	2.3 ft
Anchor Rod Circle	9.5 in
Anchor Rod Embedment	66.5 in
Pier Tie Size	# 5



Bearing Calculation	
Max Bearing Pressure	1.73 ksf
Edge of Pad to Pier Face	2.20833 ft
Clear Distance Between Piers	15.5 ft
ecc3 (From Crown Spreadsheet)	7.69
Non-Bearing Length	15.38 ft

Structural Calculations		
Minimum Reinforcement Check		
Pad - A_s Min Met?	Yes	
Pier - A_s Min Met?	Yes	
Punching Shear		
φ (Shear) =	0.75	
V_u =	120.92 k	
ϕV_c =	2622.76 k	
Shear Capacity	4.6%	OK
Pad Flexure		
φ (Tension) =	0.9	
M_u	3.86 k-ft	
ϕM_n =	162.20 k-ft	
Moment Capacity	2.4%	OK
Beam Shear		
V_u	3.33 k	
ϕV_n =	45.75 k	
Shear Capacity	7.3%	OK
Pier Compression		
P_u	170 k	
ϕP_n =	3401.29 k	
Compression Capacity	5.0%	OK
Pier Tension		
P_u =	143.00 k	
ϕP_n =	736.13 k	
Tension Capacity =	19.4%	OK
Pier Interface		
P_u =	819.21824 k	
ϕP_n =	7997.616 k	
Interface Capacity =	10.2%	OK