Date: **July 8, 2021**

NC LIC# P-1403

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Site Number:	5RA0884A
	Site Name:	N/A
Crown Castle Designation:	**BU Number:**	879743
	Site Name:	(P3) Erwin/McLamb (F1)
	JDE Job Number:	631410
	Work Order Number:	1988834
	Order Number:	540848 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	148377.565498
Site Data:	**926 S. 13th Street, Erwin, Harnett County, NC 28339** **Latitude *35° 19' 3.65"*, Longitude *-78° 41' 13.67"*** **250 Foot - Self-Supporting Tower**	

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC5: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2018 North Carolina State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Jonathan C. McGinnis, E.I. / BHM

Respectfully submitted by:

Luke Meadows, P.E.

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1) INTRODUCTION

This tower is a 250-ft self-supporting tower designed by Rohn. The tower has been modified per reinforcement drawings prepared by GDP Group in January of 2014.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	30 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
246.0	248.0	3	Ericsson	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	3	1-5/8
		3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	Ericsson	RADIO 4449 B71 B85A_ T-MOBILE		
		3	Ericsson	RADIO 4415 B25_TMO		
	246.0	3	Perfect Vision	PV-SFA-12-3-96		

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)
237.0	238.0	6	Commscope	SBNHH-1D65C	3 4 12	3/8 3/4 2-1/4
		3	Cci Antennas	TPA65R-BU8D		
		3	Ericsson	RRUS-11		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RADIO 8843 B2/B66A		
		6	RFS Celwave	ATM192012-0		
		2	Raycap	DC6-48-60-18-8F		
	237.0	1	Tower Mounts	Sector Mount [SM 1303-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	1575212	CCISites
Tower Foundation Drawings	1486060	CCISites
Tower Manufacturer Drawings	2115835	CCISites
Tower Reinforcement Drawings	4349928	CCISites
Post-Modification Inspection	4967597	CCISites

3.1) Analysis Method

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

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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)	ϕP_{allow} (k)	% Capacity	Pass / Fail
T1	250 - 240	Leg	ROHN 2.5 STD	3	-6.44	60.05	10.7	Pass
T2	240 - 236	Leg	ROHN 2.5 STD	21	-14.31	66.74	21.4	Pass
T3	236 - 232	Leg	ROHN 2.5 STD	30	-22.69	66.74	34.0	Pass
T4	232 - 228	Leg	ROHN 2.5 STD	39	-33.77	66.74	50.6	Pass
T5	228 - 224	Leg	ROHN 2.5 STD	48	-45.19	66.74	67.7	Pass
T6	224 - 220	Leg	ROHN 2.5 STD	57	-56.69	66.74	84.9	Pass
T7	220 - 200	Leg	ROHN 3 EH	66	-92.91	125.02	74.3	Pass
T8	200 - 180	Leg	ROHN 3.5 EH	99	-120.83	148.90	81.1	Pass
T9	180 - 160	Leg	ROHN 4 EH	126	-145.87	167.90	86.9	Pass
T10	160 - 140	Leg	ROHN 5 EH	147	-171.67	251.34	68.3 70.8 (b)	Pass
T11	140 - 120	Leg	ROHN 5 EH	168	-198.64	251.36	79.0	Pass
T12	120 - 100	Leg	ROHN 6 EH	189	-223.13	318.91	70.0	Pass
T13	100 - 80	Leg	ROHN 6 EH	204	-250.86	318.94	78.7	Pass
T14	80 - 60	Leg	ROHN 8 EHS	219	-277.49	405.68	68.4	Pass
T15	60 - 40	Leg	ROHN 8 EHS	234	-305.68	405.73	75.3	Pass
T16	40 - 20	Leg	ROHN 8 EHS	249	-333.60	405.69	82.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
T17	20 - 0	Leg	ROHN 8 EH	264	-341.73	530.68	64.4	Pass
T1	250 - 240	Diagonal	L1 1/2x1 1/2x3/16	10	-2.42	9.80	24.7 45.8 (b)	Pass
T2	240 - 236	Diagonal	L1 1/2x1 1/2x3/16	24	-2.71	11.61	23.3 52.4 (b)	Pass
T3	236 - 232	Diagonal	L1 1/2x1 1/2x3/16	33	-4.68	11.89	39.4 65.1 (b)[3]	Pass
T4	232 - 228	Diagonal	L1 1/2x1 1/2x3/16	43	-4.95	11.89	41.7 67.6 (b)[3]	Pass
T5	228 - 224	Diagonal	L1 1/2x1 1/2x3/16	54	-5.25	11.89	44.2 72.8 (b)[3]	Pass
T6	224 - 220	Diagonal	L1 1/2x1 1/2x3/16	62	-5.80	11.89	48.8 77.4 (b)[3]	Pass
T7	220 - 200	Diagonal	L1 1/2x1 1/2x3/16	72	-3.67	7.19	51.1 68.7 (b)	Pass
T8	200 - 180	Diagonal	L1 3/4x1 3/4x3/16	105	-4.43	6.84	64.8 70.2 (b)	Pass
T9	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	132	-5.61	12.66	44.3 83.7 (b)	Pass
T10	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	153	-6.05	9.68	62.5 94.6 (b)	Pass
T11	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	174	-7.05	9.83	71.7 94.5 (b)	Pass
T12	120 - 100	Diagonal	L3x3x1/4	195	-8.34	11.48	72.7	Pass
T13	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	210	-9.81	15.97	61.4 78.3 (b)	Pass
T14	80 - 60	Diagonal	L3 1/2x3 1/2x1/4	225	-9.47	13.53	70.0	Pass
T15	60 - 40	Diagonal	L4x4x1/4	240	-12.14	17.55	69.2 78.5 (b)	Pass
T16	40 - 20	Diagonal	L4x4x1/4	255	-11.87	14.95	79.4	Pass
T17	20 - 0	Diagonal	ROHN 2.5 STD	285	-16.89	16.97	99.5	Pass
T17	20 - 0	Horizontal	ROHN 2.5 STD	281	-9.59	16.79	57.1	Pass
T1	250 - 240	Top Girt	L1 1/2x1 1/2x3/16	5	-0.41	5.55	7.5 8.8 (b)	Pass
T17	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	267	-1.50	14.44	10.4	Pass
T17	20 - 0	Redund Diag 1 Bracing	ROHN 1.5 STD	284	-0.76	4.40	17.4	Pass
T17	20 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	288	-0.05	12.84	0.4	Pass
T17	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	289	-0.07	11.05	0.7	Pass
T17	20 - 0	Inner Bracing	ROHN 3 STD	294	-0.01	31.26	0.3	Pass
							Summary	
						Leg (T9)	86.9	Pass
						Diagonal (T17)	99.5	Pass
						Horizontal (T17)	57.1	Pass
						Top Girt (T1)	8.8	Pass
						Redund Horz 1 Bracing (T17)	10.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
						Redund Diag 1 Bracing (T17)	17.4	Pass
						Redund Hip 1 Bracing (T17)	0.4	Pass
						Redund Hip Diagonal 1 Bracing (T17)	0.7	Pass
						Inner Bracing (T17)	0.3	Pass
						Bolt Checks	90.1	Pass
						RATING =	**99.5**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	51.6	Pass
1,2	Base Foundation Structural	-	24.9	Pass
1,2	Base Foundation Soil Interaction	-	50.1	Pass

Structure Rating (max from all components) =	99.5%

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5
3) Connection capacity evaluated in separate TNX analysis to account for existing modification.

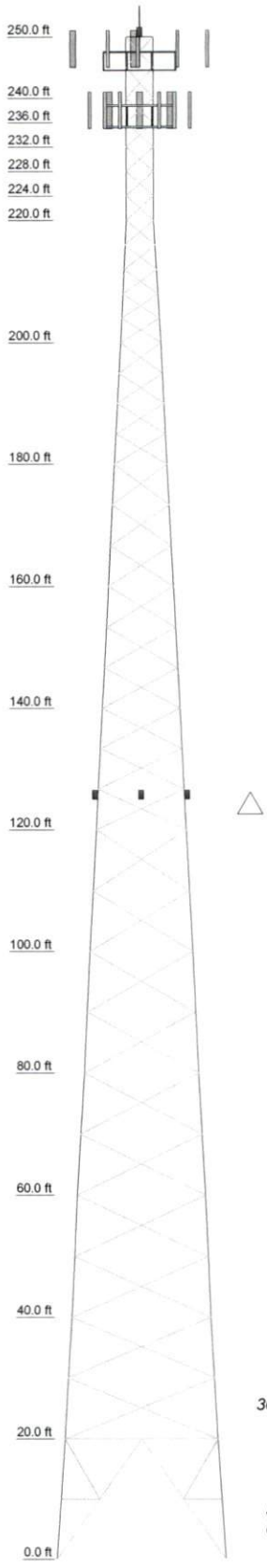
4.1) Recommendations

1) 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	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EH	ROHN 8 EHS			ROHN 6 EH		ROHN 5 EH		ROHN 4 EH	ROHN 3.5 EH	ROHN 3 EH	ROHN 2.5 STD					
Leg Grade	A572-50																
Diagonals	ROHN 2.5 STD	L4x4x1/4		L3 1/2x3 1/2x1/4		L3x3x1/4	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16		L1 3/4x1 3/4x3/16	L1 1/2x1 1/2x3/16						
Diagonal Grade		A572-50					A36										
Top Girts						N.A.						A					
Horizontals	ROHN 2.5 STD						N.A.										
Red. Horizontals	ROHN 1.5 STD						N.A.										
Red. Diagonals	ROHN 1.5 STD						N.A.										
Red. Hips	ROHN 1.5 STD						N.A.										
Inner Bracing	ROHN 3 STD						N.A.										
Face Width (ft)	25.22	23.04	21.11	18.88	16.92	14.83	12.82	10.7	8.63	6.63	4.58						
# Panels @ (ft)	1 @ 20			10 @ 10				9 @ 6.66667		4 @ 5	10 @ 4						2 @ 5
Weight (K)	33.0	5.0	4.3	4.1	3.7	3.3	3.0	2.5	2.1	1.6	1.3	1.0	0.1	0.1	0.1	0.1	0.4



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

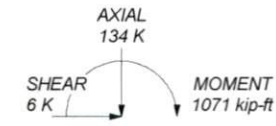
TOWER DESIGN NOTES

1. Tower is located in Harnett County, North Carolina.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 30 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 0.00 ft
8. TOWER RATING: 99.5%

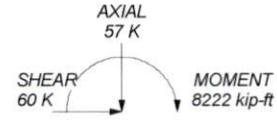
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 361 K
SHEAR: 38 K

UPLIFT: -308 K
SHEAR: 33 K



TORQUE 13 kip-ft
30 mph WIND - 1.5000 in ICE



TORQUE 131 kip-ft
REACTIONS - 119 mph WIND

Tower Engineering Professionals
326 Tryon Rd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350
Tower Engineering Professionals

Job: *(P3) Erwin/McLamb (F1) (BU: 879743)*			
Project: *TEP No. 148377.565498*			
Client: Crown Castle	Drawn by: jcmcginnis	App'd:	
Code: TIA-222-H	Date: 07/08/21	Scale: NTS	
Path:		Dwg No. E-1	

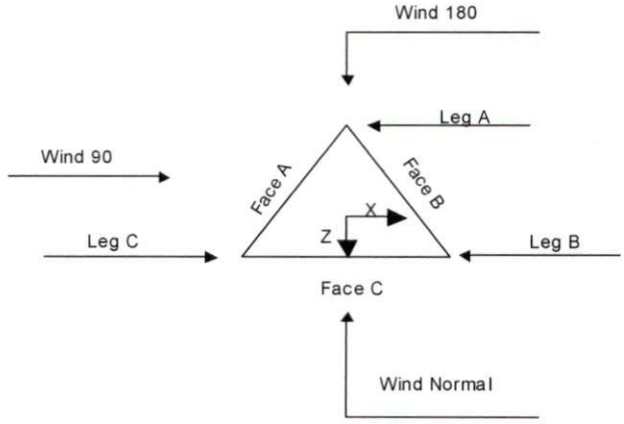
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 250.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.58 ft at the top and 27.80 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Harnett County, North Carolina.
Tower base elevation above sea level: 150.00 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 30 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	250.00-240.00			4.58	1	10.00
T2	240.00-236.00			4.58	1	4.00
T3	236.00-232.00			4.58	1	4.00
T4	232.00-228.00			4.58	1	4.00
T5	228.00-224.00			4.58	1	4.00
T6	224.00-220.00			4.58	1	4.00
T7	220.00-200.00			4.58	1	20.00
T8	200.00-180.00			6.63	1	20.00
T9	180.00-160.00			8.63	1	20.00
T10	160.00-140.00			10.70	1	20.00
T11	140.00-120.00			12.82	1	20.00
T12	120.00-100.00			14.83	1	20.00
T13	100.00-80.00			16.92	1	20.00
T14	80.00-60.00			18.88	1	20.00
T15	60.00-40.00			21.11	1	20.00
T16	40.00-20.00			23.04	1	20.00
T17	20.00-0.00			25.22	1	20.00

Tower Section Geometry *(cont'd)*

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
T1	250.00-240.00	5.00	X Brace	No	No	0.0000	0.0000
T2	240.00-236.00	4.00	X Brace	No	No	0.0000	0.0000
T3	236.00-232.00	4.00	X Brace	No	No	0.0000	0.0000
T4	232.00-228.00	4.00	X Brace	No	No	0.0000	0.0000
T5	228.00-224.00	4.00	X Brace	No	No	0.0000	0.0000
T6	224.00-220.00	4.00	X Brace	No	No	0.0000	0.0000
T7	220.00-200.00	4.00	X Brace	No	No	0.0000	0.0000
T8	200.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T9	180.00-160.00	6.67	X Brace	No	No	0.0000	0.0000
T10	160.00-140.00	6.67	X Brace	No	No	0.0000	0.0000
T11	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T12	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T13	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T14	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T15	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T16	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T17	20.00-0.00	20.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 250.00-240.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 240.00-236.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 236.00-232.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 232.00-228.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 228.00-224.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 224.00-220.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 220.00-200.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 200.00-180.00	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T9 180.00-160.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 160.00-140.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 140.00-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T12 120.00-100.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T13 100.00-80.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T14 80.00-60.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T15 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A572-50 (50 ksi)
T16 40.00-20.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A572-50 (50 ksi)
T17 20.00-0.00	Pipe	ROHN 8 EH	A572-50	Pipe	ROHN 2.5 STD	A572-50

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)			(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 250.00-240.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T17 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	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
T17 20.00-0.00	Solid Round		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T17 20.00-0.00	A572-50 (50 ksi)	Horizontal (1) Diagonal (1) Hip (1) Hip Diagonal (1)	Pipe Pipe Pipe Pipe	ROHN 1.5 STD ROHN 1.5 STD ROHN 1.5 STD ROHN 2.5 STD	1 1 1 1

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 250.00-240.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T2 240.00-236.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T3 236.00-232.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T4 232.00-228.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T5 228.00-224.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T6 224.00-220.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T7 220.00-200.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T8 200.00-180.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T9 180.00-160.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T10 160.00-140.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T11 140.00-120.00	0.00	0.1793	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T12 120.00-100.00	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T13 100.00-80.00	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T14 80.00-60.00	0.00	0.3750	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T15 60.00-40.00	0.00	0.3750	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T16 40.00-20.00	0.00	0.3750	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	36.0000
T17 20.00-0.00	0.00	0.3750	A36 (36 ksi)	1	1.03	1.05	0.0000	0.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft															
T1 250.00-240.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 240.00-236.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 236.00-232.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 232.00-228.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 228.00-224.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1

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
224.00-220.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
220.00-200.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
200.00-180.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T16	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T17	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
250.00-240.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
240.00-236.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
236.00-232.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
232.00-228.00														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
228.00-224.00														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
224.00-220.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
220.00-200.00														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
200.00-180.00														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.00-160.00														

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
T10 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 250.00-240.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 240.00-236.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 236.00-232.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 232.00-228.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 228.00-224.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 224.00-220.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 220.00-200.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 200.00-180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 180.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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
T17 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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	Flange	0.6250	4	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
250.00-240.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T2	Flange	0.7500	0	0.5000	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
240.00-236.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T3	Flange	0.7500	0	0.5000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
236.00-232.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T4	Flange	0.7500	0	0.5000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
232.00-228.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T5	Flange	0.7500	0	0.5000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
228.00-224.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T6	Flange	0.7500	4	0.5000	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
224.00-220.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T7	Flange	0.8750	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
220.00-200.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T8	Flange	0.8750	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
200.00-180.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T9	Flange	1.0000	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	1	0.6250	0
180.00-160.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T10	Flange	1.0000	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T11	Flange	1.0000	6	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-120.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T12	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
120.00-100.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T13	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
100.00-80.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T14	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
80.00-60.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T15	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
60.00-40.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T16	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
40.00-20.00		A325N		A325X		A325X		A325X		A325N		A325X		A325N	
T17 20.00-0.00	Flange	1.0000	0	0.7500	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
		A354-BC		A325X		A325X		A325X		A325N		A325X		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
** Safety Line **													
Safety Line 3/8	B	No	No	Ar (CaAa)	250.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		0.22
FSJ2-50(3/8")	B	No	No	Ar (CaAa)	250.00 - 0.00	-3.0000	0.48	1	1	0.4250	0.4250		0.08
** Step Pegs **													
Step Pegs (5/8" SR) 7-in. w/30" step	A	No	No	Ar (CaAa)	120.00 - 0.00	0.0000	0.5	1	1	0.3500	0.3500		0.49
Step Pegs (5/8" SR) 7-in. w/30" step	B	No	No	Ar (CaAa)	250.00 - 0.00	0.0000	0.5	1	1	0.3500	0.3500		0.49
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	No	Ar (CaAa)	120.00 - 0.00	0.0000	0.5	1	1	0.3500	0.3500		0.49
** Feedline Ladder **													
Feedline Ladder (Af)	A	No	No	Af (CaAa)	237.00 - 0.00	0.0000	0.325	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	246.00 - 0.00	0.0000	-0.325	1	1	3.0000	3.0000		8.40
237													
LDF12-50A(2-1/4")	A	No	No	Ar (CaAa)	237.00 - 0.00	0.0000	0.325	12	6	0.5000	2.3500		1.22
WR-VG86ST-BRD(3/4)	A	No	No	Ar (CaAa)	237.00 - 0.00	0.0000	0.285	4	2	0.5000	0.7740		0.59
860 10014(3/8)	A	No	No	Ar (CaAa)	237.00 - 0.00	2.0000	0.35	1	1	0.3750	0.3750		0.08
FB-L98B-034-XXXXXX(3/8")	A	No	No	Ar (CaAa)	237.00 - 0.00	0.0000	0.265	2	1	0.3937	0.3937		0.05
246													
FXL-1873(1 5/8)	B	No	No	Ar (CaAa)	246.00 - 0.00	0.0000	-0.35	3	3	1.9800	1.9800		0.67
250													
FSJ4-50B(1/2")	B	No	No	Ar (CaAa)	250.00 - 0.00	0.0000	-0.325	1	1	0.5200	0.5200		0.14
******													

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 ft^2/ft	Weight plf
******								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	250.00-240.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	8.234	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.00
T2	240.00-236.00	A	0.000	0.000	3.746	0.000	0.03
		B	0.000	0.000	5.044	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T3	236.00-232.00	A	0.000	0.000	14.983	0.000	0.10
		B	0.000	0.000	5.044	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T4	232.00-228.00	A	0.000	0.000	14.983	0.000	0.10
		B	0.000	0.000	5.044	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T5	228.00-224.00	A	0.000	0.000	14.983	0.000	0.10
		B	0.000	0.000	5.044	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T6	224.00-220.00	A	0.000	0.000	14.983	0.000	0.10
		B	0.000	0.000	5.044	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
T7	220.00-200.00	A	0.000	0.000	74.917	0.000	0.51
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T8	200.00-180.00	A	0.000	0.000	74.917	0.000	0.51
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T9	180.00-160.00	A	0.000	0.000	74.917	0.000	0.51
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T10	160.00-140.00	A	0.000	0.000	74.917	0.000	0.51
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T11	140.00-120.00	A	0.000	0.000	74.917	0.000	0.51
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T12	120.00-100.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01
T13	100.00-80.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01
T14	80.00-60.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01
T15	60.00-40.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01
T16	40.00-20.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01
T17	20.00-0.00	A	0.000	0.000	75.617	0.000	0.52
		B	0.000	0.000	25.220	0.000	0.23
		C	0.000	0.000	0.700	0.000	0.01

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

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	250.00-240.00	A	1.558	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	29.487	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.00
T2	240.00-236.00	A	1.554	0.000	0.000	5.435	0.000	0.10
		B		0.000	0.000	15.865	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T3	236.00-232.00	A	1.551	0.000	0.000	21.727	0.000	0.39
		B		0.000	0.000	15.851	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T4	232.00-228.00	A	1.548	0.000	0.000	21.711	0.000	0.39
		B		0.000	0.000	15.837	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T5	228.00-224.00	A	1.546	0.000	0.000	21.696	0.000	0.39
		B		0.000	0.000	15.823	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T6	224.00-220.00	A	1.543	0.000	0.000	21.680	0.000	0.38
		B		0.000	0.000	15.808	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T7	220.00-200.00	A	1.534	0.000	0.000	108.155	0.000	1.92
		B		0.000	0.000	78.815	0.000	1.13
		C		0.000	0.000	0.000	0.000	0.00
T8	200.00-180.00	A	1.519	0.000	0.000	107.717	0.000	1.90
		B		0.000	0.000	78.410	0.000	1.11
		C		0.000	0.000	0.000	0.000	0.00
T9	180.00-160.00	A	1.502	0.000	0.000	107.236	0.000	1.88
		B		0.000	0.000	77.966	0.000	1.10
		C		0.000	0.000	0.000	0.000	0.00
T10	160.00-140.00	A	1.483	0.000	0.000	106.701	0.000	1.87
		B		0.000	0.000	77.471	0.000	1.09
		C		0.000	0.000	0.000	0.000	0.00
T11	140.00-120.00	A	1.462	0.000	0.000	106.097	0.000	1.85
		B		0.000	0.000	76.914	0.000	1.07
		C		0.000	0.000	0.000	0.000	0.00
T12	120.00-100.00	A	1.438	0.000	0.000	111.856	0.000	1.90
		B		0.000	0.000	76.273	0.000	1.05
		C		0.000	0.000	6.453	0.000	0.07
T13	100.00-80.00	A	1.410	0.000	0.000	110.924	0.000	1.87
		B		0.000	0.000	75.517	0.000	1.03
		C		0.000	0.000	6.338	0.000	0.07
T14	80.00-60.00	A	1.375	0.000	0.000	109.782	0.000	1.83
		B		0.000	0.000	74.592	0.000	1.01
		C		0.000	0.000	6.198	0.000	0.07
T15	60.00-40.00	A	1.329	0.000	0.000	108.299	0.000	1.79
		B		0.000	0.000	73.390	0.000	0.97
		C		0.000	0.000	6.016	0.000	0.06
T16	40.00-20.00	A	1.263	0.000	0.000	106.140	0.000	1.72
		B		0.000	0.000	71.642	0.000	0.93
		C		0.000	0.000	5.752	0.000	0.06
T17	20.00-0.00	A	1.132	0.000	0.000	101.859	0.000	1.60
		B		0.000	0.000	68.175	0.000	0.84
		C		0.000	0.000	5.226	0.000	0.05

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	250.00-240.00	1.8360	-4.4472	4.5252	-3.6554
T2	240.00-236.00	0.5604	-10.1867	3.2258	-8.4609
T3	236.00-232.00	-2.0984	-15.3934	0.4261	-12.7902
T4	232.00-228.00	-2.0984	-15.3934	0.4247	-12.7957
T5	228.00-224.00	-2.0984	-15.3934	0.4232	-12.8014
T6	224.00-220.00	-2.0984	-15.3934	0.4217	-12.8071
T7	220.00-200.00	-2.2502	-17.6569	0.5963	-15.0172
T8	200.00-180.00	-2.5709	-22.0859	0.9102	-19.1785
T9	180.00-160.00	-2.7429	-25.1082	1.1685	-22.7431
T10	160.00-140.00	-2.9814	-28.4494	1.3837	-25.7564
T11	140.00-120.00	-3.2093	-31.6310	1.5777	-28.7698
T12	120.00-100.00	-3.8326	-35.8071	0.1963	-32.4919
T13	100.00-80.00	-3.8361	-36.7075	0.2190	-34.4395
T14	80.00-60.00	-3.9391	-38.1569	0.2262	-36.0125
T15	60.00-40.00	-3.8930	-38.4179	0.2097	-37.3011
T16	40.00-20.00	-4.0390	-40.3275	0.1625	-39.2878
T17	20.00-0.00	-6.3288	-58.8000	0.0174	-49.5380

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	Safety Line 3/8	240.00 - 250.00	0.6000	0.5737
T1	3	FSJ2-50(3/8")	240.00 - 250.00	0.6000	0.5737
T1	6	Step Pegs (5/8" SR) 7-in. w/30" step	240.00 - 250.00	0.6000	0.5737
T1	10	Feedline Ladder (Af)	240.00 - 246.00	0.6000	0.5737
T1	17	FXL-1873(1 5/8)	240.00 - 246.00	0.6000	0.5737
T1	19	FSJ4-50B(1/2")	240.00 - 250.00	0.6000	0.5737
T2	2	Safety Line 3/8	236.00 - 240.00	0.6000	0.5837
T2	3	FSJ2-50(3/8")	236.00 - 240.00	0.6000	0.5837
T2	6	Step Pegs (5/8" SR) 7-in. w/30" step	236.00 - 240.00	0.6000	0.5837
T2	9	Feedline Ladder (Af)	236.00 - 237.00	0.6000	0.5837
T2	10	Feedline Ladder (Af)	236.00 - 240.00	0.6000	0.5837
T2	12	LDF12-50A(2-1/4")	236.00 - 237.00	0.6000	0.5837
T2	13	WR-VG86ST-BRD(3/4)	236.00 - 237.00	0.6000	0.5837
T2	14	860 10014(3/8)	236.00 - 237.00	0.6000	0.5837
T2	15	FB-L98B-034-XXXXXX(3/8")	236.00 - 237.00	0.6000	0.5837
T2	17	FXL-1873(1 5/8)	236.00 - 240.00	0.6000	0.5837
T2	19	FSJ4-50B(1/2")	236.00 -	0.6000	0.5837

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	2	Safety Line 3/8	240.00 232.00 - 236.00	0.6000	0.5841
T3	3	FSJ2-50(3/8")	232.00 - 236.00	0.6000	0.5841
T3	6	Step Pegs (5/8" SR) 7-in. w/30" step	232.00 - 236.00	0.6000	0.5841
T3	9	Feedline Ladder (Af)	232.00 - 236.00	0.6000	0.5841
T3	10	Feedline Ladder (Af)	232.00 - 236.00	0.6000	0.5841
T3	12	LDF12-50A(2-1/4")	232.00 - 236.00	0.6000	0.5841
T3	13	WR-VG86ST-BRD(3/4)	232.00 - 236.00	0.6000	0.5841
T3	14	860 10014(3/8)	232.00 - 236.00	0.6000	0.5841
T3	15	FB-L98B-034-XXXXXX(3/8")	232.00 - 236.00	0.6000	0.5841
T3	17	FXL-1873(1 5/8)	232.00 - 236.00	0.6000	0.5841
T3	19	FSJ4-50B(1/2")	232.00 - 236.00	0.6000	0.5841
T4	2	Safety Line 3/8	228.00 - 232.00	0.6000	0.5845
T4	3	FSJ2-50(3/8")	228.00 - 232.00	0.6000	0.5845
T4	6	Step Pegs (5/8" SR) 7-in. w/30" step	228.00 - 232.00	0.6000	0.5845
T4	9	Feedline Ladder (Af)	228.00 - 232.00	0.6000	0.5845
T4	10	Feedline Ladder (Af)	228.00 - 232.00	0.6000	0.5845
T4	12	LDF12-50A(2-1/4")	228.00 - 232.00	0.6000	0.5845
T4	13	WR-VG86ST-BRD(3/4)	228.00 - 232.00	0.6000	0.5845
T4	14	860 10014(3/8)	228.00 - 232.00	0.6000	0.5845
T4	15	FB-L98B-034-XXXXXX(3/8")	228.00 - 232.00	0.6000	0.5845
T4	17	FXL-1873(1 5/8)	228.00 - 232.00	0.6000	0.5845
T4	19	FSJ4-50B(1/2")	228.00 - 232.00	0.6000	0.5845
T5	2	Safety Line 3/8	224.00 - 228.00	0.6000	0.5849
T5	3	FSJ2-50(3/8")	224.00 - 228.00	0.6000	0.5849
T5	6	Step Pegs (5/8" SR) 7-in. w/30" step	224.00 - 228.00	0.6000	0.5849
T5	9	Feedline Ladder (Af)	224.00 - 228.00	0.6000	0.5849
T5	10	Feedline Ladder (Af)	224.00 - 228.00	0.6000	0.5849
T5	12	LDF12-50A(2-1/4")	224.00 - 228.00	0.6000	0.5849
T5	13	WR-VG86ST-BRD(3/4)	224.00 - 228.00	0.6000	0.5849
T5	14	860 10014(3/8)	224.00 - 228.00	0.6000	0.5849
T5	15	FB-L98B-034-XXXXXX(	224.00 -	0.6000	0.5849

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		3/8")	228.00		
T5	17	FXL-1873(1 5/8)	224.00 - 228.00	0.6000	0.5849
T5	19	FSJ4-50B(1/2")	224.00 - 228.00	0.6000	0.5849
T6	2	Safety Line 3/8	220.00 - 224.00	0.6000	0.5853
T6	3	FSJ2-50(3/8")	220.00 - 224.00	0.6000	0.5853
T6	6	Step Pegs (5/8" SR) 7-in. w/30" step	220.00 - 224.00	0.6000	0.5853
T6	9	Feedline Ladder (Af)	220.00 - 224.00	0.6000	0.5853
T6	10	Feedline Ladder (Af)	220.00 - 224.00	0.6000	0.5853
T6	12	LDF12-50A(2-1/4")	220.00 - 224.00	0.6000	0.5853
T6	13	WR-VG86ST-BRD(3/4)	220.00 - 224.00	0.6000	0.5853
T6	14	860 10014(3/8)	220.00 - 224.00	0.6000	0.5853
T6	15	FB-L98B-034-XXXXXX(3/8")	220.00 - 224.00	0.6000	0.5853
T6	17	FXL-1873(1 5/8)	220.00 - 224.00	0.6000	0.5853
T6	19	FSJ4-50B(1/2")	220.00 - 224.00	0.6000	0.5853
T7	2	Safety Line 3/8	200.00 - 220.00	0.6000	0.6000
T7	3	FSJ2-50(3/8")	200.00 - 220.00	0.6000	0.6000
T7	6	Step Pegs (5/8" SR) 7-in. w/30" step	200.00 - 220.00	0.6000	0.6000
T7	9	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T7	10	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T7	12	LDF12-50A(2-1/4")	200.00 - 220.00	0.6000	0.6000
T7	13	WR-VG86ST-BRD(3/4)	200.00 - 220.00	0.6000	0.6000
T7	14	860 10014(3/8)	200.00 - 220.00	0.6000	0.6000
T7	15	FB-L98B-034-XXXXXX(3/8")	200.00 - 220.00	0.6000	0.6000
T7	17	FXL-1873(1 5/8)	200.00 - 220.00	0.6000	0.6000
T7	19	FSJ4-50B(1/2")	200.00 - 220.00	0.6000	0.6000
T8	2	Safety Line 3/8	180.00 - 200.00	0.6000	0.6000
T8	3	FSJ2-50(3/8")	180.00 - 200.00	0.6000	0.6000
T8	6	Step Pegs (5/8" SR) 7-in. w/30" step	180.00 - 200.00	0.6000	0.6000
T8	9	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T8	10	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T8	12	LDF12-50A(2-1/4")	180.00 - 200.00	0.6000	0.6000
T8	13	WR-VG86ST-BRD(3/4)	180.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	14	860 10014(3/8)	180.00 - 200.00	0.6000	0.6000
T8	15	FB-L98B-034-XXXXXX(3/8")	180.00 - 200.00	0.6000	0.6000
T8	17	FXL-1873(1 5/8)	180.00 - 200.00	0.6000	0.6000
T8	19	FSJ4-50B(1/2")	180.00 - 200.00	0.6000	0.6000
T9	2	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T9	3	FSJ2-50(3/8")	160.00 - 180.00	0.6000	0.6000
T9	6	Step Pegs (5/8" SR) 7-in. w/30" step	160.00 - 180.00	0.6000	0.6000
T9	9	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T9	10	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T9	12	LDF12-50A(2-1/4")	160.00 - 180.00	0.6000	0.6000
T9	13	WR-VG86ST-BRD(3/4)	160.00 - 180.00	0.6000	0.6000
T9	14	860 10014(3/8)	160.00 - 180.00	0.6000	0.6000
T9	15	FB-L98B-034-XXXXXX(3/8")	160.00 - 180.00	0.6000	0.6000
T9	17	FXL-1873(1 5/8)	160.00 - 180.00	0.6000	0.6000
T9	19	FSJ4-50B(1/2")	160.00 - 180.00	0.6000	0.6000
T10	2	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T10	3	FSJ2-50(3/8")	140.00 - 160.00	0.6000	0.6000
T10	6	Step Pegs (5/8" SR) 7-in. w/30" step	140.00 - 160.00	0.6000	0.6000
T10	9	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T10	10	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T10	12	LDF12-50A(2-1/4")	140.00 - 160.00	0.6000	0.6000
T10	13	WR-VG86ST-BRD(3/4)	140.00 - 160.00	0.6000	0.6000
T10	14	860 10014(3/8)	140.00 - 160.00	0.6000	0.6000
T10	15	FB-L98B-034-XXXXXX(3/8")	140.00 - 160.00	0.6000	0.6000
T10	17	FXL-1873(1 5/8)	140.00 - 160.00	0.6000	0.6000
T10	19	FSJ4-50B(1/2")	140.00 - 160.00	0.6000	0.6000
T11	2	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T11	3	FSJ2-50(3/8")	120.00 - 140.00	0.6000	0.6000
T11	6	Step Pegs (5/8" SR) 7-in. w/30" step	120.00 - 140.00	0.6000	0.6000
T11	9	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T11	10	Feedline Ladder (Af)	120.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	12	LDF12-50A(2-1/4")	120.00 - 140.00	0.6000	0.6000
T11	13	WR-VG86ST-BRD(3/4)	120.00 - 140.00	0.6000	0.6000
T11	14	860 10014(3/8)	120.00 - 140.00	0.6000	0.6000
T11	15	FB-L98B-034-XXXXXX(3/8")	120.00 - 140.00	0.6000	0.6000
T11	17	FXL-1873(1 5/8)	120.00 - 140.00	0.6000	0.6000
T11	19	FSJ4-50B(1/2")	120.00 - 140.00	0.6000	0.6000
T12	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T12	3	FSJ2-50(3/8")	100.00 - 120.00	0.6000	0.6000
T12	5	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T12	6	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T12	7	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T12	9	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T12	10	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T12	12	LDF12-50A(2-1/4")	100.00 - 120.00	0.6000	0.6000
T12	13	WR-VG86ST-BRD(3/4)	100.00 - 120.00	0.6000	0.6000
T12	14	860 10014(3/8)	100.00 - 120.00	0.6000	0.6000
T12	15	FB-L98B-034-XXXXXX(3/8")	100.00 - 120.00	0.6000	0.6000
T12	17	FXL-1873(1 5/8)	100.00 - 120.00	0.6000	0.6000
T12	19	FSJ4-50B(1/2")	100.00 - 120.00	0.6000	0.6000
T13	2	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T13	3	FSJ2-50(3/8")	80.00 - 100.00	0.6000	0.6000
T13	5	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T13	6	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T13	7	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T13	9	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T13	10	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T13	12	LDF12-50A(2-1/4")	80.00 - 100.00	0.6000	0.6000
T13	13	WR-VG86ST-BRD(3/4)	80.00 - 100.00	0.6000	0.6000
T13	14	860 10014(3/8)	80.00 - 100.00	0.6000	0.6000
T13	15	FB-L98B-034-XXXXXX(3/8")	80.00 - 100.00	0.6000	0.6000
T13	17	FXL-1873(1 5/8)	80.00 - 100.00	0.6000	0.6000
T13	19	FSJ4-50B(1/2")	80.00 - 100.00	0.6000	0.6000
T14	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T14	3	FSJ2-50(3/8")	60.00 - 80.00	0.6000	0.6000
T14	5	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000
T14	6	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	7	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000
T14	9	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T14	10	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T14	12	LDF12-50A(2-1/4")	60.00 - 80.00	0.6000	0.6000
T14	13	WR-VG86ST-BRD(3/4)	60.00 - 80.00	0.6000	0.6000
T14	14	860 10014(3/8)	60.00 - 80.00	0.6000	0.6000
T14	15	FB-L98B-034-XXXXXX(3/8")	60.00 - 80.00	0.6000	0.6000
T14	17	FXL-1873(1 5/8)	60.00 - 80.00	0.6000	0.6000
T14	19	FSJ4-50B(1/2")	60.00 - 80.00	0.6000	0.6000
T15	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T15	3	FSJ2-50(3/8")	40.00 - 60.00	0.6000	0.6000
T15	5	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T15	6	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T15	7	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T15	9	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T15	10	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T15	12	LDF12-50A(2-1/4")	40.00 - 60.00	0.6000	0.6000
T15	13	WR-VG86ST-BRD(3/4)	40.00 - 60.00	0.6000	0.6000
T15	14	860 10014(3/8)	40.00 - 60.00	0.6000	0.6000
T15	15	FB-L98B-034-XXXXXX(3/8")	40.00 - 60.00	0.6000	0.6000
T15	17	FXL-1873(1 5/8)	40.00 - 60.00	0.6000	0.6000
T15	19	FSJ4-50B(1/2")	40.00 - 60.00	0.6000	0.6000
T16	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T16	3	FSJ2-50(3/8")	20.00 - 40.00	0.6000	0.6000
T16	5	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T16	6	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T16	7	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T16	9	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T16	10	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T16	12	LDF12-50A(2-1/4")	20.00 - 40.00	0.6000	0.6000
T16	13	WR-VG86ST-BRD(3/4)	20.00 - 40.00	0.6000	0.6000
T16	14	860 10014(3/8)	20.00 - 40.00	0.6000	0.6000
T16	15	FB-L98B-034-XXXXXX(3/8")	20.00 - 40.00	0.6000	0.6000
T16	17	FXL-1873(1 5/8)	20.00 - 40.00	0.6000	0.6000
T16	19	FSJ4-50B(1/2")	20.00 - 40.00	0.6000	0.6000
T17	2	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T17	3	FSJ2-50(3/8")	0.00 - 20.00	0.6000	0.6000
T17	5	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 20.00	0.6000	0.6000
T17	6	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 20.00	0.6000	0.6000
T17	7	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 20.00	0.6000	0.6000
T17	9	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T17	10	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T17	12	LDF12-50A(2-1/4")	0.00 - 20.00	0.6000	0.6000
T17	13	WR-VG86ST-BRD(3/4)	0.00 - 20.00	0.6000	0.6000
T17	14	860 10014(3/8)	0.00 - 20.00	0.6000	0.6000
T17	15	FB-L98B-034-XXXXXX(3/8")	0.00 - 20.00	0.6000	0.6000
T17	17	FXL-1873(1 5/8)	0.00 - 20.00	0.6000	0.6000
T17	19	FSJ4-50B(1/2")	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
** Lightning Rod **									
5/8"x8-ft LRod	C	None		0.0000	250.00	No Ice	0.50	0.50	0.01
						1/2" Ice	1.31	1.31	0.01
						1" Ice	2.14	2.14	0.02
						2" Ice	3.61	3.61	0.06
12" Dia. x 30" Beacon	C	None		0.0000	250.00	No Ice	1.25	1.25	0.03
						1/2" Ice	1.96	1.96	0.05
						1" Ice	2.18	2.18	0.08
						2" Ice	2.64	2.64	0.14
3" x 6" SideLight	A	From Leg	0.50 0.00 0.00	0.0000	125.00	No Ice	0.09	0.09	0.00
						1/2" Ice	0.14	0.14	0.00
						1" Ice	0.19	0.19	0.00
						2" Ice	0.34	0.34	0.01
3" x 6" SideLight	B	From Leg	0.50 0.00 0.00	0.0000	125.00	No Ice	0.09	0.09	0.00
						1/2" Ice	0.14	0.14	0.00
						1" Ice	0.19	0.19	0.00
						2" Ice	0.34	0.34	0.01
3" x 6" SideLight	C	From Leg	0.50 0.00 0.00	0.0000	125.00	No Ice	0.09	0.09	0.00
						1/2" Ice	0.14	0.14	0.00
						1" Ice	0.19	0.19	0.00
						2" Ice	0.34	0.34	0.01
** 246 **									
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 -6.00 2.00	30.0000	246.00	No Ice	3.76	3.15	0.19
						1/2" Ice	4.12	3.49	0.25
						1" Ice	4.48	3.84	0.32
						2" Ice	5.24	4.58	0.48
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 -6.00 2.00	30.0000	246.00	No Ice	3.76	3.15	0.19
						1/2" Ice	4.12	3.49	0.25
						1" Ice	4.48	3.84	0.32
						2" Ice	5.24	4.58	0.48
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 -6.00 2.00	30.0000	246.00	No Ice	3.76	3.15	0.19
						1/2" Ice	4.12	3.49	0.25
						1" Ice	4.48	3.84	0.32
						2" Ice	5.24	4.58	0.48
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 6.00 2.00	30.0000	246.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 6.00 2.00	30.0000	246.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 6.00 2.00	30.0000	246.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
APXVAALL24_43-U-NA20	A	From Leg	4.00	30.0000	246.00	No Ice	14.69	6.87	0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
_TMO w/ Mount Pipe			-2.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20	B	From Leg	4.00	30.0000	246.00	No Ice	14.69	6.87	0.18
_TMO w/ Mount Pipe			-2.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20	C	From Leg	4.00	30.0000	246.00	No Ice	14.69	6.87	0.18
_TMO w/ Mount Pipe			-2.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
RADIO 4449 B71	A	From Leg	4.00	30.0000	246.00	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			-6.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71	B	From Leg	4.00	30.0000	246.00	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			-6.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71	C	From Leg	4.00	30.0000	246.00	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			-6.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
RADIO 4415 B25_TMO	A	From Leg	4.00	30.0000	246.00	No Ice	1.86	0.87	0.05
			6.00			1/2" Ice	2.03	1.00	0.06
			2.00			1" Ice	2.20	1.13	0.08
						2" Ice	2.58	1.43	0.12
RADIO 4415 B25_TMO	B	From Leg	4.00	30.0000	246.00	No Ice	1.86	0.87	0.05
			6.00			1/2" Ice	2.03	1.00	0.06
			2.00			1" Ice	2.20	1.13	0.08
						2" Ice	2.58	1.43	0.12
RADIO 4415 B25_TMO	C	From Leg	4.00	30.0000	246.00	No Ice	1.86	0.87	0.05
			6.00			1/2" Ice	2.03	1.00	0.06
			2.00			1" Ice	2.20	1.13	0.08
						2" Ice	2.58	1.43	0.12
8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	246.00	No Ice	1.90	1.90	0.03
			2.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	246.00	No Ice	1.90	1.90	0.03
			2.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	246.00	No Ice	1.90	1.90	0.03
			2.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
Sector Mount [SM 1303-3]	C	None		0.0000	246.00	No Ice	38.78	38.78	1.10
						1/2" Ice	46.78	46.78	1.76
						1" Ice	54.73	54.73	2.57
						2" Ice	70.62	70.62	4.60
** 245 **									
** 237 **									
(2) SBNHH-1D65C w/	A	From Leg	4.00	-20.0000	237.00	No Ice	5.56	4.47	0.08
Mount Pipe			0.00			1/2" Ice	6.07	4.97	0.16
			1.00			1" Ice	6.59	5.48	0.26
						2" Ice	7.66	6.52	0.49

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) SBNHH-1D65C w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.56 6.07 6.59 7.66	4.47 4.97 5.48 6.52	0.08 0.16 0.26 0.49
(2) SBNHH-1D65C w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.56 6.07 6.59 7.66	4.47 4.97 5.48 6.52	0.08 0.16 0.26 0.49
TPA65R-BU8D w/ Mount Pipe	A	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.94 16.87 17.82 19.76	7.91 8.76 9.63 11.40	0.12 0.24 0.36 0.67
TPA65R-BU8D w/ Mount Pipe	B	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.94 16.87 17.82 19.76	7.91 8.76 9.63 11.40	0.12 0.24 0.36 0.67
TPA65R-BU8D w/ Mount Pipe	C	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.94 16.87 17.82 19.76	7.91 8.76 9.63 11.40	0.12 0.24 0.36 0.67
RRUS-11	A	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.09 0.15
RRUS-11	B	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.09 0.15
RRUS-11	C	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.09 0.15
RRUS 4478 B14	A	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.00 -6.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RADIO 8843 B2/B66A	A	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.38 1.53 1.69 2.02	0.08 0.09 0.11 0.16
RADIO 8843 B2/B66A	B	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.38 1.53 1.69 2.02	0.08 0.09 0.11 0.16
RADIO 8843 B2/B66A	C	From Leg	4.00 -2.00 1.00	-20.0000	237.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.38 1.53 1.69 2.02	0.08 0.09 0.11 0.16
(2) ATM192012-0	A	From Leg	4.00	-20.0000	237.00	No Ice	0.96	0.50	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1/2" Ice	1.08	0.59	0.02
			1.00			1" Ice	1.21	0.69	0.03
						2" Ice	1.50	0.91	0.06
(2) ATM192012-0	B	From Leg	4.00	-20.0000	237.00	No Ice	0.96	0.50	0.01
			-2.00			1/2" Ice	1.08	0.59	0.02
			1.00			1" Ice	1.21	0.69	0.03
						2" Ice	1.50	0.91	0.06
(2) ATM192012-0	C	From Leg	4.00	-20.0000	237.00	No Ice	0.96	0.50	0.01
			-2.00			1/2" Ice	1.08	0.59	0.02
			1.00			1" Ice	1.21	0.69	0.03
						2" Ice	1.50	0.91	0.06
DC6-48-60-18-8F	A	From Leg	4.00	-20.0000	237.00	No Ice	1.21	1.21	0.03
			-6.00			1/2" Ice	1.89	1.89	0.05
			1.00			1" Ice	2.11	2.11	0.08
						2" Ice	2.57	2.57	0.14
DC6-48-60-18-8F	B	From Leg	4.00	-20.0000	237.00	No Ice	1.21	1.21	0.03
			-6.00			1/2" Ice	1.89	1.89	0.05
			1.00			1" Ice	2.11	2.11	0.08
						2" Ice	2.57	2.57	0.14
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	237.00	No Ice	1.43	1.43	0.02
			2.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	237.00	No Ice	1.43	1.43	0.02
			2.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	237.00	No Ice	1.43	1.43	0.02
			2.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
Sector Mount [SM 1303-3]	C	None		0.0000	237.00	No Ice	38.78	38.78	1.10
						1/2" Ice	46.78	46.78	1.76
						1" Ice	54.73	54.73	2.57
						2" Ice	70.62	70.62	4.60
*****									

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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	10.800	39	0.5154	0.1388
T2	240 - 236	9.715	39	0.5123	0.1385
T3	236 - 232	9.286	39	0.5069	0.1379
T4	232 - 228	8.855	39	0.4973	0.1364
T5	228 - 224	8.438	39	0.4825	0.1340
T6	224 - 220	8.031	39	0.4623	0.1307
T7	220 - 200	7.648	39	0.4366	0.1267
T8	200 - 180	5.963	39	0.3541	0.1034
T9	180 - 160	4.597	39	0.2852	0.0835
T10	160 - 140	3.501	39	0.2283	0.0698
T11	140 - 120	2.603	39	0.1885	0.0561
T12	120 - 100	1.870	39	0.1489	0.0453
T13	100 - 80	1.283	39	0.1204	0.0372

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T14	80 - 60	0.815	39	0.0917	0.0302
T15	60 - 40	0.458	39	0.0672	0.0232
T16	40 - 20	0.199	39	0.0427	0.0169
T17	20 - 0	0.046	43	0.0181	0.0106

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	5/8"x8-ft LRod	39	10.800	0.5154	0.1388	62521
246.00	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	39	10.364	0.5152	0.1387	62521
237.00	(2) SBNHH-1D65C w/ Mount Pipe	39	9.394	0.5086	0.1381	92244
125.00	3" x 6" SideLight	39	2.039	0.1581	0.0477	31126

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	39.401	2	1.8869	0.5189
T2	240 - 236	35.429	2	1.8755	0.5174
T3	236 - 232	33.859	2	1.8557	0.5154
T4	232 - 228	32.279	2	1.8205	0.5100
T5	228 - 224	30.754	2	1.7660	0.5011
T6	224 - 220	29.264	2	1.6917	0.4886
T7	220 - 200	27.862	2	1.5973	0.4737
T8	200 - 180	21.699	2	1.2938	0.3867
T9	180 - 160	16.708	2	1.0404	0.3122
T10	160 - 140	12.711	2	0.8312	0.2611
T11	140 - 120	9.440	2	0.6852	0.2099
T12	120 - 100	6.773	2	0.5405	0.1695
T13	100 - 80	4.644	2	0.4362	0.1391
T14	80 - 60	2.949	2	0.3320	0.1130
T15	60 - 40	1.654	2	0.2428	0.0866
T16	40 - 20	0.719	2	0.1541	0.0632
T17	20 - 0	0.160	11	0.0654	0.0397

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	5/8"x8-ft LRod	2	39.401	1.8869	0.5189	16400
246.00	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	2	37.804	1.8862	0.5185	16400
237.00	(2) SBNHH-1D65C w/ Mount Pipe	2	34.253	1.8619	0.5162	24057

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	3" x 6" SideLight	2	7.386	0.5740	0.1784	8497

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	250	Leg	A325N	0.6250	4	1.01	20.34	0.050	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	2.39	5.22	0.458	1.05	Member Block Shear
		Top Girt	A325X	0.5000	1	0.41	4.69	0.088	1.05	Member Block Shear
T2	240	Diagonal	A325X	0.5000	1	2.73	5.22	0.524	1.05	Member Block Shear
T3	236	Diagonal	A325X	0.5000	2	2.34	4.75	0.493	1.05	Member Block Shear
T4	232	Diagonal	A325X	0.5000	2	2.44	4.75	0.514	1.05	Member Block Shear
T5	228	Diagonal	A325X	0.5000	2	2.63	4.75	0.554	1.05	Member Block Shear
T6	224	Leg	A325N	0.7500	4	12.63	30.10	0.419	1.05	Bolt Tension
		Diagonal	A325X	0.5000	2	2.78	4.75	0.585	1.05	Member Block Shear
T7	220	Leg	A325N	0.8750	4	21.06	41.56	0.507	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	3.59	5.22	0.687	1.05	Member Block Shear
T8	200	Leg	A325N	0.8750	4	27.42	41.56	0.660	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	4.35	6.20	0.702	1.05	Member Bearing
T9	180	Leg	A325N	1.0000	4	33.01	54.52	0.606	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	5.19	6.20	0.837	1.05	Member Bearing
T10	160	Leg	A325N	1.0000	4	38.61	54.52	0.708	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	5.86	6.20	0.946	1.05	Member Bearing
T11	140	Leg	A325N	1.0000	6	29.60	54.52	0.543	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	6.92	7.33	0.945	1.05	Gusset Bearing
T12	120	Leg	A325N	1.0000	6	33.04	54.52	0.606	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	8.14	11.70	0.696	1.05	Member Bearing
T13	100	Leg	A325N	1.0000	6	36.89	54.52	0.677	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	9.16	11.70	0.783	1.05	Member Bearing
T14	80	Leg	A325N	1.0000	8	30.37	54.52	0.557	1.05	Bolt Tension
		Diagonal	A325X	0.7500	1	9.29	14.14	0.657	1.05	Member Bearing
T15	60	Leg	A325N	1.0000	8	33.23	54.52	0.610	1.05	Bolt Tension
		Diagonal	A325X	0.7500	1	11.10	14.14	0.785	1.05	Member Bearing
T16	40	Leg	A325N	1.0000	8	36.00	54.52	0.660	1.05	Bolt Tension
		Diagonal	A325X	0.7500	1	10.78	14.14	0.763	1.05	Member Bearing
T17	20	Diagonal	A325X	0.7500	3	5.63	24.85	0.227	1.05	Bolt Shear
		Horizontal	A325X	0.7500	2	4.80	24.85	0.193	1.05	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	250 - 240	ROHN 2.5 STD	10.00	5.00	63.3 K=1.00	1.7040	-6.44	57.19	0.113 [1]
T2	240 - 236	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-14.31	63.56	0.225 [1]
T3	236 - 232	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-22.69	63.56	0.357 [1]
T4	232 - 228	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-33.77	63.56	0.531 [1]
T5	228 - 224	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-45.19	63.56	0.711 [1]
T6	224 - 220	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-56.69	63.56	0.892 [1]
T7	220 - 200	ROHN 3 EH	20.03	4.01	42.3 K=1.00	3.0159	-92.91	119.06	0.780 [1]
T8	200 - 180	ROHN 3.5 EH	20.03	5.01	46.0 K=1.00	3.6784	-120.83	141.81	0.852 [1]
T9	180 - 160	ROHN 4 EH	20.04	6.68	54.3 K=1.00	4.4074	-145.87	159.91	0.912 [1]
T10	160 - 140	ROHN 5 EH	20.04	6.68	43.6 K=1.00	6.1120	-171.67	239.37	0.717 [1]
T11	140 - 120	ROHN 5 EH	20.03	6.68	43.6 K=1.00	6.1120	-198.64	239.39	0.830 [1]
T12	120 - 100	ROHN 6 EH	20.04	10.02	54.8 K=1.00	8.4049	-223.13	303.73	0.735 [1]
T13	100 - 80	ROHN 6 EH	20.03	10.02	54.8 K=1.00	8.4049	-250.86	303.76	0.826 [1]
T14	80 - 60	ROHN 8 EHS	20.04	10.02	41.2 K=1.00	9.7193	-277.49	386.36	0.718 [1]
T15	60 - 40	ROHN 8 EHS	20.03	10.02	41.2 K=1.00	9.7193	-305.68	386.41	0.791 [1]
T16	40 - 20	ROHN 8 EHS	20.04	10.02	41.2 K=1.00	9.7193	-333.60	386.37	0.863 [1]
T17	20 - 0	ROHN 8 EH	20.06	10.03	41.8 K=1.00	12.7627	-341.73	505.41	0.676 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	250 - 240	L1 1/2x1 1/2x3/16	6.78	3.11	127.2 K=1.00	0.5273	-2.42	9.33	0.259 [1]
T2	240 - 236	L1 1/2x1 1/2x3/16	6.08	2.78	115.2 K=1.01	0.5273	-2.71	11.06	0.245 [1]
T3	236 - 232	L1 1/2x1 1/2x3/16	6.08	2.71	113.3 K=1.02	0.5273	-4.68	11.32	0.414 [1]
T4	232 - 228	L1 1/2x1 1/2x3/16	6.08	2.71	113.3 K=1.02	0.5273	-4.95	11.32	0.437 [1]
T5	228 - 224	L1 1/2x1 1/2x3/16	6.08	2.71	113.3 K=1.02	0.5273	-5.25	11.32	0.464 [1]
T6	224 - 220	L1 1/2x1 1/2x3/16	6.08	2.71	113.3	0.5273	-5.80	11.32	0.512 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	220 - 200	L1 1/2x1 1/2x3/16	7.57	3.63	148.5 K=1.02	0.5273	-3.67	6.85	0.537 [1]
T8	200 - 180	L1 3/4x1 3/4x3/16	9.76	4.73	165.2 K=1.00	0.6211	-4.43	6.52	0.680 [1]
T9	180 - 160	L2 1/2x2 1/2x3/16	12.32	6.04	146.4 K=1.00	0.9023	-5.61	12.05	0.465 [1]
T10	160 - 140	L2 1/2x2 1/2x3/16	14.14	6.90	167.4 K=1.00	0.9023	-6.05	9.22	0.656 [1]
T11	140 - 120	L2 1/2x2 1/2x1/4	15.96	7.80	190.7 K=1.00	1.1900	-7.05	9.37	0.753 [1]
T12	120 - 100	L3x3x1/4	19.21	9.47	194.2 K=1.00	1.4400	-8.34	10.93	0.763 [1]
T13	100 - 80	L3 1/2x3 1/2x1/4	20.93	10.31	178.3 K=1.00	1.6900	-9.81	15.21	0.645 [1]
T14	80 - 60	L3 1/2x3 1/2x1/4	22.86	11.20	193.7 K=1.00	1.6900	-9.47	12.89	0.735 [1]
T15	60 - 40	L4x4x1/4	24.68	12.07	182.2 K=1.00	1.9400	-12.14	16.72	0.726 [1]
T16	40 - 20	L4x4x1/4	26.63	13.08	197.5 K=1.00	1.9400	-11.87	14.24	0.834 [1]
T17	20 - 0	ROHN 2.5 STD	24.37	12.18	154.3 K=1.00	1.7040	-16.89	16.17	1.045 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	ROHN 2.5 STD	25.22	12.25	155.2 K=1.00	1.7040	-9.59	15.99	0.600 [1]

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	250 - 240	L1 1/2x1 1/2x3/16	4.58	4.13	169.0 K=1.00	0.5273	-0.41	5.28	0.078 [1]

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 1.5 STD	6.31	5.95	114.6 K=1.00	0.7995	-1.50	13.75	0.109 [1]

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 1.5 STD	11.50	10.77	207.6 K=1.00	0.7995	-0.76	4.19	0.182 [1]

[1] $P_u / \phi P_n$ controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 1.5 STD	6.31	6.31	121.5 K=1.00	0.7995	-0.05	12.23	0.004 [1]

[1] $P_u / \phi P_n$ controls

Redundant Hip Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 2.5 STD	15.10	15.10	191.2 K=1.00	1.7040	-0.07	10.53	0.007 [1]

[1] $P_u / \phi P_n$ controls

Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 3 STD	12.61	12.61	130.0	2.2285	-0.02	29.77	0.001 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
					K=1.00				

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	250 - 240	ROHN 2.5 STD	10.00	5.00	63.3	1.7040	4.03	76.68	0.053 [1]
T2	240 - 236	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	9.79	76.68	0.128 [1]
T3	236 - 232	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	17.72	76.68	0.231 [1]
T4	232 - 228	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	28.44	76.68	0.371 [1]
T5	228 - 224	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	39.26	76.68	0.512 [1]
T6	224 - 220	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	50.50	76.68	0.659 [1]
T7	220 - 200	ROHN 3 EH	20.03	4.01	42.3	3.0159	84.22	135.72	0.621 [1]
T8	200 - 180	ROHN 3.5 EH	20.03	5.01	46.0	3.6784	109.69	165.53	0.663 [1]
T9	180 - 160	ROHN 4 EH	20.04	6.68	54.3	4.4074	132.06	198.34	0.666 [1]
T10	160 - 140	ROHN 5 EH	20.04	6.68	43.6	6.1120	154.46	275.04	0.562 [1]
T11	140 - 120	ROHN 5 EH	20.03	6.68	43.6	6.1120	177.62	275.04	0.646 [1]
T12	120 - 100	ROHN 6 EH	20.04	10.02	54.8	8.4049	198.22	378.22	0.524 [1]
T13	100 - 80	ROHN 6 EH	20.03	10.02	54.8	8.4049	221.37	378.22	0.585 [1]
T14	80 - 60	ROHN 8 EHS	20.04	10.02	41.2	9.7193	242.94	437.37	0.555 [1]
T15	60 - 40	ROHN 8 EHS	20.03	10.02	41.2	9.7193	265.85	437.37	0.608 [1]
T16	40 - 20	ROHN 8 EHS	20.04	10.02	41.2	9.7193	288.03	437.37	0.659 [1]
T17	20 - 0	ROHN 8 EH	20.06	10.03	41.8	12.7627	291.46	574.32	0.507 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	250 - 240	L1 1/2x1 1/2x3/16	6.78	3.11	84.4	0.3076	2.39	13.38	0.179 [1]
T2	240 - 236	L1 1/2x1 1/2x3/16	6.08	2.78	75.7	0.3076	2.73	13.38	0.204 [1]
T3	236 - 232	L1 1/2x1 1/2x3/16	6.08	2.71	75.7	0.3076	4.69	13.38	0.350 [1]
T4	232 - 228	L1 1/2x1 1/2x3/16	6.08	2.71	75.7	0.3076	4.88	13.38	0.365 [1]
T5	228 - 224	L1 1/2x1 1/2x3/16	6.08	2.71	75.7	0.3076	5.27	13.38	0.394 [1]
T6	224 - 220	L1 1/2x1 1/2x3/16	6.08	2.71	75.7	0.3076	5.56	13.38	0.416 [1]
T7	220 - 200	L1 1/2x1 1/2x3/16	6.24	2.98	81.0	0.3076	3.59	13.38	0.268 [1]
T8	200 - 180	L1 3/4x1 3/4x3/16	9.76	4.73	108.0	0.3779	4.35	16.44	0.265 [1]
T9	180 - 160	L2 1/2x2 1/2x3/16	12.32	6.04	94.7	0.5889	5.19	25.62	0.202 [1]
T10	160 - 140	L2 1/2x2 1/2x3/16	14.14	6.90	108.0	0.5889	5.86	25.62	0.229 [1]
T11	140 - 120	L2 1/2x2 1/2x1/4	15.96	7.80	123.4	0.7753	6.92	33.73	0.205 [1]
T12	120 - 100	L3x3x1/4	19.21	9.47	124.2	0.9394	8.14	45.79	0.178 [1]
T13	100 - 80	L3 1/2x3 1/2x1/4	20.93	10.31	114.8	1.1269	9.16	54.94	0.167 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T14	80 - 60	L3 1/2x3 1/2x1/4	22.86	11.20	124.8	1.1034	9.29	53.79	0.173 [1]
T15	60 - 40	L4x4x1/4	24.68	12.07	117.2	1.2909	11.10	62.93	0.176 [1]
T16	40 - 20	L4x4x1/4	26.63	13.08	126.9	1.2909	10.78	62.93	0.171 [1]
T17	20 - 0	ROHN 2.5 STD	24.37	12.18	154.3	1.7040	15.71	76.68	0.205 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 2.5 STD	25.22	12.25	155.2	1.7040	8.55	76.68	0.112 [1]

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	250 - 240	L1 1/2x1 1/2x3/16	4.58	4.13	114.1	0.3076	0.41	13.38	0.031 [1]

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 1.5 STD	6.31	5.95	114.6	0.7995	0.90	35.98	0.025 [1]

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T17	20 - 0	ROHN 1.5 STD	11.50	10.77	207.6	0.7995	1.50	35.98	0.042 [1]

[1] $P_u / \phi P_n$ controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	ROHN 2.5 STD	15.10	15.10	191.2	1.7040	0.09	76.68	0.001 [1]

[1] $P_u / \phi P_n$ controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T17	20 - 0	ROHN 3 STD	12.61	12.61	130.0	2.2285	0.00	100.28	0.000 [1]

[1] $P_u / \phi P_n$ controls

Section Capacity Table

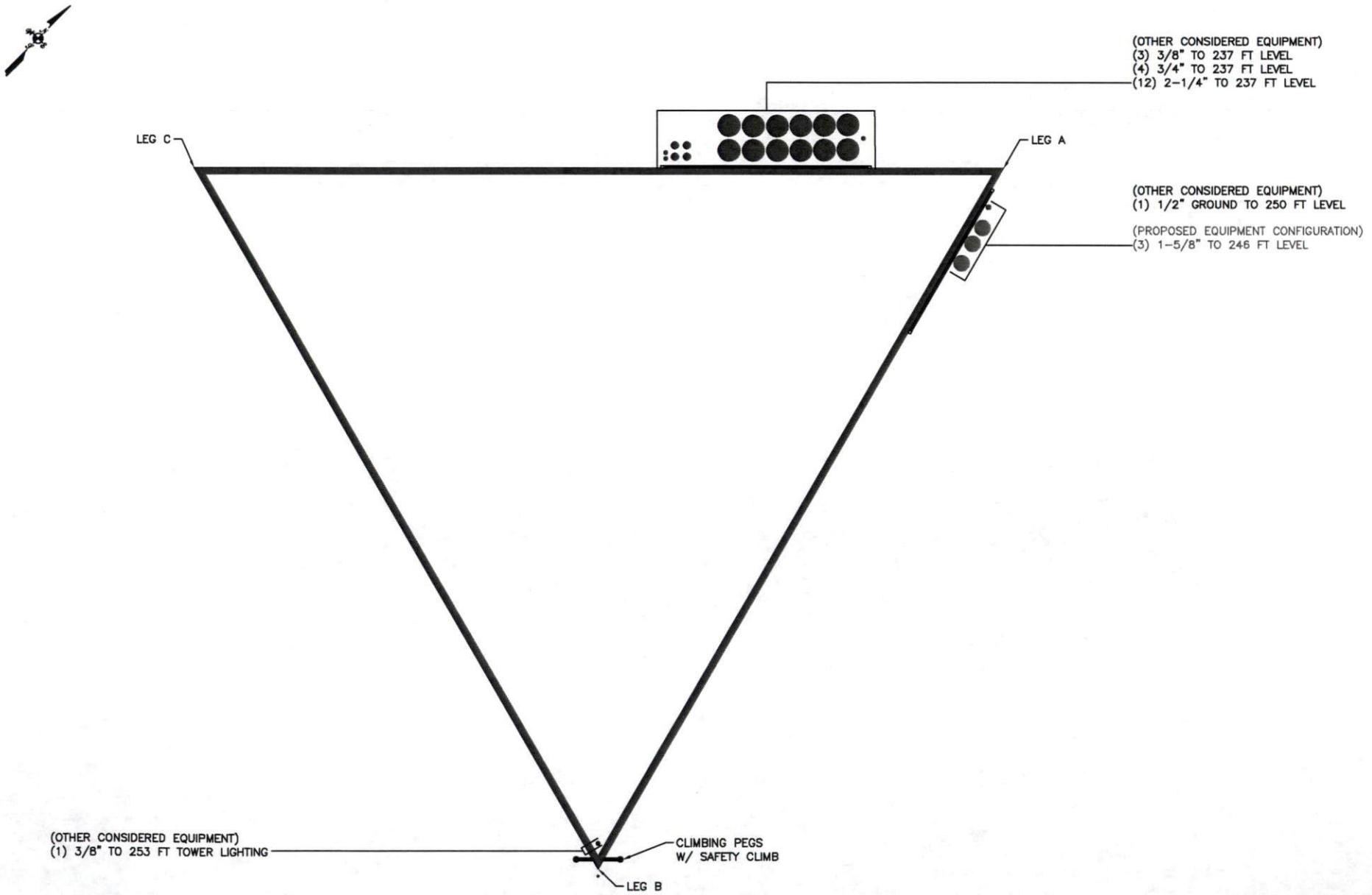
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	250 - 240	Leg	ROHN 2.5 STD	3	-6.44	60.05	10.7	Pass
T2	240 - 236	Leg	ROHN 2.5 STD	21	-14.31	66.74	21.4	Pass
T3	236 - 232	Leg	ROHN 2.5 STD	30	-22.69	66.74	34.0	Pass
T4	232 - 228	Leg	ROHN 2.5 STD	39	-33.77	66.74	50.6	Pass
T5	228 - 224	Leg	ROHN 2.5 STD	48	-45.19	66.74	67.7	Pass
T6	224 - 220	Leg	ROHN 2.5 STD	57	-56.69	66.74	84.9	Pass
T7	220 - 200	Leg	ROHN 3 EH	66	-92.91	125.02	74.3	Pass
T8	200 - 180	Leg	ROHN 3.5 EH	99	-120.83	148.90	81.1	Pass
T9	180 - 160	Leg	ROHN 4 EH	126	-145.87	167.90	86.9	Pass
T10	160 - 140	Leg	ROHN 5 EH	147	-171.67	251.34	68.3 70.8 (b)	Pass
T11	140 - 120	Leg	ROHN 5 EH	168	-198.64	251.36	79.0	Pass
T12	120 - 100	Leg	ROHN 6 EH	189	-223.13	318.91	70.0	Pass
T13	100 - 80	Leg	ROHN 6 EH	204	-250.86	318.94	78.7	Pass
T14	80 - 60	Leg	ROHN 8 EHS	219	-277.49	405.68	68.4	Pass
T15	60 - 40	Leg	ROHN 8 EHS	234	-305.68	405.73	75.3	Pass
T16	40 - 20	Leg	ROHN 8 EHS	249	-333.60	405.69	82.2	Pass
T17	20 - 0	Leg	ROHN 8 EH	264	-341.73	530.68	64.4	Pass
T1	250 - 240	Diagonal	L1 1/2x1 1/2x3/16	10	-2.42	9.80	24.7 45.8 (b)	Pass
T2	240 - 236	Diagonal	L1 1/2x1 1/2x3/16	24	-2.71	11.61	23.3 52.4 (b)	Pass
T3	236 - 232	Diagonal	L1 1/2x1 1/2x3/16	33	-4.68	11.89	39.4 65.1 (b)	Pass
T4	232 - 228	Diagonal	L1 1/2x1 1/2x3/16	43	-4.95	11.89	41.7 67.6 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	228 - 224	Diagonal	L1 1/2x1 1/2x3/16	54	-5.25	11.89	44.2 72.8 (b)	Pass
T6	224 - 220	Diagonal	L1 1/2x1 1/2x3/16	62	-5.80	11.89	48.8 77.4 (b)	Pass
T7	220 - 200	Diagonal	L1 1/2x1 1/2x3/16	72	-3.67	7.19	51.1 68.7 (b)	Pass
T8	200 - 180	Diagonal	L1 3/4x1 3/4x3/16	105	-4.43	6.84	64.8 70.2 (b)	Pass
T9	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	132	-5.61	12.66	44.3 83.7 (b)	Pass
T10	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	153	-6.05	9.68	62.5 94.6 (b)	Pass
T11	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	174	-7.05	9.83	71.7 94.5 (b)	Pass
T12	120 - 100	Diagonal	L3x3x1/4	195	-8.34	11.48	72.7	Pass
T13	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	210	-9.81	15.97	61.4 78.3 (b)	Pass
T14	80 - 60	Diagonal	L3 1/2x3 1/2x1/4	225	-9.47	13.53	70.0	Pass
T15	60 - 40	Diagonal	L4x4x1/4	240	-12.14	17.55	69.2 78.5 (b)	Pass
T16	40 - 20	Diagonal	L4x4x1/4	255	-11.87	14.95	79.4	Pass
T17	20 - 0	Diagonal	ROHN 2.5 STD	285	-16.89	16.97	99.5	Pass
T17	20 - 0	Horizontal	ROHN 2.5 STD	281	-9.59	16.79	57.1	Pass
T1	250 - 240	Top Girt	L1 1/2x1 1/2x3/16	5	-0.41	5.55	7.5 8.8 (b)	Pass
T17	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	267	-1.50	14.44	10.4	Pass
T17	20 - 0	Redund Diag 1 Bracing	ROHN 1.5 STD	284	-0.76	4.40	17.4	Pass
T17	20 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	288	-0.05	12.84	0.4	Pass
T17	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	289	-0.07	11.05	0.7	Pass
T17	20 - 0	Inner Bracing	ROHN 3 STD	294	-0.01	31.26	0.3	Pass
						Summary		
						Leg (T9)	86.9	Pass
						Diagonal (T17)	99.5	Pass
						Horizontal (T17)	57.1	Pass
						Top Girt (T1)	8.8	Pass
						Redund Horz 1 Bracing (T17)	10.4	Pass
						Redund Diag 1 Bracing (T17)	17.4	Pass
						Redund Hip 1 Bracing (T17)	0.4	Pass
						Redund Hip Diagonal 1 Bracing (T17)	0.7	Pass
						Inner Bracing (T17)	0.3	Pass
						Bolt Checks	90.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						RATING =	**99.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(3) 3/8" TO 237 FT LEVEL
(4) 3/4" TO 237 FT LEVEL
(12) 2-1/4" TO 237 FT LEVEL
LEG C
LEG A
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" GROUND TO 250 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 246 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 253 FT TOWER LIGHTING
CLIMBING PEGS
W/ SAFETY CLIMB
LEG B

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

CROWN CASTLE

Site Info	
BU #	879743
Site Name	P3) Erwin/McLamb (F1
Order #	540848 Rev. 0

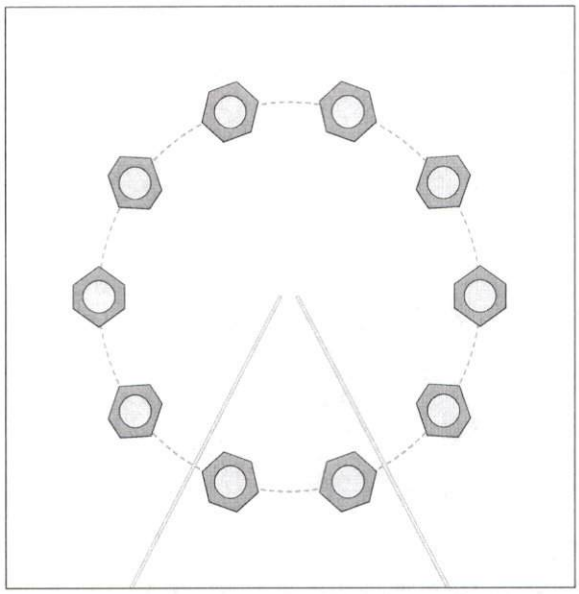
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0.5

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	0.00	308.00
Shear Force (kips)	0.00	33.00

**TIA-222-H Section 15.5 Applied*

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

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

(10) 1" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi)

l_{ar} (in): 0.5

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 30.8	ϕPn_t = 56.81	**Stress Rating**
Vu = 3.3	ϕVn = 36.82	**51.6%**
Mu = n/a	ϕMn = n/a	Pass

Drilled Pier Foundation

BU # :	879743
Site Name:	(P3) ERWIN/MCLAMB(F1)
Order Number:	540848 Rev.0
TIA-222 Revison:	H
Tower Type:	Self Support

Applied Loads	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	361	308
Shear Force (kips)	38	33

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

Pier Design Data		
Depth	31	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 29' below grade		
Pier Diameter	4	ft
Rebar Quantity	18	
Rebar Size	9	
Rebar Cage Diameter	39	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	15.70	15.70
Soil Safety Factor	26.92	31.00
Max Moment (kip-ft)	360.33	312.91
Rating*	*4.7%*	*4.1%*
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	544.94	544.94
End Bearing (kips)	565.49	-
Weight of Concrete (kips)	53.93	40.44
Total Capacity (kips)	1110.43	585.39
Axial (kips)	414.93	308.00
Rating*	*35.6%*	*50.1%*
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	15.97	14.71
Critical Moment (kip-ft)	360.20	311.46
Critical Moment Capacity	1774.43	1192.25
Rating*	*19.3%*	*24.9%*
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	23.86	23.86
Critical Shear (kip)	48.07	41.75
Critical Shear Capacity	342.93	203.70
Rating*	*13.4%*	*19.5%*

Structural Foundation Rating*	**24.9%**
Soil Interaction Rating*	**50.1%**

*Rating per TIA-222-H Section 15.5

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

Go to Soil Calculations

Soil Profile

Groundwater Depth	12.6	# of Layers	7

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	5	3	110	150	2	0	1.100	1.100	0.00	0.00			Cohesive
3	5	12.6	7.6	115	150	2.5	0	1.375	1.375	1.38	1.38			Cohesive
4	12.6	14	1.4	52.6	87.6	2.5	0	1.375	1.375	1.38	1.38			Cohesive
5	14	17	3	52.6	87.6	0	42	0.000	0.000	1.70	1.70			Cohesionless
6	17	27	10	57.6	87.6	5.5	0	2.475	2.475	3.03	3.03			Cohesive
7	27	31	4	57.6	87.6	0	45	0.00	0.00	2.50	2.50	60		Cohesionless