ROBINSON & COLE LLP

KENNETH C. BALDWIN

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Also admitted in Massachusetts

September 17, 2013

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
347 East Street, Wolcott, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 177-foot level of the existing 180-foot tower at the above-referenced address. The tower is owned by Crown Castle. The Council approved Cellco's use of this tower in 1986 (Docket No. 56). Cellco now intends to replace three (3) of its existing antennas with three (3) model BXA-70040-6CF LTE antenna at the same level on the tower. Included in Attachment 1 are specifications for the replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Thomas G. Dunn, Mayor for the Town of Wolcott. A copy of this letter is also being sent to Augostinho and Joanne Rodrigues, the owners of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 177-foot level on the 180-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed State or local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Thomas G. Dunn, Wolcott Mayor
Augostinho and Joanne Rodrigues
Sandy M. Carter

ATTACHMENT 1

BXA-70040-6CF-EDIN-X

X-Pol | FET Panel | 40° | 16.0 dBd

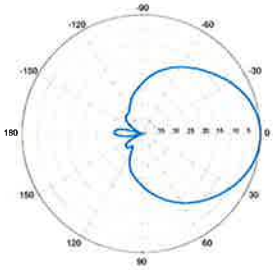
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	42°	40°
Vertical beamwidth	12°	10°
Gain	15.5 dBd (17.6 dBi)	16.0 dBd (18.1 dBi)
Electrical downtilt (X)	0, 2, 4, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-12.1 dB	-13.4 dB
Front-to-back ratio (+/-30°)	-35.8 dB	-38.0 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -27 dB	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1806 x 606 x 200 mm	71.1 x 23.9 x 7.9 in
Depth with z-brackets	240 mm	9.4 in
Weight without mounting brackets	17 kg	38 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 1.09 m² Side: 0.36 m²	Front: 11.8 ft² Side: 3.9 ft²
Wind load @ 161 km/hr (100 mph)	Front:1564 N Side: 547 N	Front: 350 lbf Side: 123 lbf

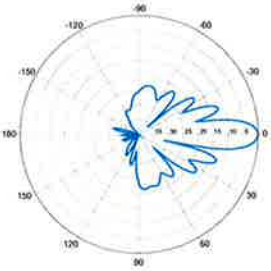
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting Bracket Kit	36210003	50-160 mm 2.0-6.3 in	6.3 kg 14 lbs
3-Point Downtilt Bracket Kit	36210004	50-160 mm 2.0-6.3 in	7.3 kg 16 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		
Concealment Configurations	This model cannot be used in a standard FP concealment configuration		

BXA-70040-6CF-EDIN-X



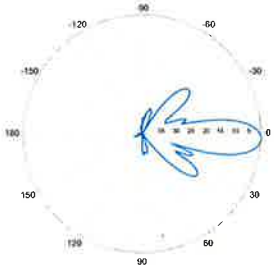
Horizontal | 750 MHz

BXA-70040-6CF-EDIN-0



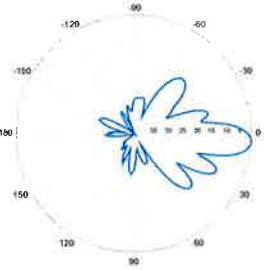
0° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-2

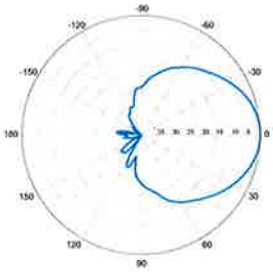


2° | Vertical | 750 MHz

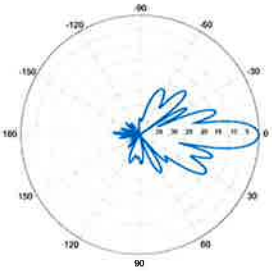
BXA-70040-6CF-EDIN-4



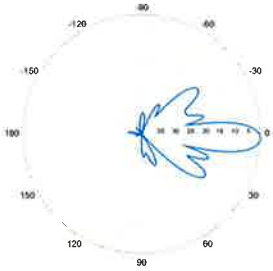
4° | Vertical | 750 MHz



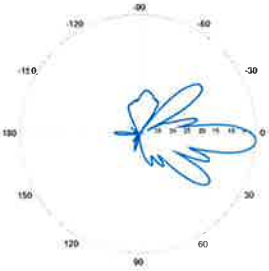
Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz



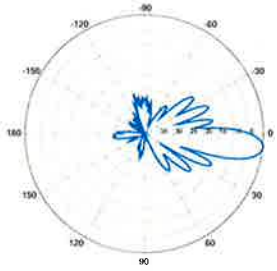
4° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-70040-6CF-EDIN-X

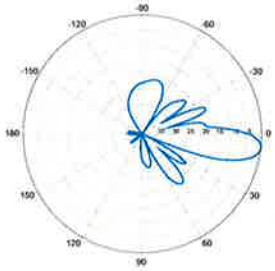
X-Pol | FET Panel | 40° | 16.0 dBd

BXA-70040-6CF-EDIN-6



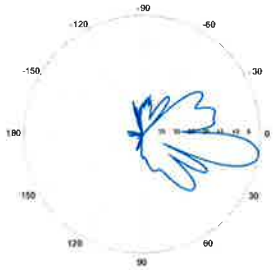
6° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-8

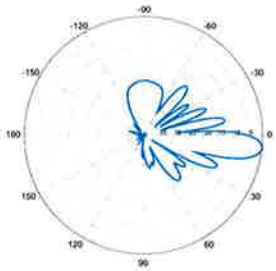


8° | Vertical | 750 MHz

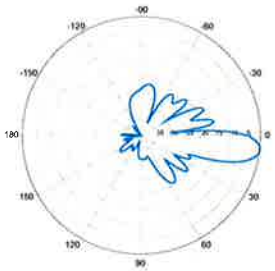
BXA-70040-6CF-EDIN-10



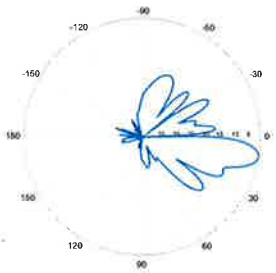
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

ATTACHMENT 2

	General	Power	Density					
Site Name: Wolcott								
Tower Height: Verizon @ 177ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	160	0.0159	880	0.5867	2.71%	
*AT&T UMTS	2	875	160	0.0246	1900	1.0000	2.46%	
*AT&T GSM	1	538	160	0.0076	880	0.5867	1.29%	
*AT&T GSM	4	934	160	0.0525	1900	1.0000	5.25%	
*AT&T LTE	1	1375	160	0.0193	734	0.4893	3.95%	
*Clearwire	2	153	168	0.0039	2496	1.0000	0.39%	
*Clearwire	1	211	168	0.0027	11 GHz	1.0000	0.27%	
*MetroPCS CDMA	3	727	148	0.0358	2135	1.0000	3.58%	
*MetroPCS LTE	1	1200	148	0.0197	2130	1.0000	1.97%	
*T-Mobile UMTS/LTE	4	12	188	0.0005	2100	1.0000	0.05%	
*T-Mobile GSM/UMTS	4	11	188	0.0004	1950	1.0000	0.04%	
Verizon PCS	**11**	**383**	**177**	**0.0484**	**1970**	**1.0000**	**4.84%**	
Verizon Cellular	**9**	**371**	**177**	**0.0383**	**869**	**0.5793**	**6.62%**	
Verizon AWS	**1**	**1750**	**177**	**0.0201**	**2145**	**1.0000**	**2.01%**	
Verizon 700	**1**	**1050**	**177**	**0.0121**	**698**	**0.4653**	**2.59%**	
								38.00%
* Source: Siting Council								

ATTACHMENT 3

Date: **September 03, 2013**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
9197551012

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate Carrier Site Name:**	Wolcott, CT
Crown Castle Designation:	**Crown Castle BU Number:**	806362
	Crown Castle Site Name:	NHV 108 943133
	Crown Castle JDE Job Number:	242132
	Crown Castle Work Order Number:	645167
	Crown Castle Application Number:	196455 Rev. 4
Engineering Firm Designation:	**FDH Engineering, Inc. Project Number:**	13SB411400

Site Data: **INTERSECTION OF RTE 322/MERIDIAN RD WOLCOTT SITE, WOLCOTT, New Haven County, CT**
Latitude *41° 33' 34.41"*, Longitude *-72° 56' 49.1"*
180 Foot - Self Support Tower

Dear Veronica Harris,

FDH Engineering, Inc. 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 573480, in accordance with application 196455, revision 4.

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.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *FDH Engineering, Inc.* 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.

Respectfully submitted by:

David Zambrano, EI
Project Engineer

Reviewed by:

Christopher M. Murphy, PE
President
CT PE License No. 25842

tnxTower Report - version 6.1.3.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by ROHN in September of 1986. The tower was originally designed for E.I.A. zone C with 1" radial ice. The tower has been modified per reinforcement drawings prepared by All-Points Technology Corp, P.C., in August of 2002. Reinforcement consists of addition of concrete cap to existing foundations.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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
177.0	177.0	3	antel	BXA-70040/6CFx4 w/ Mount Pipe	-	-	-

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
180.0	188.0	3	ericsson	AIR 21	1	1-5/8	3
	180.0	6	rfs celwave	ATMAA1412D-1A20	18	1-5/8	1
	180.0	1	crown mounts	Pipe Mount			
177.0	177.0	3	antel	BXA-70063/6CFx4 w/ Mount Pipe	-	-	2
		1	antel	BXA-185063/12CFx2 w/ Mount Pipe	12	1-5/8	1
		2	andrew	DB846F65ZAXY w/ Mount Pipe			
		2	antel	LPA-80063/6CFx5 w/ Mount Pipe			
		1	crown mounts	Sector Mount [SM 502-3]			
		2	rfs celwave	APX18-206516L-CT0 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		2	swedcom	SC-E 6014 rev2 w/ Mount Pipe			
168.0	168.0	3	argus technologies	LLPX310R w/ Mount Pipe	3 1	5/16 1/2	1
		1	crown mounts	Sector Mount [SM 411-3]			
		1	dragonwave	A-ANT-18G-2-C			
		3	samsung telecommunications	FDD_R6_RRH			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
158.0	160.0	6	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD	12 2 1	1-1/4 3/4 3/8	1
		2	andrew	SBNH-1D6565C w/ Mount Pipe			
		3	communication components inc.	DTMABP7819VG12A			
		6	ericsson	RRUS-11			
		4	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
		1	raycap	DC6-48-60-18-8F			
	158.0	1	crown mounts	Sector Mount [SM 502-3]			
148.0	148.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
112.0	113.0	1	andrew	HP8-59E	1	EW107	2
	112.0	1	crown mounts	Pipe Mount [PM 601-1]			
70.0	70.0	1	andrew	HP10-59E	1	EW107	1
		1	crown mounts	Pipe Mount [PM 602-1]			
40.0	40.0	1	crown mounts	Side Arm Mount [SO 201-1]	1	1/2	1
		1	gps	GPS_A			

Notes:
1) Existing Equipment
2) Existing Equipment to be removed, not considered in this analysis
3) Reserved Equipment

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)
180	180	4	RFS	PD10017	-	-
170	170	3	RFS	PD1132D	-	-
160	160	2	-	6' STD Dish	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2303630	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	217670	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	529684	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	All Points Technology Corp.	903539	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.3.1), 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) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Engineering, Inc. 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	180 - 160	Leg	ROHN 2.5 STD	2	-12.18	41.14	29.5	Pass
T2	160 - 140	Leg	ROHN 3 X-STR	41	-42.84	83.78	50.6	Pass
T3	140 - 120	Leg	ROHN 4 X-STR	80	-72.22	139.07	51.6	Pass
T4	120 - 100	Leg	ROHN 5 X-STR	119	-94.12	177.42	52.9	Pass
T5	100 - 80	Leg	ROHN 5 X-STR	146	-117.18	177.35	66.2	Pass
T6	80 - 60	Leg	ROHN 6 EHS	173	-138.15	212.13	65.5	Pass
T7	60 - 40	Leg	ROHN 6 X-STR	200	-160.77	264.22	61.4	Pass
T8	40 - 20	Leg	ROHN 6 X-STR	227	-182.04	264.19	69.7	Pass
T9	20 - 0	Leg	ROHN 8 EHS	254	-191.90	332.47	58.5	Pass
T1	180 - 160	Diagonal	ROHN 2 STD	9	-5.91	15.54	37.1	Pass
T2	160 - 140	Diagonal	ROHN 2 STD	48	-7.92	13.38	58.9	Pass
T3	140 - 120	Diagonal	ROHN 2 STD	87	-7.57	11.51	66.4	Pass
T4	120 - 100	Diagonal	ROHN 2.5 STD	126	-9.11	14.43	64.5	Pass
T5	100 - 80	Diagonal	ROHN 2.5 STD	153	-8.24	12.60	67.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T6	80 - 60	Diagonal	ROHN 2.5 STD	179	-9.84	11.15	91.1	Pass
T7	60 - 40	Diagonal	ROHN 2.5 X-STR	206	-9.86	12.30	83.1	Pass
T8	40 - 20	Diagonal	ROHN 3 STD	233	-9.52	16.86	58.8	Pass
T9	20 - 0	Diagonal	ROHN 3 STD	264	-14.54	28.18	53.7 58.7 (b)	Pass
T1	180 - 160	Horizontal	ROHN 1.5 STD	7	-3.17	20.29	15.3 18.0 (b)	Pass
T2	160 - 140	Horizontal	ROHN 1.5 STD	46	-4.90	17.38	28.1 28.4 (b)	Pass
T3	140 - 120	Horizontal	ROHN 2 STD	85	-5.18	24.65	21.2 30.5 (b)	Pass
T4	120 - 100	Horizontal	ROHN 2 STD	124	-5.41	20.43	27.1 32.2 (b)	Pass
T5	100 - 80	Horizontal	ROHN 2 STD	151	-5.37	14.77	37.6	Pass
T6	80 - 60	Horizontal	ROHN 2.5 STD	178	-6.90	25.42	28.0 42.0 (b)	Pass
T7	60 - 40	Horizontal	ROHN 2.5 STD	205	-7.16	19.66	37.8 43.7 (b)	Pass
T8	40 - 20	Horizontal	ROHN 2.5 STD	232	-7.17	15.57	48.0	Pass
T9	20 - 0	Horizontal	ROHN 3 STD	263	-7.93	27.51	30.0 48.1 (b)	Pass
T1	180 - 160	Top Girt	ROHN 1.5 STD	5	-1.33	20.34	6.5	Pass
T9	20 - 0	Redund Horz 1 Bracing	ROHN TS1.5x11 ga	261	-3.33	4.90	68.9	Pass
T9	20 - 0	Redund Diag 1 Bracing	ROHN 1.5 STD	262	-3.04	3.58	86.1	Pass
T9	20 - 0	Redund Hip 1 Bracing	ROHN TS1.5x11 ga	270	-0.04	4.35	1.0	Pass
T9	20 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	282	-0.07	6.98	0.7	Pass
T1	180 - 160	Inner Bracing	L2x2x1/8	16	-0.00	5.82	0.4	Pass
T2	160 - 140	Inner Bracing	L2x2x1/8	52	-0.01	4.29	0.3	Pass
T3	140 - 120	Inner Bracing	L2x2x1/8	91	-0.01	2.93	0.4	Pass
T4	120 - 100	Inner Bracing	L2x2x1/8	130	-0.01	1.66	0.4	Pass
T5	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	157	-0.01	3.47	0.4	Pass
T6	80 - 60	Inner Bracing	L3x3x3/16	185	-0.01	4.55	0.5	Pass
T7	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	212	-0.01	7.45	0.5	Pass
T8	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.01	5.93	0.5	Pass
T9	20 - 0	Inner Bracing	ROHN 3 STD	284	-0.01	19.74	0.4	Pass
							Summary	
						Leg (T8)	69.7	Pass
						Diagonal (T6)	91.1	Pass
						Horizontal (T9)	48.1	Pass
						Top Girt (T1)	6.5	Pass
						Redund Horz 1 Bracing (T9)	68.9	Pass
						Redund Diag 1 Bracing	86.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						(T9)		
						Redund Hip 1 Bracing (T9)	1.0	Pass
						Redund Hip Diagonal Bracing (T9)	0.7	Pass
						Inner Bracing (T4)	0.5	Pass
						Bolt Checks	58.7	Pass
						Rating =	91.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	0	49.0	Pass
1	Base Foundation Soil Interaction	0	26.4	Pass

Structure Rating (max from all components) =	91.1%

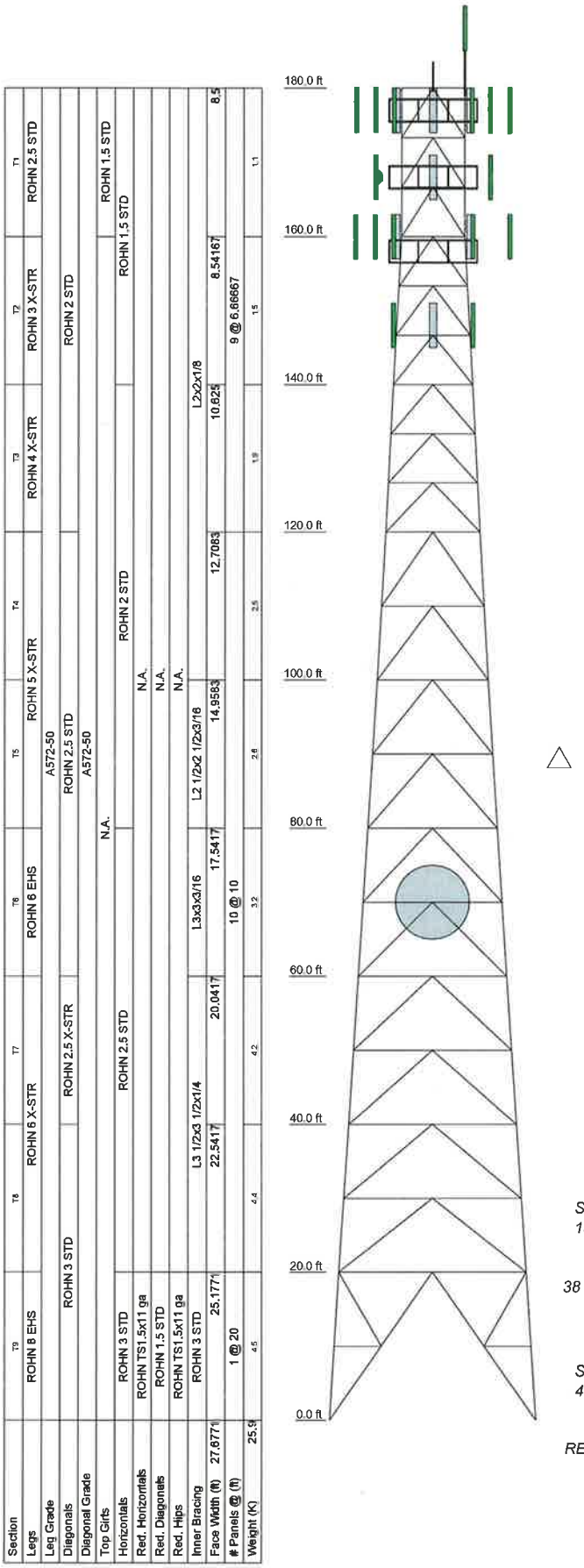
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EHS	ROHN 6 X-STR		ROHN 6 EHS	A572-50		ROHN 4 X-STR	ROHN 3 X-STR	ROHN 2.5 STD
Leg Grade									
Diagonals	ROHN 3 STD		ROHN 2.5 X-STR		ROHN 2.5 STD		ROHN 2 STD		
Diagonal Grade					A572-50				
Top Girts				N.A.					ROHN 1.5 STD
Horizontals	ROHN 3 STD		ROHN 2.5 STD			ROHN 2 STD		ROHN 1.5 STD	
Red. Horizontals	ROHN TS1.5x11 ga				N.A.				
Red. Diagonals	ROHN 1.5 STD				N.A.				
Red. Hips	ROHN TS1.5x11 ga				N.A.				
Inner Bracing	ROHN 3 STD		L3 1/2x3 1/2x1/4	L3x3x3/16	L2 1/2x2 1/2x3/16		L2x2x1/8		
Face Width (ft)	25.1771		22.5417	20.0417	17.5417	14.9583	12.7083	10.625	8.5416
# Panels @ (ft)	1 @ 20			10 @ 10			9 @ 6.66667		
Weight (K)	25.9	4.5	4.4	4.2	3.2	2.8	2.5	1.9	1.5	1.1

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	181.5	DC6-48-60-18-8F	158
8'x2 1/2" Pipe Mount	180	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	158
(3) AIR 21	180		
(6) ATMAA1412D-1A20	180	7770.00 w/ Mount Pipe	158
(2) DB846F65ZAXY w/ Mount Pipe	177	(2) LGP13519	158
BXA-185063/12CFx2 w/ Mount Pipe	177	(2) SBNH-1D6565C w/ Mount Pipe	158
BXA-70040/6CFx4 w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) FD9R6004/2C-3L	177	(2) RRUS-11	158
BXA-70040/6CFx4 w/ Mount Pipe	177	7020.00	158
(2) LPA-80063/6CFx5 w/ Mount Pipe	177	DTMABP7819VG12A	158
APX18-206516L-CT0 w/ Mount Pipe	177	(2) RRUS-11	158
(2) FD9R6004/2C-3L	177	(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	158
BXA-70040/6CFx4 w/ Mount Pipe	177	7020.00	158
APX18-206516L-CT0 w/ Mount Pipe	177	7770.00 w/ Mount Pipe	158
(2) FD9R6004/2C-3L	177	(2) LGP13519	158
(2) SC-E 6014 rev2 w/ Mount Pipe	177	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	158
Sector Mount [SM 502-3]	177		
LLPX310R w/ Mount Pipe	168	Sector Mount [SM 502-3]	158
FDD_R6_RRH	168	Empty Mount Pipe	158
LLPX310R w/ Mount Pipe	168	Empty Mount Pipe	158
FDD_R6_RRH	168	Empty Mount Pipe	158
LLPX310R w/ Mount Pipe	168	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	158
FDD_R6_RRH	168		
Sector Mount [SM 411-3]	168	APXV18-206517S-C w/ Mount Pipe	148
A-ANT-18G-2-C	168	APXV18-206517S-C w/ Mount Pipe	148
7770.00 w/ Mount Pipe	158	APXV18-206517S-C w/ Mount Pipe	148
(2) LGP13519	158	Pipe Mount [PM 602-1]	70
DTMABP7819VG12A	158	HP10-59E	70
(2) RRUS-11	158	GPS_A	40
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	158	Side Arm Mount [SO 201-1]	40
7020.00	158		

MATERIAL STRENGTH

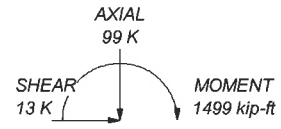
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

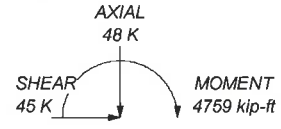
1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 91.1%

MAX. CORNER REACTIONS AT BASE:
DOWN: 214 K
SHEAR: 27 K

UPLIFT: -181 K
SHEAR: 24 K



TORQUE 15 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 47 kip-ft
REACTIONS - 85 mph WIND

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: 9197551012
FAX: 9197551031
Tower Analysis

Job: NHV 108 943133, CT (BU# 806362)			
Project: 13SB411400			
Client: Crown Castle	Drawn by: David Zambrano		App'd:
Code: TIA/EIA-222-F	Date: 09/03/13		Scale: NTS
Path:			Dwg No. E-1

tnxTower	Job	Page
	NHV 108 943133, CT (BU# 806362)	1 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: 9197551012 FAX: 9197551031	**Project** 13SB411400	**Date** 14:20:49 09/03/13
	Client Crown Castle	**Designed by** David Zambrano

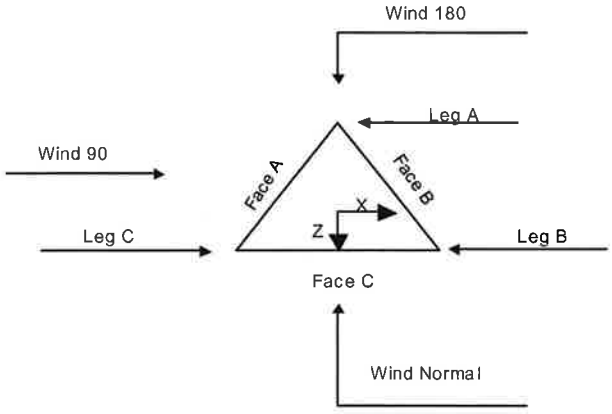
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 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 8.50 ft at the top and 27.68 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
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	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
√ Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	√ Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice Capacity Exemption	



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			8.50	1	20.00
T2	160.00-140.00			8.54	1	20.00
T3	140.00-120.00			10.63	1	20.00
T4	120.00-100.00			12.71	1	20.00
T5	100.00-80.00			14.96	1	20.00
T6	80.00-60.00			17.54	1	20.00
T7	60.00-40.00			20.04	1	20.00
T8	40.00-20.00			22.54	1	20.00
T9	20.00-0.00			25.18	1	20.00

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	180.00-160.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	160.00-140.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T3	140.00-120.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T4	120.00-100.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T5	100.00-80.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T6	80.00-60.00	10.00	K Brace Down	No	Yes	0.0000	0.0000

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
T7	60.00-40.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T8	40.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T9	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 180.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 140.00-120.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 120.00-100.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T5 100.00-80.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 80.00-60.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 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
T1 180.00-160.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 160.00-140.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T3 140.00-120.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T4 120.00-100.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T5 100.00-80.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 60.00-40.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T8 40.00-20.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 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
T9 20.00-0.00	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN TS1.5x11 ga	1
		Diagonal (1)	Pipe	ROHN 1.5 STD	1
		Hip (1)	Pipe	ROHN TS1.5x11 ga	1
		Hip Diagonal		ROHN 2.5 STD	1

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
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

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 180.00-160.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 160.00-140.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 140.00-120.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 120.00-100.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 100.00-80.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 80.00-60.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 60.00-40.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 40.00-20.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 20.00-0.00	No	No	1	1 1	1 1	1 1	1 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		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 180.00-160.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75

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
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T9 20.00-0.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	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 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T2 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T5 100.00-80.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T6 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T7 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T8 40.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T9 20.00-0.00	Flange	1.0000 A449	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0

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 plf
LCF158-50A(1-5/8")	C	Yes	Ar (CfAe)	158.00 - 0.00	-1.0000	-0.4	31	14	1.9800	1.9800		0.80
LCF158-50A(1-5/8")	C	Yes	Ar (CfAe)	180.00 - 158.00	-1.5000	-0.4	19	12	1.9800	1.9800		0.80

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 plf
***												
561(1-5/8")	A	Yes	Ar (CfAe)	177.00 - 0.00	1.0000	-0.35	12	2	1.6250	1.6250		1.35
***												
7983A(1/2")	A	Yes	Ar (CfAe)	168.00 - 0.00	0.0000	0.48	1	1	0.5800	0.0000		0.08
9207(5/16")	A	Yes	Ar (CfAe)	168.00 - 0.00	0.0000	0.48	3	3	0.3300	0.0000		0.60
1 1/2" Rigid Conduit	A	Yes	Ar (CfAe)	168.00 - 0.00	0.0000	0.48	2	2	1.5000	1.5000		1.00
FB-L98B-002-75000(3/8")	C	Yes	Ar (CfAe)	158.00 - 0.00	1.0000	-0.45	1	1	0.3937	0.3937		0.06
WR-VG86ST-BRD(3/4)	C	Yes	Ar (CfAe)	158.00 - 0.00	1.0000	-0.48	2	2	0.7740	0.7740		0.59
***												
LCF158-50JL(1-5/8")	A	Yes	Ar (CfAe)	148.00 - 0.00	0.0000	0.4	6	3	1.9800	1.9800		0.52
***												
EW107(ELLIPTICAL)	A	Yes	Ar (CfAe)	70.00 - 0.00	0.0000	-0.45	1	1	1.1700	1.1700		0.29
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	40.00 - 0.00	0.0000	-0.45	1	1	0.6300	0.6300		0.15
***												
Feedline Ladder (Af) 1.5"	A	Yes	Af (CfAe)	177.00 - 0.00	0.0000	-0.4	1	1	1.5000	1.5000	6.0000	4.20
Feedline Ladder (Af) 1.5"	A	Yes	Af (CfAe)	168.00 - 0.00	0.0000	0.4	1	1	1.5000	1.5000	6.0000	4.20
T-Brackets	A	Yes	Af (CfAe)	177.00 - 0.00	0.0000	-0.35	1	1	1.0000	1.0000	4.0000	8.40
Feedline Ladder (Af)	C	Yes	Af (CfAe)	180.00 - 0.00	-2.0000	-0.4	2	1	3.0000	3.0000	12.0000	8.40
***												

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	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	180.00-160.00	A	6.604	4.542	0.000	0.000	0.55
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	5.000	0.000	0.000	0.64
T2	160.00-140.00	A	14.377	6.667	0.000	0.000	0.76
		B	0.000	0.000	0.000	0.000	0.00
		C	48.453	5.000	0.000	0.000	0.84
T3	140.00-120.00	A	20.317	6.667	0.000	0.000	0.80
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T4	120.00-100.00	A	20.317	6.667	0.000	0.000	0.80

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
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T5	100.00-80.00	A	20.317	6.667	0.000	0.000	0.80
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T6	80.00-60.00	A	21.292	6.667	0.000	0.000	0.80
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T7	60.00-40.00	A	22.267	6.667	0.000	0.000	0.81
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T8	40.00-20.00	A	23.317	6.667	0.000	0.000	0.81
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86
T9	20.00-0.00	A	23.317	6.667	0.000	0.000	0.81
		B	0.000	0.000	0.000	0.000	0.00
		C	49.436	5.000	0.000	0.000	0.86

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	180.00-160.00	A	0.913	9.541	15.847	0.000	0.000	1.44
		B		0.000	0.000	0.000	0.000	0.00
		C		76.122	7.029	0.000	0.000	2.09
T2	160.00-140.00	A	0.899	24.759	24.180	0.000	0.000	2.07
		B		0.000	0.000	0.000	0.000	0.00
		C		94.062	9.321	0.000	0.000	3.02
T3	140.00-120.00	A	0.884	35.738	24.077	0.000	0.000	2.31
		B		0.000	0.000	0.000	0.000	0.00
		C		95.299	9.545	0.000	0.000	3.08
T4	120.00-100.00	A	0.867	35.328	23.961	0.000	0.000	2.29
		B		0.000	0.000	0.000	0.000	0.00
		C		94.364	9.506	0.000	0.000	3.02
T5	100.00-80.00	A	0.846	34.847	23.823	0.000	0.000	2.26
		B		0.000	0.000	0.000	0.000	0.00
		C		93.264	9.460	0.000	0.000	2.95
T6	80.00-60.00	A	0.821	36.604	23.656	0.000	0.000	2.25
		B		0.000	0.000	0.000	0.000	0.00
		C		91.924	9.404	0.000	0.000	2.87
T7	60.00-40.00	A	0.788	43.417	18.022	0.000	0.000	2.02
		B		0.000	0.000	0.000	0.000	0.00
		C		90.191	9.332	0.000	0.000	2.77
T8	40.00-20.00	A	0.750	45.817	17.767	0.000	0.000	1.97
		B		0.000	0.000	0.000	0.000	0.00
		C		88.146	9.247	0.000	0.000	2.65
T9	20.00-0.00	A	0.750	45.817	17.767	0.000	0.000	1.97
		B		0.000	0.000	0.000	0.000	0.00
		C		88.146	9.247	0.000	0.000	2.65

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	180.00-160.00	A	0.879	3.964	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.517	12.123	0.000	0.000
T2	160.00-140.00	A	1.548	6.947	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.931	13.961	0.000	0.000
T3	140.00-120.00	A	1.999	8.112	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	4.033	13.678	0.000	0.000
T4	120.00-100.00	A	1.641	6.218	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.311	10.483	0.000	0.000
T5	100.00-80.00	A	1.536	5.712	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.099	9.629	0.000	0.000
T6	80.00-60.00	A	1.632	5.776	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.177	9.374	0.000	0.000
T7	60.00-40.00	A	1.632	5.595	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.070	8.768	0.000	0.000
T8	40.00-20.00	A	1.847	5.963	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.354	8.864	0.000	0.000
T9	20.00-0.00	A	1.873	6.515	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.400	9.685	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-160.00	10.9176	9.6165	11.6730	9.3577
T2	160.00-140.00	12.1160	8.3241	12.7327	8.1583
T3	140.00-120.00	12.6155	6.6672	13.6801	6.6969
T4	120.00-100.00	14.3493	7.4981	16.2385	7.8227
T5	100.00-80.00	16.5077	8.5481	18.6269	8.8814
T6	80.00-60.00	16.6901	9.0846	19.1309	9.7611
T7	60.00-40.00	17.8558	10.1976	18.3737	11.5398
T8	40.00-20.00	17.9243	10.8190	17.9845	12.6208
T9	20.00-0.00	17.9873	10.8197	18.2006	12.7559

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	K

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	C	None		0.0000	181.50	No Ice	0.25	0.25	0.03
						1/2" Ice	0.66	0.66	0.03
						1" Ice	0.97	0.97	0.04
						2" Ice	1.49	1.49	0.06
						4" Ice	2.68	2.68	0.14
****									
8'x2 1/2" Pipe Mount	B	From Leg	0.00 0.00 4.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.30 3.13 3.62 4.62 6.73	2.30 3.13 3.62 4.62 6.73	0.04 0.06 0.08 0.14 0.33
(3) AIR 21	B	From Leg	0.00 0.00 8.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.42 6.86 7.30 8.22 10.17	4.28 4.69 5.11 5.98 7.82	0.08 0.12 0.17 0.28 0.57
(6) ATMAA1412D-1A20	B	From Leg	0.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
***									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.88 8.48 9.72 12.33	7.82 9.01 9.91 11.81 15.98	0.05 0.11 0.19 0.37 0.87
BXA-185063/12CFx2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.59 6.11 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
BXA-70040/6CFx4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.55 17.27 17.96 19.37 22.30	7.37 8.54 9.42 11.23 15.34	0.06 0.16 0.27 0.52 1.17
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
BXA-70040/6CFx4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.55 17.27 17.96 19.37 22.30	7.37 8.54 9.42 11.23 15.34	0.06 0.16 0.27 0.52 1.17
(2) LPA-80063/6CFx5 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.55 11.21 11.84 13.13 15.83	10.65 11.91 12.88 14.89 19.13	0.05 0.14 0.25 0.48 1.09
APX18-206516L-CT0 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.74 4.16 4.59 5.54 7.57	3.29 4.00 4.66 6.04 9.02	0.04 0.07 0.11 0.21 0.52

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) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
BXA-70040/6CFx4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.55 17.27 17.96 19.37 22.30	7.37 8.54 9.42 11.23 15.34	0.06 0.16 0.27 0.52 1.17
APX18-206516L-CT0 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.74 4.16 4.59 5.54 7.57	3.29 4.00 4.66 6.04 9.02	0.04 0.07 0.11 0.21 0.52
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) SC-E 6014 rev2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.78 4.18 4.59 5.44 7.29	4.40 5.01 5.64 6.96 9.90	0.03 0.07 0.12 0.22 0.54
Sector Mount [SM 502-3]	C	None		0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	33.02 47.36 61.70 90.38 147.74	33.02 47.36 61.70 90.38 147.74	1.67 2.22 2.77 3.88 6.08
***									
LLPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
FDD_R6_RRH	A	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
LLPX310R w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
FDD_R6_RRH	B	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
FDD_R6_RRH	C	From Leg	4.00	0.0000	168.00	No Ice	1.79	0.78	0.03

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
			0.00			1/2" Ice	1.97	0.92	0.04
			0.00			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
Sector Mount [SM 411-3]	C	None		0.0000	168.00	No Ice	21.88	21.88	1.07
						1/2" Ice	30.68	30.68	1.48
						1" Ice	39.48	39.48	1.90
						2" Ice	57.08	57.08	2.73
						4" Ice	92.28	92.28	4.40
***									
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP13519	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.21 0.28 0.36 0.55 1.03	0.01 0.01 0.01 0.02 0.07
DTMABP7819VG12A	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) RRUS-11	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
7020.00	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.02 0.05 0.09 0.17 0.38
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	B	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	158.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	0.06 0.10

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" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) LGP13519	B	From Leg	4.00	0.0000	158.00	No Ice	0.34	0.21	0.01
			0.00			1/2" Ice	0.42	0.28	0.01
			2.00			1" Ice	0.51	0.36	0.01
						2" Ice	0.73	0.55	0.02
						4" Ice	1.25	1.03	0.07
(2) SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00	0.0000	158.00	No Ice	11.68	9.84	0.10
			0.00			1/2" Ice	12.40	11.37	0.19
			2.00			1" Ice	13.14	12.91	0.29
						2" Ice	14.60	15.27	0.52
						4" Ice	17.87	20.14	1.17
DTMABP7819VG12A	B	From Leg	4.00	0.0000	158.00	No Ice	1.14	0.39	0.02
			0.00			1/2" Ice	1.28	0.49	0.03
			2.00			1" Ice	1.44	0.59	0.04
						2" Ice	1.77	0.83	0.06
						4" Ice	2.54	1.41	0.14
(2) RRUS-11	B	From Leg	4.00	0.0000	158.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
			2.00			1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
7020.00	B	From Leg	4.00	0.0000	158.00	No Ice	0.12	0.20	0.00
			0.00			1/2" Ice	0.17	0.28	0.01
			2.00			1" Ice	0.23	0.36	0.01
						2" Ice	0.38	0.56	0.02
						4" Ice	0.78	1.05	0.07
DTMABP7819VG12A	C	From Leg	4.00	0.0000	158.00	No Ice	1.14	0.39	0.02
			0.00			1/2" Ice	1.28	0.49	0.03
			2.00			1" Ice	1.44	0.59	0.04
						2" Ice	1.77	0.83	0.06
						4" Ice	2.54	1.41	0.14
(2) RRUS-11	C	From Leg	4.00	0.0000	158.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
			2.00			1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.0000	158.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			2.00			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
7020.00	C	From Leg	4.00	0.0000	158.00	No Ice	0.12	0.20	0.00
			0.00			1/2" Ice	0.17	0.28	0.01
			2.00			1" Ice	0.23	0.36	0.01
						2" Ice	0.38	0.56	0.02
						4" Ice	0.78	1.05	0.07
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	158.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) LGP13519	C	From Leg	4.00	0.0000	158.00	No Ice	0.34	0.21	0.01
			0.00			1/2" Ice	0.42	0.28	0.01
			2.00			1" Ice	0.51	0.36	0.01
						2" Ice	0.73	0.55	0.02

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
						4" Ice	1.25	1.03	0.07
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	C	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
Sector Mount [SM 502-3]	C	None		0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	33.02 47.36 61.70 90.38 147.74	33.02 47.36 61.70 90.38 147.74	1.67 2.22 2.77 3.88 6.08
***									
Empty Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	0.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	B	From Leg	0.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	0.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
***									
***									
Pipe Mount [PM 602-1]	A	From Leg	0.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.25 6.50 7.75 10.25 15.25	1.58 1.95 2.32 3.06 4.54	0.09 0.12 0.14 0.19 0.29
***									
GPS_A	A	From Leg	1.00 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 201-1]	A	From Leg	0.00	0.0000	40.00	No Ice	2.96	2.11	0.10

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
			0.00			1/2" Ice	4.10	2.93	0.12
			0.00			1" Ice	5.24	3.75	0.14
						2" Ice	7.52	5.39	0.18
						4" Ice	12.08	8.67	0.26
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-18G-2-C	C	Paraboloid w/o Radome	From Leg	3.00	90.0000		168.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05
				0.00					1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.19
***											
***											
HP10-59E	A	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		70.00	10.00	No Ice	78.54	0.32
				0.00					1/2" Ice	79.85	0.73
				0.00					1" Ice	81.17	1.14
									2" Ice	83.80	1.96
									4" Ice	89.06	3.60
***											

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.00	1.597	30	175.208	A	4.542	28.372	9.583	29.12	0.000	0.000
180.00-160.00					B	0.000	22.647		42.32	0.000	0.000
					C	5.000	58.730		15.04	0.000	0.000
T2	150.00	1.541	29	197.508	A	6.667	38.361	11.688	25.96	0.000	0.000
160.00-140.00					B	0.000	25.532		45.78	0.000	0.000
					C	5.000	70.053		15.57	0.000	0.000
T3	130.00	1.48	27	240.843	A	6.667	50.188	15.027	26.43	0.000	0.000
140.00-120.00					B	0.000	31.871		47.15	0.000	0.000
					C	5.000	77.274		18.26	0.000	0.000
T4	110.00	1.411	26	285.953	A	6.667	53.778	18.582	30.74	0.000	0.000
120.00-100.00					B	0.000	35.103		52.94	0.000	0.000
					C	5.000	81.228		21.55	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T5	90.00	1.332	25	334.291	A	6.667	55.577	18.595	29.87	0.000	0.000
100.00-80.00					B	0.000	36.796		50.53	0.000	0.000
					C	5.000	83.133		21.10	0.000	0.000
T6 80.00-60.00	70.00	1.24	23	386.897	A	6.667	63.245	22.141	31.67	0.000	0.000
					B	0.000	43.585		50.80	0.000	0.000
					C	5.000	89.844		23.34	0.000	0.000
T7 60.00-40.00	50.00	1.126	21	436.897	A	6.667	66.278	22.141	30.35	0.000	0.000
					B	0.000	45.644		48.51	0.000	0.000
					C	5.000	92.010		22.82	0.000	0.000
T8 40.00-20.00	30.00	1	18	488.253	A	6.667	72.517	22.147	27.97	0.000	0.000
					B	0.000	51.048		43.38	0.000	0.000
					C	5.000	97.131		21.69	0.000	0.000
T9 20.00-0.00	10.00	1	18	542.945	A	6.667	84.235	28.825	31.71	0.000	0.000
					B	0.000	59.180		48.71	0.000	0.000
					C	5.000	101.604		27.04	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	6	0.9130	178.252	A	15.847	45.111	15.670	25.71	0.000	0.000
180.00-160.00						B	0.000	39.534		39.64	0.000	0.000
						C	7.029	103.533		14.17	0.000	0.000
T2	150.00	1.541	6	0.8994	200.510	A	24.180	60.643	17.695	20.86	0.000	0.000
160.00-140.00						B	0.000	42.831		41.31	0.000	0.000
						C	9.321	122.932		13.38	0.000	0.000
T3	130.00	1.48	5	0.8841	243.795	A	24.077	77.942	20.932	20.52	0.000	0.000
140.00-120.00						B	0.000	50.316		41.60	0.000	0.000
						C	9.545	131.937		14.79	0.000	0.000
T4	110.00	1.411	5	0.8666	288.846	A	23.961	80.608	24.372	23.31	0.000	0.000
120.00-100.00						B	0.000	51.497		47.33	0.000	0.000
						C	9.506	135.377		16.82	0.000	0.000
T5 100.00-80.00	90.00	1.332	5	0.8460	337.117	A	23.823	83.041	24.250	22.69	0.000	0.000
						B	0.000	53.905		44.99	0.000	0.000
						C	9.460	137.540		16.50	0.000	0.000
T6 80.00-60.00	70.00	1.24	4	0.8208	389.638	A	23.656	92.145	27.627	23.86	0.000	0.000
						B	0.000	61.317		45.06	0.000	0.000
						C	9.404	143.866		18.03	0.000	0.000
T7 60.00-40.00	50.00	1.126	4	0.7883	439.529	A	18.022	101.624	27.410	22.91	0.000	0.000
						B	0.000	63.802		42.96	0.000	0.000
						C	9.332	145.225		17.73	0.000	0.000
T8 40.00-20.00	30.00	1	4	0.7500	490.759	A	17.767	109.313	27.162	21.37	0.000	0.000
						B	0.000	69.460		39.10	0.000	0.000
						C	9.247	148.742		17.19	0.000	0.000
T9 20.00-0.00	10.00	1	4	0.7500	545.450	A	17.767	124.883	33.838	23.72	0.000	0.000
						B	0.000	80.086		42.25	0.000	0.000
						C	9.247	153.052		20.85	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	10	175.208	A	4.542	28.372	9.583	29.12	0.000	0.000
180.00-160.00					B	0.000	22.647		42.32	0.000	0.000
					C	5.000	58.730		15.04	0.000	0.000
T2	150.00	1.541	10	197.508	A	6.667	38.361	11.688	25.96	0.000	0.000
160.00-140.00					B	0.000	25.532		45.78	0.000	0.000
					C	5.000	70.053		15.57	0.000	0.000
T3	130.00	1.48	9	240.843	A	6.667	50.188	15.027	26.43	0.000	0.000
140.00-120.00					B	0.000	31.871		47.15	0.000	0.000
					C	5.000	77.274		18.26	0.000	0.000
T4	110.00	1.411	9	285.953	A	6.667	53.778	18.582	30.74	0.000	0.000
120.00-100.00					B	0.000	35.103		52.94	0.000	0.000
					C	5.000	81.228		21.55	0.000	0.000
T5	90.00	1.332	9	334.291	A	6.667	55.577	18.595	29.87	0.000	0.000
100.00-80.00					B	0.000	36.796		50.53	0.000	0.000
					C	5.000	83.133		21.10	0.000	0.000
T6 80.00-60.00	70.00	1.24	8	386.897	A	6.667	63.245	22.141	31.67	0.000	0.000
					B	0.000	43.585		50.80	0.000	0.000
					C	5.000	89.844		23.34	0.000	0.000
T7 60.00-40.00	50.00	1.126	7	436.897	A	6.667	66.278	22.141	30.35	0.000	0.000
					B	0.000	45.644		48.51	0.000	0.000
					C	5.000	92.010		22.82	0.000	0.000
T8 40.00-20.00	30.00	1	6	488.253	A	6.667	72.517	22.147	27.97	0.000	0.000
					B	0.000	51.048		43.38	0.000	0.000
					C	5.000	97.131		21.69	0.000	0.000
T9 20.00-0.00	10.00	1	6	542.945	A	6.667	84.235	28.825	31.71	0.000	0.000
					B	0.000	59.180		48.71	0.000	0.000
					C	5.000	101.604		27.04	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	1	1	21.225	3.01	150.40	C
180.00-160.00			B	0.129	2.849	0.579	1	1	13.102			
			C	0.364	2.14	0.637	1	1	42.439			
T2	1.60	1.46	A	0.228	2.505	0.597	1	1	29.549	3.37	168.45	C
160.00-140.00			B	0.129	2.849	0.579	1	1	14.771			
			C	0.38	2.105	0.644	1	1	50.089			
T3	1.66	1.95	A	0.236	2.48	0.598	1	1	36.700	3.61	180.28	C
140.00-120.00			B	0.132	2.838	0.579	1	1	18.451			
			C	0.342	2.191	0.63	1	1	53.645			
T4	1.66	2.47	A	0.211	2.558	0.593	1	1	38.546	3.69	184.54	C
120.00-100.00			B	0.123	2.874	0.578	1	1	20.278			
			C	0.302	2.292	0.616	1	1	55.067			
T5	1.66	2.65	A	0.186	2.643	0.588	1	1	39.328	3.66	183.14	C
100.00-80.00			B	0.11	2.924	0.576	1	1	21.201			
			C	0.264	2.397	0.605	1	1	55.333			
T6	1.66	3.18	A	0.181	2.662	0.587	1	1	43.770	3.72	185.80	C
80.00-60.00			B	0.113	2.914	0.576	1	1	25.126			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.245	2.452	0.601	1	1	58.965			
T7	1.66	4.16	A	0.167	2.71	0.584	1	1	45.388	3.52	176.06	C
60.00-40.00			B	0.104	2.946	0.576	1	1	26.271			
			C	0.222	2.524	0.595	1	1	59.759			
T8	1.67	4.37	A	0.162	2.727	0.583	1	1	48.974	3.33	166.30	C
40.00-20.00			B	0.105	2.946	0.576	1	1	29.382			
			C	0.209	2.566	0.592	1	1	62.532			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	1	1	55.885	3.51	175.50	C
			B	0.109	2.928	0.576	1	1	34.091			
			C	0.196	2.608	0.59	1	1	64.912			
Sum Weight:	14.42	25.88						OTM	2792.13 kip-ft	31.41		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	0.8	1	20.316	2.94	146.86	C
180.00-160.00			B	0.129	2.849	0.579	0.8	1	13.102			
			C	0.364	2.14	0.637	0.8	1	41.439			
T2	1.60	1.46	A	0.228	2.505	0.597	0.8	1	28.216	3.30	165.09	C
160.00-140.00			B	0.129	2.849	0.579	0.8	1	14.771			
			C	0.38	2.105	0.644	0.8	1	49.089			
T3	1.66	1.95	A	0.236	2.48	0.598	0.8	1	35.367	3.54	176.92	C
140.00-120.00			B	0.132	2.838	0.579	0.8	1	18.451			
			C	0.342	2.191	0.63	0.8	1	52.645			
T4	1.66	2.47	A	0.211	2.558	0.593	0.8	1	37.212	3.62	181.19	C
120.00-100.00			B	0.123	2.874	0.578	0.8	1	20.278			
			C	0.302	2.292	0.616	0.8	1	54.067			
T5	1.66	2.65	A	0.186	2.643	0.588	0.8	1	37.995	3.60	179.83	C
100.00-80.00			B	0.11	2.924	0.576	0.8	1	21.201			
			C	0.264	2.397	0.605	0.8	1	54.333			
T6	1.66	3.18	A	0.181	2.662	0.587	0.8	1	42.436	3.65	182.65	C
80.00-60.00			B	0.113	2.914	0.576	0.8	1	25.126			
			C	0.245	2.452	0.601	0.8	1	57.965			
T7	1.66	4.16	A	0.167	2.71	0.584	0.8	1	44.054	3.46	173.11	C
60.00-40.00			B	0.104	2.946	0.576	0.8	1	26.271			
			C	0.222	2.524	0.595	0.8	1	58.759			
T8	1.67	4.37	A	0.162	2.727	0.583	0.8	1	47.641	3.27	163.64	C
40.00-20.00			B	0.105	2.946	0.576	0.8	1	29.382			
			C	0.209	2.566	0.592	0.8	1	61.532			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	0.8	1	54.551	3.46	172.80	C
			B	0.109	2.928	0.576	0.8	1	34.091			
			C	0.196	2.608	0.59	0.8	1	63.912			
Sum Weight:	14.42	25.88						OTM	2738.43 kip-ft	30.84		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	0.85	1	20.543	2.95	147.74	C
180.00-160.00			B	0.129	2.849	0.579	0.85	1	13.102			
			C	0.364	2.14	0.637	0.85	1	41.689			
T2	1.60	1.46	A	0.228	2.505	0.597	0.85	1	28.549	3.32	165.93	C
160.00-140.00			B	0.129	2.849	0.579	0.85	1	14.771			
			C	0.38	2.105	0.644	0.85	1	49.339			
T3	1.66	1.95	A	0.236	2.48	0.598	0.85	1	35.700	3.56	177.76	C
140.00-120.00			B	0.132	2.838	0.579	0.85	1	18.451			
			C	0.342	2.191	0.63	0.85	1	52.895			
T4	1.66	2.47	A	0.211	2.558	0.593	0.85	1	37.546	3.64	182.02	C
120.00-100.00			B	0.123	2.874	0.578	0.85	1	20.278			
			C	0.302	2.292	0.616	0.85	1	54.317			
T5	1.66	2.65	A	0.186	2.643	0.588	0.85	1	38.328	3.61	180.66	C
100.00-80.00			B	0.11	2.924	0.576	0.85	1	21.201			
			C	0.264	2.397	0.605	0.85	1	54.583			
T6	1.66	3.18	A	0.181	2.662	0.587	0.85	1	42.770	3.67	183.44	C
80.00-60.00			B	0.113	2.914	0.576	0.85	1	25.126			
			C	0.245	2.452	0.601	0.85	1	58.215			
T7	1.66	4.16	A	0.167	2.71	0.584	0.85	1	44.388	3.48	173.85	C
60.00-40.00			B	0.104	2.946	0.576	0.85	1	26.271			
			C	0.222	2.524	0.595	0.85	1	59.009			
T8	1.67	4.37	A	0.162	2.727	0.583	0.85	1	47.974	3.29	164.31	C
40.00-20.00			B	0.105	2.946	0.576	0.85	1	29.382			
			C	0.209	2.566	0.592	0.85	1	61.782			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	0.85	1	54.885	3.47	173.47	C
			B	0.109	2.928	0.576	0.85	1	34.091			
			C	0.196	2.608	0.59	0.85	1	64.162			
Sum Weight:	14.42	25.88						OTM	2751.85 kip-ft	30.98		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	3.53	2.31	A	0.342	2.19	0.63	1	1	44.251	1.00	50.16	C
180.00-160.00			B	0.222	2.525	0.595	1	1	23.526			
			C	0.62	1.793	0.766	1	1	86.356			
T2	5.09	2.71	A	0.423	2.02	0.661	1	1	64.281	1.19	59.33	C
160.00-140.00			B	0.214	2.551	0.593	1	1	25.410			
			C	0.66	1.779	0.792	1	1	106.667			
T3	5.39	3.43	A	0.418	2.029	0.659	1	1	75.465	1.17	58.58	C
140.00-120.00			B	0.206	2.575	0.592	1	1	29.773			
			C	0.58	1.818	0.742	1	1	107.410			
T4	5.31	3.89	A	0.362	2.144	0.637	1	1	75.295	1.13	56.50	C
120.00-100.00			B	0.178	2.67	0.586	1	1	30.188			
			C	0.502	1.898	0.698	1	1	104.041			
T5	5.21	4.17	A	0.317	2.252	0.621	1	1	75.412	1.09	54.60	C
100.00-80.00			B	0.16	2.735	0.583	1	1	31.429			
			C	0.436	1.997	0.667	1	1	101.195			
T6	5.12	4.92	A	0.297	2.303	0.615	1	1	80.329	1.07	53.68	C
80.00-60.00			B	0.157	2.745	0.583	1	1	35.725			
			C	0.393	2.077	0.649	1	1	102.761			
T7	4.79	5.98	A	0.272	2.373	0.608	1	1	79.789	1.00	50.14	C
60.00-40.00			B	0.145	2.789	0.581	1	1	37.053			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.352	2.168	0.633	1	1	101.269			
T8	4.62	6.32	A	0.259	2.411	0.604	1	1	83.813	0.93	46.28	C
40.00-20.00			B	0.142	2.803	0.58	1	1	40.302			
			C	0.322	2.239	0.623	1	1	101.891			
T9 20.00-0.00	4.62	6.47	A	0.262	2.403	0.605	1	1	93.306	0.97	48.29	C
			B	0.147	2.783	0.581	1	1	46.530			
			C	0.298	2.303	0.615	1	1	103.397			
Sum Weight:	43.68	40.20						OTM	886.14 kip-ft	9.55		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	3.53	2.31	A	0.342	2.19	0.63	0.8	1	41.082	0.99	49.35	C
180.00-160.00			B	0.222	2.525	0.595	0.8	1	23.526			
			C	0.62	1.793	0.766	0.8	1	84.951			
T2	5.09	2.71	A	0.423	2.02	0.661	0.8	1	59.445	1.17	58.29	C
160.00-140.00			B	0.214	2.551	0.593	0.8	1	25.410			
			C	0.66	1.779	0.792	0.8	1	104.803			
T3	5.39	3.43	A	0.418	2.029	0.659	0.8	1	70.649	1.15	57.54	C
140.00-120.00			B	0.206	2.575	0.592	0.8	1	29.773			
			C	0.58	1.818	0.742	0.8	1	105.501			
T4	5.31	3.89	A	0.362	2.144	0.637	0.8	1	70.503	1.11	55.46	C
120.00-100.00			B	0.178	2.67	0.586	0.8	1	30.188			
			C	0.502	1.898	0.698	0.8	1	102.140			
T5	5.21	4.17	A	0.317	2.252	0.621	0.8	1	70.647	1.07	53.58	C
100.00-80.00			B	0.16	2.735	0.583	0.8	1	31.429			
			C	0.436	1.997	0.667	0.8	1	99.303			
T6	5.12	4.92	A	0.297	2.303	0.615	0.8	1	75.598	1.05	52.69	C
80.00-60.00			B	0.157	2.745	0.583	0.8	1	35.725			
			C	0.393	2.077	0.649	0.8	1	100.880			
T7	4.79	5.98	A	0.272	2.373	0.608	0.8	1	76.184	0.98	49.21	C
60.00-40.00			B	0.145	2.789	0.581	0.8	1	37.053			
			C	0.352	2.168	0.633	0.8	1	99.402			
T8	4.62	6.32	A	0.259	2.411	0.604	0.8	1	80.260	0.91	45.44	C
40.00-20.00			B	0.142	2.803	0.58	0.8	1	40.302			
			C	0.322	2.239	0.623	0.8	1	100.042			
T9 20.00-0.00	4.62	6.47	A	0.262	2.403	0.605	0.8	1	89.753	0.95	47.43	C
			B	0.147	2.783	0.581	0.8	1	46.530			
			C	0.298	2.303	0.615	0.8	1	101.548			
Sum Weight:	43.68	40.20						OTM	870.46 kip-ft	9.38		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	3.53	2.31	A	0.342	2.19	0.63	0.85	1	41.874	0.99	49.55	C
180.00-160.00			B	0.222	2.525	0.595	0.85	1	23.526			
			C	0.62	1.793	0.766	0.85	1	85.302			
T2	5.09	2.71	A	0.423	2.02	0.661	0.85	1	60.654	1.17	58.55	C
160.00-140.00			B	0.214	2.551	0.593	0.85	1	25.410			
			C	0.66	1.779	0.792	0.85	1	105.269			
T3	5.39	3.43	A	0.418	2.029	0.659	0.85	1	71.853	1.16	57.80	C
140.00-120.00			B	0.206	2.575	0.592	0.85	1	29.773			
			C	0.58	1.818	0.742	0.85	1	105.979			
T4	5.31	3.89	A	0.362	2.144	0.637	0.85	1	71.701	1.11	55.72	C
120.00-100.00			B	0.178	2.67	0.586	0.85	1	30.188			
			C	0.502	1.898	0.698	0.85	1	102.616			
T5	5.21	4.17	A	0.317	2.252	0.621	0.85	1	71.839	1.08	53.83	C
100.00-80.00			B	0.16	2.735	0.583	0.85	1	31.429			
			C	0.436	1.997	0.667	0.85	1	99.776			
T6	5.12	4.92	A	0.297	2.303	0.615	0.85	1	76.780	1.06	52.94	C
80.00-60.00			B	0.157	2.745	0.583	0.85	1	35.725			
			C	0.393	2.077	0.649	0.85	1	101.350			
T7	4.79	5.98	A	0.272	2.373	0.608	0.85	1	77.085	0.99	49.45	C
60.00-40.00			B	0.145	2.789	0.581	0.85	1	37.053			
			C	0.352	2.168	0.633	0.85	1	99.869			
T8	4.62	6.32	A	0.259	2.411	0.604	0.85	1	81.148	0.91	45.65	C
40.00-20.00			B	0.142	2.803	0.58	0.85	1	40.302			
			C	0.322	2.239	0.623	0.85	1	100.504			
T9 20.00-0.00	4.62	6.47	A	0.262	2.403	0.605	0.85	1	90.641	0.95	47.64	C
			B	0.147	2.783	0.581	0.85	1	46.530			
			C	0.298	2.303	0.615	0.85	1	102.010			
Sum Weight:	43.68	40.20						OTM	874.38 kip-ft	9.42		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	1	1	21.225	1.04	52.04	C
180.00-160.00			B	0.129	2.849	0.579	1	1	13.102			
			C	0.364	2.14	0.637	1	1	42.439			
T2	1.60	1.46	A	0.228	2.505	0.597	1	1	29.549	1.17	58.29	C
160.00-140.00			B	0.129	2.849	0.579	1	1	14.771			
			C	0.38	2.105	0.644	1	1	50.089			
T3	1.66	1.95	A	0.236	2.48	0.598	1	1	36.700	1.25	62.38	C
140.00-120.00			B	0.132	2.838	0.579	1	1	18.451			
			C	0.342	2.191	0.63	1	1	53.645			
T4	1.66	2.47	A	0.211	2.558	0.593	1	1	38.546	1.28	63.85	C
120.00-100.00			B	0.123	2.874	0.578	1	1	20.278			
			C	0.302	2.292	0.616	1	1	55.067			
T5	1.66	2.65	A	0.186	2.643	0.588	1	1	39.328	1.27	63.37	C
100.00-80.00			B	0.11	2.924	0.576	1	1	21.201			
			C	0.264	2.397	0.605	1	1	55.333			
T6	1.66	3.18	A	0.181	2.662	0.587	1	1	43.770	1.29	64.29	C
80.00-60.00			B	0.113	2.914	0.576	1	1	25.126			
			C	0.245	2.452	0.601	1	1	58.965			
T7	1.66	4.16	A	0.167	2.71	0.584	1	1	45.388	1.22	60.92	C
60.00-40.00			B	0.104	2.946	0.576	1	1	26.271			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.222	2.524	0.595	1	1	59.759			
T8	1.67	4.37	A	0.162	2.727	0.583	1	1	48.974	1.15	57.54	C
40.00-20.00			B	0.105	2.946	0.576	1	1	29.382			
			C	0.209	2.566	0.592	1	1	62.532			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	1	1	55.885	1.21	60.73	C
			B	0.109	2.928	0.576	1	1	34.091			
			C	0.196	2.608	0.59	1	1	64.912			
Sum Weight:	14.42	25.88						OTM	966.13 kip-ft	10.87		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	0.8	1	20.316	1.02	50.82	C
180.00-160.00			B	0.129	2.849	0.579	0.8	1	13.102			
			C	0.364	2.14	0.637	0.8	1	41.439			
T2	1.60	1.46	A	0.228	2.505	0.597	0.8	1	28.216	1.14	57.12	C
160.00-140.00			B	0.129	2.849	0.579	0.8	1	14.771			
			C	0.38	2.105	0.644	0.8	1	49.089			
T3	1.66	1.95	A	0.236	2.48	0.598	0.8	1	35.367	1.22	61.22	C
140.00-120.00			B	0.132	2.838	0.579	0.8	1	18.451			
			C	0.342	2.191	0.63	0.8	1	52.645			
T4	1.66	2.47	A	0.211	2.558	0.593	0.8	1	37.212	1.25	62.69	C
120.00-100.00			B	0.123	2.874	0.578	0.8	1	20.278			
			C	0.302	2.292	0.616	0.8	1	54.067			
T5	1.66	2.65	A	0.186	2.643	0.588	0.8	1	37.995	1.24	62.23	C
100.00-80.00			B	0.11	2.924	0.576	0.8	1	21.201			
			C	0.264	2.397	0.605	0.8	1	54.333			
T6	1.66	3.18	A	0.181	2.662	0.587	0.8	1	42.436	1.26	63.20	C
80.00-60.00			B	0.113	2.914	0.576	0.8	1	25.126			
			C	0.245	2.452	0.601	0.8	1	57.965			
T7	1.66	4.16	A	0.167	2.71	0.584	0.8	1	44.054	1.20	59.90	C
60.00-40.00			B	0.104	2.946	0.576	0.8	1	26.271			
			C	0.222	2.524	0.595	0.8	1	58.759			
T8	1.67	4.37	A	0.162	2.727	0.583	0.8	1	47.641	1.13	56.62	C
40.00-20.00			B	0.105	2.946	0.576	0.8	1	29.382			
			C	0.209	2.566	0.592	0.8	1	61.532			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	0.8	1	54.551	1.20	59.79	C
			B	0.109	2.928	0.576	0.8	1	34.091			
			C	0.196	2.608	0.59	0.8	1	63.912			
Sum Weight:	14.42	25.88						OTM	947.55 kip-ft	10.67		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.19	1.14	A	0.188	2.637	0.588	0.85	1	20.543	1.02	51.12	C
180.00-160.00			B	0.129	2.849	0.579	0.85	1	13.102			
			C	0.364	2.14	0.637	0.85	1	41.689			
T2	1.60	1.46	A	0.228	2.505	0.597	0.85	1	28.549	1.15	57.41	C
160.00-140.00			B	0.129	2.849	0.579	0.85	1	14.771			
			C	0.38	2.105	0.644	0.85	1	49.339			
T3	1.66	1.95	A	0.236	2.48	0.598	0.85	1	35.700	1.23	61.51	C
140.00-120.00			B	0.132	2.838	0.579	0.85	1	18.451			
			C	0.342	2.191	0.63	0.85	1	52.895			
T4	1.66	2.47	A	0.211	2.558	0.593	0.85	1	37.546	1.26	62.98	C
120.00-100.00			B	0.123	2.874	0.578	0.85	1	20.278			
			C	0.302	2.292	0.616	0.85	1	54.317			
T5	1.66	2.65	A	0.186	2.643	0.588	0.85	1	38.328	1.25	62.51	C
100.00-80.00			B	0.11	2.924	0.576	0.85	1	21.201			
			C	0.264	2.397	0.605	0.85	1	54.583			
T6	1.66	3.18	A	0.181	2.662	0.587	0.85	1	42.770	1.27	63.47	C
80.00-60.00			B	0.113	2.914	0.576	0.85	1	25.126			
			C	0.245	2.452	0.601	0.85	1	58.215			
T7	1.66	4.16	A	0.167	2.71	0.584	0.85	1	44.388	1.20	60.16	C
60.00-40.00			B	0.104	2.946	0.576	0.85	1	26.271			
			C	0.222	2.524	0.595	0.85	1	59.009			
T8	1.67	4.37	A	0.162	2.727	0.583	0.85	1	47.974	1.14	56.85	C
40.00-20.00			B	0.105	2.946	0.576	0.85	1	29.382			
			C	0.209	2.566	0.592	0.85	1	61.782			
T9 20.00-0.00	1.67	4.51	A	0.167	2.708	0.584	0.85	1	54.885	1.20	60.02	C
			B	0.109	2.928	0.576	0.85	1	34.091			
			C	0.196	2.608	0.59	0.85	1	64.162			
Sum Weight:	14.42	25.88						OTM	952.20 kip-ft	10.72		

Discrete Appurtenance Pressures - No Ice $G_H = 1.121$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
Lightning Rod	0.0000	0.03	0.00	0.00	181.50	1.628	30	0.25	0.25
8'x2 1/2" Pipe Mount	120.0000	0.04	4.25	2.45	184.00	1.634	30	2.30	2.30
AIR 21	120.0000	0.24	4.25	2.45	188.00	1.644	30	19.25	12.83
ATMAA1412D-1A20	120.0000	0.06	4.25	2.45	180.00	1.624	30	7.00	2.80
DB846F65ZAXY w/ Mount Pipe	0.0000	0.10	0.00	-8.91	177.00	1.616	30	14.54	15.64
BXA-185063/12CFx2 w/ Mount Pipe	0.0000	0.04	0.00	-8.91	177.00	1.616	30	5.03	5.29
BXA-70040/6CFx4 w/ Mount Pipe	0.0000	0.06	0.00	-8.91	177.00	1.616	30	16.55	7.37
FD9R6004/2C-3L	0.0000	0.01	0.00	-8.91	177.00	1.616	30	0.73	0.17
BXA-70040/6CFx4 w/ Mount Pipe	120.0000	0.06	7.72	4.46	177.00	1.616	30	16.55	7.37
LPA-80063/6CFx5 w/ Mount Pipe	120.0000	0.10	7.72	4.46	177.00	1.616	30	21.09	21.29
APX18-206516L-CT0 w/ Mount Pipe	120.0000	0.04	7.72	4.46	177.00	1.616	30	3.74	3.29
FD9R6004/2C-3L	120.0000	0.01	7.72	4.46	177.00	1.616	30	0.73	0.17
BXA-70040/6CFx4 w/ Mount Pipe	240.0000	0.06	-7.72	4.46	177.00	1.616	30	16.55	7.37
APX18-206516L-CT0 w/	240.0000	0.04	-7.72	4.46	177.00	1.616	30	3.74	3.29

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Mount Pipe									
FD9R6004/2C-3L	240.0000	0.01	-7.72	4.46	177.00	1.616	30	0.73	0.17
SC-E 6014 rev2 w/ Mount Pipe	240.0000	0.06	-7.72	4.46	177.00	1.616	30	7.57	8.79
Sector Mount [SM 502-3]	0.0000	1.67	0.00	0.00	177.00	1.616	30	33.02	33.02
LLPX310R w/ Mount Pipe	0.0000	0.05	0.00	-8.92	168.00	1.592	29	5.07	2.98
FDD_R6_RRH	0.0000	0.03	0.00	-8.92	168.00	1.592	29	1.79	0.78
LLPX310R w/ Mount Pipe	120.0000	0.05	7.73	4.46	168.00	1.592	29	5.07	2.98
FDD_R6_RRH	120.0000	0.03	7.73	4.46	168.00	1.592	29	1.79	0.78
LLPX310R w/ Mount Pipe	240.0000	0.05	-7.73	4.46	168.00	1.592	29	5.07	2.98
FDD_R6_RRH	240.0000	0.03	-7.73	4.46	168.00	1.592	29	1.79	0.78
Sector Mount [SM 411-3]	0.0000	1.07	0.00	0.00	168.00	1.592	29	21.88	21.88
DUAL BAND 800/1900 FULL BAND MASTHEAD	0.0000	0.06	0.00	-9.05	160.00	1.570	29	3.10	1.62
7770.00 w/ Mount Pipe	0.0000	0.06	0.00	-9.05	160.00	1.570	29	6.12	4.25
LGP13519	0.0000	0.01	0.00	-9.05	160.00	1.570	29	0.68	0.41
DTMABP7819VG12A	0.0000	0.02	0.00	-9.05	160.00	1.570	29	1.14	0.39
RRUS-11	0.0000	0.12	0.00	-9.05	160.00	1.570	29	5.88	2.49
AM-X-CD-16-65-00T-RET w/ Mount Pipe	0.0000	0.14	0.00	-9.05	160.00	1.570	29	17.00	12.61
7020.00	0.0000	0.00	0.00	-9.05	160.00	1.570	29	0.12	0.20
DC6-48-60-18-8F	0.0000	0.02	0.00	-9.05	160.00	1.570	29	2.57	4.32
DUAL BAND 800/1900 FULL BAND MASTHEAD	120.0000	0.06	7.84	4.53	160.00	1.570	29	3.10	1.62
7770.00 w/ Mount Pipe	120.0000	0.06	7.84	4.53	160.00	1.570	29	6.12	4.25
LGP13519	120.0000	0.01	7.84	4.53	160.00	1.570	29	0.68	0.41
SBNH-1D6565C w/ Mount Pipe	120.0000	0.20	7.84	4.53	160.00	1.570	29	23.37	19.68
DTMABP7819VG12A	120.0000	0.02	7.84	4.53	160.00	1.570	29	1.14	0.39
RRUS-11	120.0000	0.12	7.84	4.53	160.00	1.570	29	5.88	2.49
7020.00	120.0000	0.00	7.84	4.53	160.00	1.570	29	0.12	0.20
DTMABP7819VG12A	240.0000	0.02	-7.84	4.53	160.00	1.570	29	1.14	0.39
RRUS-11	240.0000	0.12	-7.84	4.53	160.00	1.570	29	5.88	2.49
AM-X-CD-16-65-00T-RET w/ Mount Pipe	240.0000	0.14	-7.84	4.53	160.00	1.570	29	17.00	12.61
7020.00	240.0000	0.00	-7.84	4.53	160.00	1.570	29	0.12	0.20
7770.00 w/ Mount Pipe	240.0000	0.06	-7.84	4.53	160.00	1.570	29	6.12	4.25
LGP13519	240.0000	0.01	-7.84	4.53	160.00	1.570	29	0.68	0.41
DUAL BAND 800/1900 FULL BAND MASTHEAD	240.0000	0.06	-7.84	4.53	160.00	1.570	29	3.10	1.62
Sector Mount [SM 502-3]	0.0000	1.67	0.00	0.00	158.00	1.564	29	33.02	33.02
Empty Mount Pipe	0.0000	0.03	0.00	-9.05	160.00	1.570	29	1.40	1.40
Empty Mount Pipe	120.0000	0.03	7.84	4.53	160.00	1.570	29	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-7.84	4.53	160.00	1.570	29	1.40	1.40
APXV18-206517S-C w/ Mount Pipe	0.0000	0.05	0.00	-6.15	148.00	1.535	28	5.40	4.70
APXV18-206517S-C w/ Mount Pipe	120.0000	0.05	5.33	3.08	148.00	1.535	28	5.40	4.70
APXV18-206517S-C w/ Mount Pipe	240.0000	0.05	-5.33	3.08	148.00	1.535	28	5.40	4.70
Pipe Mount [PM 602-1]	0.0000	0.09	0.00	-11.35	70.00	1.240	23	5.25	1.58
GPS_A	0.0000	0.00	0.00	-14.01	40.00	1.057	20	0.30	0.30

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Side Arm Mount [SO 201-1]	0.0000	0.10	0.00	-13.01	40.00	1.057	20	2.96	2.11
	Sum Weight:	7.35							

Discrete Appurtenance Pressures - With Ice $G_H = 1.121$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Lightning Rod	0.0000	0.04	0.00	0.00	181.50	1.628	6	0.92	0.92	0.9202
8'x2 1/2" Pipe Mount	120.0000	0.08	4.25	2.45	184.00	1.634	6	3.54	3.54	0.9193
AIR 21	120.0000	0.49	4.25	2.45	188.00	1.644	6	21.69	15.13	0.9193
ATMAA1412D-1A20	120.0000	0.17	4.25	2.45	180.00	1.624	6	8.66	4.04	0.9193
DB846F65ZAXY w/ Mount Pipe	0.0000	0.35	0.00	-8.91	177.00	1.616	6	16.77	19.53	0.9175
BXA-185063/12CFx2 w/ Mount Pipe	0.0000	0.13	0.00	-8.91	177.00	1.616	6	6.02	7.21	0.9175
BXA-70040/6CFx4 w/ Mount Pipe	0.0000	0.25	0.00	-8.91	177.00	1.616	6	17.85	9.27	0.9175
FD9R6004/2C-3L	0.0000	0.02	0.00	-8.91	177.00	1.616	6	1.06	0.37	0.9175
BXA-70040/6CFx4 w/ Mount Pipe	120.0000	0.25	7.72	4.46	177.00	1.616	6	17.85	9.27	0.9175
LPA-80063/6CFx5 w/ Mount Pipe	120.0000	0.46	7.72	4.46	177.00	1.616	6	23.47	25.45	0.9175
APX18-206516L-CT0 w/ Mount Pipe	120.0000	0.11	7.72	4.46	177.00	1.616	6	4.52	4.55	0.9175
FD9R6004/2C-3L	120.0000	0.02	7.72	4.46	177.00	1.616	6	1.06	0.37	0.9175
BXA-70040/6CFx4 w/ Mount Pipe	240.0000	0.25	-7.72	4.46	177.00	1.616	6	17.85	9.27	0.9175
APX18-206516L-CT0 w/ Mount Pipe	240.0000	0.11	-7.72	4.46	177.00	1.616	6	4.52	4.55	0.9175
FD9R6004/2C-3L	240.0000	0.02	-7.72	4.46	177.00	1.616	6	1.06	0.37	0.9175
SC-E 6014 rev2 w/ Mount Pipe	240.0000	0.22	-7.72	4.46	177.00	1.616	6	9.05	11.07	0.9175
Sector Mount [SM 502-3]	0.0000	2.68	0.00	0.00	177.00	1.616	6	59.33	59.33	0.9175
LLPX310R w/ Mount Pipe	0.0000	0.12	0.00	-8.92	168.00	1.592	6	5.83	3.99	0.9118
FDD_R6_RRH	0.0000	0.06	0.00	-8.92	168.00	1.592	6	2.13	1.04	0.9118
LLPX310R w/ Mount Pipe	120.0000	0.12	7.73	4.46	168.00	1.592	6	5.83	3.99	0.9118
FDD_R6_RRH	120.0000	0.06	7.73	4.46	168.00	1.592	6	2.13	1.04	0.9118
LLPX310R w/ Mount Pipe	240.0000	0.12	-7.73	4.46	168.00	1.592	6	5.83	3.99	0.9118
FDD_R6_RRH	240.0000	0.06	-7.73	4.46	168.00	1.592	6	2.13	1.04	0.9118
Sector Mount [SM 411-3]	0.0000	1.83	0.00	0.00	168.00	1.592	6	37.93	37.93	0.9118
DUAL BAND 800/1900 FULL BAND MASTHEAD 7770.00 w/ Mount Pipe	0.0000	0.15	0.00	-9.05	160.00	1.570	6	7.03	5.58	0.9051
LGP13519	0.0000	0.02	0.00	-9.05	160.00	1.570	6	0.99	0.69	0.9051
DTMABP7819VG12A	0.0000	0.03	0.00	-9.05	160.00	1.570	6	1.41	0.57	0.9051
RRUS-11	0.0000	0.18	0.00	-9.05	160.00	1.570	6	6.73	3.11	0.9051
AM-X-CD-16-65-00T-RET w/ Mount Pipe	0.0000	0.40	0.00	-9.05	160.00	1.570	6	19.30	16.40	0.9051
7020.00	0.0000	0.01	0.00	-9.05	160.00	1.570	6	0.22	0.35	0.9051

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
DC6-48-60-18-8F	0.0000	0.08	0.00	-9.05	160.00	1.570	6	2.99	4.83	0.9051
DUAL BAND 800/1900 FULL BAND MASTHEAD	120.0000	0.10	7.84	4.53	160.00	1.570	6	3.72	2.12	0.9051
7770.00 w/ Mount Pipe	120.0000	0.15	7.84	4.53	160.00	1.570	6	7.03	5.58	0.9051
LGP13519	120.0000	0.02	7.84	4.53	160.00	1.570	6	0.99	0.69	0.9051
SBNH-1D6565C w/ Mount Pipe	120.0000	0.54	7.84	4.53	160.00	1.570	6	25.99	25.24	0.9051
DTMABP7819VG12A	120.0000	0.03	7.84	4.53	160.00	1.570	6	1.41	0.57	0.9051
RRUS-11	120.0000	0.18	7.84	4.53	160.00	1.570	6	6.73	3.11	0.9051
7020.00	120.0000	0.01	7.84	4.53	160.00	1.570	6	0.22	0.35	0.9051
DTMABP7819VG12A	240.0000	0.03	-7.84	4.53	160.00	1.570	6	1.41	0.57	0.9051
RRUS-11	240.0000	0.18	-7.84	4.53	160.00	1.570	6	6.73	3.11	0.9051
AM-X-CD-16-65-00T-RET w/ Mount Pipe	240.0000	0.40	-7.84	4.53	160.00	1.570	6	19.30	16.40	0.9051
7020.00	240.0000	0.01	-7.84	4.53	160.00	1.570	6	0.22	0.35	0.9051
7770.00 w/ Mount Pipe	240.0000	0.15	-7.84	4.53	160.00	1.570	6	7.03	5.58	0.9051
LGP13519	240.0000	0.02	-7.84	4.53	160.00	1.570	6	0.99	0.69	0.9051
DUAL BAND 800/1900 FULL BAND MASTHEAD	240.0000	0.10	-7.84	4.53	160.00	1.570	6	3.72	2.12	0.9051
Sector Mount [SM 502-3]	0.0000	2.67	0.00	0.00	158.00	1.564	6	58.98	58.98	0.9051
Empty Mount Pipe	0.0000	0.05	0.00	-9.05	160.00	1.570	6	2.58	2.58	0.9051
Empty Mount Pipe	120.0000	0.05	7.84	4.53	160.00	1.570	6	2.58	2.58	0.9051
Empty Mount Pipe	240.0000	0.05	-7.84	4.53	160.00	1.570	6	2.58	2.58	0.9051
APXV18-206517S-C w/ Mount Pipe	0.0000	0.14	0.00	-6.15	148.00	1.535	6	6.37	6.56	0.8980
APXV18-206517S-C w/ Mount Pipe	120.0000	0.14	5.33	3.08	148.00	1.535	6	6.37	6.56	0.8980
APXV18-206517S-C w/ Mount Pipe	240.0000	0.14	-5.33	3.08	148.00	1.535	6	6.37	6.56	0.8980
Pipe Mount [PM 602-1]	0.0000	0.13	0.00	-11.35	70.00	1.240	4	7.30	2.19	0.8208
GPS_A	0.0000	0.01	0.00	-14.01	40.00	1.057	4	0.42	0.42	0.7675
Side Arm Mount [SO 201-1]	0.0000	0.13	0.00	-13.01	40.00	1.057	4	4.71	3.37	0.7675
	Sum Weight:	14.40								

Discrete Appurtenance Pressures - Service $G_H = 1.121$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Lightning Rod	0.0000	0.03	0.00	0.00	181.50	1.628	10	0.25	0.25
8'x2 1/2" Pipe Mount	120.0000	0.04	4.25	2.45	184.00	1.634	10	2.30	2.30
AIR 21	120.0000	0.24	4.25	2.45	188.00	1.644	11	19.25	12.83
ATMAA1412D-1A20	120.0000	0.06	4.25	2.45	180.00	1.624	10	7.00	2.80
DB846F65ZAXY w/ Mount Pipe	0.0000	0.10	0.00	-8.91	177.00	1.616	10	14.54	15.64
BXA-185063/12CFx2 w/ Mount Pipe	0.0000	0.04	0.00	-8.91	177.00	1.616	10	5.03	5.29
BXA-70040/6CFx4 w/ Mount Pipe	0.0000	0.06	0.00	-8.91	177.00	1.616	10	16.55	7.37
FD9R6004/2C-3L	0.0000	0.01	0.00	-8.91	177.00	1.616	10	0.73	0.17
BXA-70040/6CFx4 w/ Mount Pipe	120.0000	0.06	7.72	4.46	177.00	1.616	10	16.55	7.37
LPA-80063/6CFx5 w/	120.0000	0.10	7.72	4.46	177.00	1.616	10	21.09	21.29

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Mount Pipe									
APX18-206516L-CT0 w/ Mount Pipe	120.0000	0.04	7.72	4.46	177.00	1.616	10	3.74	3.29
FD9R6004/2C-3L	120.0000	0.01	7.72	4.46	177.00	1.616	10	0.73	0.17
BXA-70040/6CFx4 w/ Mount Pipe	240.0000	0.06	-7.72	4.46	177.00	1.616	10	16.55	7.37
APX18-206516L-CT0 w/ Mount Pipe	240.0000	0.04	-7.72	4.46	177.00	1.616	10	3.74	3.29
FD9R6004/2C-3L	240.0000	0.01	-7.72	4.46	177.00	1.616	10	0.73	0.17
SC-E 6014 rev2 w/ Mount Pipe	240.0000	0.06	-7.72	4.46	177.00	1.616	10	7.57	8.79
Sector Mount [SM 502-3]	0.0000	1.67	0.00	0.00	177.00	1.616	10	33.02	33.02
LLPX310R w/ Mount Pipe	0.0000	0.05	0.00	-8.92	168.00	1.592	10	5.07	2.98
FDD_R6_RRH	0.0000	0.03	0.00	-8.92	168.00	1.592	10	1.79	0.78
LLPX310R w/ Mount Pipe	120.0000	0.05	7.73	4.46	168.00	1.592	10	5.07	2.98
FDD_R6_RRH	120.0000	0.03	7.73	4.46	168.00	1.592	10	1.79	0.78
LLPX310R w/ Mount Pipe	240.0000	0.05	-7.73	4.46	168.00	1.592	10	5.07	2.98
FDD_R6_RRH	240.0000	0.03	-7.73	4.46	168.00	1.592	10	1.79	0.78
Sector Mount [SM 411-3]	0.0000	1.07	0.00	0.00	168.00	1.592	10	21.88	21.88
DUAL BAND 800/1900 FULL BAND MASTHEAD	0.0000	0.06	0.00	-9.05	160.00	1.570	10	3.10	1.62
7770.00 w/ Mount Pipe	0.0000	0.06	0.00	-9.05	160.00	1.570	10	6.12	4.25
LGP13519	0.0000	0.01	0.00	-9.05	160.00	1.570	10	0.68	0.41
DTMABP7819VG12A	0.0000	0.02	0.00	-9.05	160.00	1.570	10	1.14	0.39
RRUS-11	0.0000	0.12	0.00	-9.05	160.00	1.570	10	5.88	2.49
AM-X-CD-16-65-00T-RET w/ Mount Pipe	0.0000	0.14	0.00	-9.05	160.00	1.570	10	17.00	12.61
7020.00	0.0000	0.00	0.00	-9.05	160.00	1.570	10	0.12	0.20
DC6-48-60-18-8F	0.0000	0.02	0.00	-9.05	160.00	1.570	10	2.57	4.32
DUAL BAND 800/1900 FULL BAND MASTHEAD	120.0000	0.06	7.84	4.53	160.00	1.570	10	3.10	1.62
7770.00 w/ Mount Pipe	120.0000	0.06	7.84	4.53	160.00	1.570	10	6.12	4.25
LGP13519	120.0000	0.01	7.84	4.53	160.00	1.570	10	0.68	0.41
SBNH-1D6565C w/ Mount Pipe	120.0000	0.20	7.84	4.53	160.00	1.570	10	23.37	19.68
DTMABP7819VG12A	120.0000	0.02	7.84	4.53	160.00	1.570	10	1.14	0.39
RRUS-11	120.0000	0.12	7.84	4.53	160.00	1.570	10	5.88	2.49
7020.00	120.0000	0.00	7.84	4.53	160.00	1.570	10	0.12	0.20
DTMABP7819VG12A	240.0000	0.02	-7.84	4.53	160.00	1.570	10	1.14	0.39
RRUS-11	240.0000	0.12	-7.84	4.53	160.00	1.570	10	5.88	2.49
AM-X-CD-16-65-00T-RET w/ Mount Pipe	240.0000	0.14	-7.84	4.53	160.00	1.570	10	17.00	12.61
7020.00	240.0000	0.00	-7.84	4.53	160.00	1.570	10	0.12	0.20
7770.00 w/ Mount Pipe	240.0000	0.06	-7.84	4.53	160.00	1.570	10	6.12	4.25
LGP13519	240.0000	0.01	-7.84	4.53	160.00	1.570	10	0.68	0.41
DUAL BAND 800/1900 FULL BAND MASTHEAD	240.0000	0.06	-7.84	4.53	160.00	1.570	10	3.10	1.62
Sector Mount [SM 502-3]	0.0000	1.67	0.00	0.00	158.00	1.564	10	33.02	33.02
Empty Mount Pipe	0.0000	0.03	0.00	-9.05	160.00	1.570	10	1.40	1.40
Empty Mount Pipe	120.0000	0.03	7.84	4.53	160.00	1.570	10	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-7.84	4.53	160.00	1.570	10	1.40	1.40
APXV18-206517S-C w/	0.0000	0.05	0.00	-6.15	148.00	1.535	10	5.40	4.70

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Mount Pipe APXV18-206517S-C w/ Mount Pipe	120.0000	0.05	5.33	3.08	148.00	1.535	10	5.40	4.70
APXV18-206517S-C w/ Mount Pipe	240.0000	0.05	-5.33	3.08	148.00	1.535	10	5.40	4.70
Pipe Mount [PM 602-1]	0.0000	0.09	0.00	-11.35	70.00	1.240	8	5.25	1.58
GPS_A	0.0000	0.00	0.00	-14.01	40.00	1.057	7	0.30	0.30
Side Arm Mount [SO 201-1]	0.0000	0.10	0.00	-13.01	40.00	1.057	7	2.96	2.11
	Sum Weight:	7.35							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
168.00	A-ANT-18G-2-C	330.0000	0.03	-6.86	3.96	1.592	3.72	29
70.00	HP10-59E	0.0000	0.32	0.00	-11.85	1.240	78.54	23
		Sum Weight:	0.35					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf	t_z in
168.00	A-ANT-18G-2-C	330.0000	0.07	-6.86	3.96	1.592	4.25	6	0.9118
70.00	HP10-59E	0.0000	0.99	0.00	-11.85	1.240	80.70	4	0.8208
		Sum Weight:	1.06						

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
168.00	A-ANT-18G-2-C	330.0000	0.03	-6.86	3.96	1.592	3.72	10
70.00	HP10-59E	0.0000	0.32	0.00	-11.85	1.240	78.54	8
		Sum Weight:	0.35					

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	11.17					
Bracing Weight	14.70					

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Member Self-Weight	25.88			28.37	-12.44	
Total Weight	48.00			28.37	-12.44	
Wind 0 deg - No Ice		-0.17	-44.69	-4777.25	18.43	46.86
Wind 30 deg - No Ice		21.37	-38.40	-4091.98	-2336.73	46.19
Wind 60 deg - No Ice		37.31	-22.30	-2345.26	-4075.30	30.39
Wind 90 deg - No Ice		43.65	0.10	69.73	-4765.80	7.35
Wind 120 deg - No Ice		37.88	23.48	2538.03	-4151.19	-11.02
Wind 150 deg - No Ice		21.84	39.16	4229.28	-2409.28	-32.52
Wind 180 deg - No Ice		0.26	44.68	4824.66	-58.89	-45.43
Wind 210 deg - No Ice		-21.39	39.02	4203.65	2304.01	-45.99
Wind 240 deg - No Ice		-37.67	23.06	2461.54	4087.24	-35.08
Wind 270 deg - No Ice		-43.60	-0.40	-20.40	4732.48	-6.13
Wind 300 deg - No Ice		-37.53	-22.62	-2403.02	4089.23	15.78
Wind 330 deg - No Ice		-21.69	-38.59	-4127.80	2371.01	33.90
Member Ice	14.32					
Total Weight Ice	99.33			85.50	-74.70	
Wind 0 deg - Ice		-0.03	-12.97	-1329.22	-69.47	14.53
Wind 30 deg - Ice		6.27	-11.14	-1128.62	-765.10	15.03
Wind 60 deg - Ice		10.90	-6.45	-614.30	-1275.91	10.99
Wind 90 deg - Ice		12.71	0.02	93.43	-1475.17	4.26
Wind 120 deg - Ice		11.06	6.71	813.92	-1294.62	-2.33
Wind 150 deg - Ice		6.35	11.29	1315.16	-778.25	-9.51
Wind 180 deg - Ice		0.05	12.91	1493.68	-83.43	-14.14
Wind 210 deg - Ice		-6.27	11.27	1311.10	613.75	-14.96
Wind 240 deg - Ice		-11.02	6.63	799.70	1138.14	-12.03
Wind 270 deg - Ice		-12.70	-0.08	76.61	1323.87	-3.99
Wind 300 deg - Ice		-10.94	-6.51	-624.33	1133.52	3.31
Wind 330 deg - Ice		-6.32	-11.17	-1134.97	626.04	9.80
Total Weight	48.00			28.37	-12.44	
Wind 0 deg - Service		-0.06	-15.46	-1668.09	8.66	16.22
Wind 30 deg - Service		7.39	-13.29	-1430.97	-806.27	15.98
Wind 60 deg - Service		12.91	-7.72	-826.57	-1407.85	10.51
Wind 90 deg - Service		15.10	0.03	9.07	-1646.78	2.54
Wind 120 deg - Service		13.11	8.13	863.15	-1434.11	-3.81
Wind 150 deg - Service		7.56	13.55	1448.36	-831.37	-11.25
Wind 180 deg - Service		0.09	15.46	1654.37	-18.09	-15.72
Wind 210 deg - Service		-7.40	13.50	1439.49	799.52	-15.91
Wind 240 deg - Service		-13.03	7.98	836.69	1416.56	-12.14
Wind 270 deg - Service		-15.09	-0.14	-22.12	1639.82	-2.12
Wind 300 deg - Service		-12.99	-7.83	-846.55	1417.24	5.46
Wind 330 deg - Service		-7.50	-13.35	-1443.37	822.70	11.73

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice

Comb. No.	Description
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 160	Leg	Max Tension	12	7.70	0.12	0.06
			Max. Compression	6	-12.12	0.45	0.03
			Max. Mx	12	-0.45	1.93	-0.08
			Max. My	9	-1.20	0.01	-2.18
			Max. Vy	6	0.99	0.00	0.00
			Max. Vx	9	1.17	0.00	0.00
		Diagonal	Max Tension	5	5.71	0.00	0.00
			Max. Compression	5	-5.77	0.00	0.00
			Max. Mx	20	1.57	0.03	0.00
			Max. My	8	-0.48	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	13	3.08	0.00	0.00
			Max. Compression	5	-3.10	0.00	0.00
			Max. Mx	21	0.09	-0.02	-0.00
			Max. My	12	-0.64	-0.01	-0.01
			Max. Vy	21	-0.02	-0.02	-0.00
			Max. Vx	12	0.00	-0.01	-0.01
		Top Girt	Max Tension	8	1.33	-0.01	0.00
			Max. Compression	2	-1.32	-0.01	-0.00
			Max. Mx	17	-0.18	-0.02	-0.00
			Max. My	6	0.49	-0.01	0.00
			Max. Vy	17	-0.02	-0.02	-0.00
			Max. Vx	6	-0.00	-0.01	0.00
		Inner Bracing	Max Tension	2	0.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-0.02	0.00	0.00
			Max. Mx	14	-0.00	-0.01	0.00
			Max. My	19	0.00	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	12	33.26	-0.01	0.01
			Max. Compression	6	-42.37	0.12	0.00
			Max. Mx	12	14.67	1.52	-0.02
			Max. My	3	-3.71	-0.03	1.62
			Max. Vy	12	-1.01	-0.49	-0.03
			Max. Vx	9	1.11	-0.03	0.57
		Diagonal	Max Tension	13	8.01	0.00	0.00
			Max. Compression	13	-8.08	0.00	0.00
			Max. Mx	20	2.14	0.04	0.00
			Max. My	8	-0.96	0.00	0.00
			Max. Vy	20	0.02	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	13	4.87	0.00	0.00
			Max. Compression	13	-4.88	-0.01	0.00
			Max. Mx	21	0.23	-0.03	-0.00
			Max. My	6	-0.01	-0.00	0.01
			Max. Vy	21	-0.02	-0.03	-0.00
			Max. Vx	6	-0.00	-0.00	0.01
		Inner Bracing	Max Tension	3	0.00	0.00	0.00
			Max. Compression	13	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.02	0.00
			Max. My	19	-0.00	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	12	59.80	-0.14	0.00
			Max. Compression	6	-71.74	0.32	0.01
			Max. Mx	12	59.64	-0.33	-0.00
			Max. My	9	-6.35	-0.01	0.39
			Max. Vy	12	0.07	-0.33	-0.00
			Max. Vx	3	0.11	-0.01	-0.38
		Diagonal	Max Tension	13	7.67	0.00	0.00
			Max. Compression	13	-7.76	0.00	0.00
			Max. Mx	20	2.10	0.05	0.00
			Max. My	8	-1.03	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	13	5.22	0.00	0.00
			Max. Compression	13	-5.23	-0.02	0.00
			Max. Mx	21	0.35	-0.04	-0.00
			Max. My	12	-0.66	-0.03	-0.01
			Max. Vy	21	-0.03	-0.04	-0.00
			Max. Vx	12	0.00	-0.03	-0.01
		Inner Bracing	Max Tension	3	0.00	0.00	0.00
			Max. Compression	8	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.03	0.00
			Max. My	19	-0.00	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	12	79.17	-0.35	-0.00
			Max. Compression	6	-93.88	0.40	0.01
			Max. Mx	12	78.87	-0.42	-0.01
			Max. My	9	-7.78	-0.01	0.45
			Max. Vy	12	0.08	-0.42	-0.01
			Max. Vx	9	-0.12	-0.01	0.43
		Diagonal	Max Tension	13	9.23	0.00	0.00
			Max. Compression	13	-9.37	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	2.55	0.11	0.00
			Max. My	8	-1.34	0.00	0.00
			Max. Vy	20	-0.04	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Horizontal	Max Tension	13	5.48	0.00	0.00
			Max. Compression	13	-5.53	-0.02	-0.00
			Max. Mx	21	0.45	-0.06	-0.00
			Max. My	12	-0.86	-0.04	-0.01
			Max. Vy	21	-0.03	-0.06	-0.00
			Max. Vx	12	0.00	-0.04	-0.01
		Inner Bracing	Max Tension	3	0.00	0.00	0.00
			Max. Compression	13	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.03	0.00
			Max. My	19	-0.00	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	12	99.36	-0.35	0.01
			Max. Compression	6	-117.40	0.41	0.04
			Max. Mx	12	99.06	-0.44	-0.03
			Max. My	9	-9.37	-0.01	0.54
			Max. Vy	12	0.08	-0.44	-0.03
			Max. Vx	9	-0.13	-0.01	0.54
		Diagonal	Max Tension	13	8.36	0.00	0.00
			Max. Compression	13	-8.54	0.00	0.00
			Max. Mx	20	2.23	0.14	0.00
			Max. My	8	-1.35	0.00	0.00
			Max. Vy	20	-0.04	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	13	5.50	0.00	0.00
			Max. Compression	13	-5.55	-0.03	-0.00
			Max. Mx	21	0.56	-0.07	-0.00
			Max. My	2	1.45	-0.01	0.01
			Max. Vy	21	-0.04	-0.07	-0.00
			Max. Vx	6	-0.00	-0.01	0.01
		Inner Bracing	Max Tension	3	0.00	0.00	0.00
			Max. Compression	25	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.06	0.00
			Max. My	6	-0.00	0.00	-0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	12	117.29	-0.49	0.11
			Max. Compression	6	-138.96	0.50	0.06
			Max. Mx	12	117.02	-0.53	-0.05
			Max. My	9	-11.06	-0.01	0.65
			Max. Vy	8	-0.99	-0.45	0.05
			Max. Vx	5	1.00	-0.02	0.32
		Diagonal	Max Tension	7	9.89	0.00	0.00
			Max. Compression	7	-10.16	0.00	0.00
			Max. Mx	20	2.57	0.17	0.00
			Max. My	8	-1.36	0.00	0.00
			Max. Vy	20	-0.05	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	7	7.22	-0.07	0.00
			Max. Compression	13	-7.13	-0.07	-0.00
			Max. Mx	21	0.67	-0.13	-0.00
			Max. My	8	-1.65	-0.10	-0.02
			Max. Vy	21	-0.06	-0.13	-0.00
			Max. Vx	8	0.00	-0.10	-0.02
		Inner Bracing	Max Tension	3	0.00	0.00	0.00
			Max. Compression	7	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.09	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	6	-0.00	0.00	-0.00
			Max. Vy	14	0.04	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	8	137.16	-0.49	0.05
			Max. Compression	6	-162.23	0.39	0.01
			Max. Mx	12	127.02	-0.53	-0.05
			Max. My	9	-12.11	-0.01	0.65
			Max. Vy	12	-0.09	-0.51	0.01
			Max. Vx	9	0.12	-0.01	0.65
		Diagonal	Max Tension	7	9.88	0.00	0.00
			Max. Compression	7	-10.24	0.00	0.00
			Max. Mx	20	2.48	0.24	0.00
			Max. My	8	-1.39	0.00	0.00
			Max. Vy	20	-0.06	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	7	7.51	-0.09	0.00
			Max. Compression	7	-7.44	-0.09	0.00
			Max. Mx	21	0.78	-0.15	-0.00
			Max. My	8	-1.52	-0.10	-0.01
			Max. Vy	21	-0.06	-0.15	-0.00
			Max. Vx	8	0.00	-0.10	-0.01
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.16	0.00
			Max. My	6	-0.00	0.00	-0.00
			Max. Vy	14	-0.06	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	8	155.61	-0.80	0.02
			Max. Compression	6	-184.18	-1.40	0.08
			Max. Mx	6	-184.18	-1.40	0.08
			Max. My	9	-16.84	-0.30	1.97
			Max. Vy	2	0.28	0.91	-0.01
			Max. Vx	9	-0.27	-0.30	1.97
		Diagonal	Max Tension	7	9.46	0.00	0.00
			Max. Compression	7	-9.91	0.00	0.00
			Max. Mx	20	2.29	0.29	0.00
			Max. My	8	-1.42	0.00	0.00
			Max. Vy	20	-0.07	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Horizontal	Max Tension	7	7.62	-0.11	0.00
			Max. Compression	7	-7.48	-0.11	0.00
			Max. Mx	21	0.90	-0.18	-0.00
			Max. My	8	-1.73	-0.12	-0.01
			Max. Vy	21	-0.07	-0.18	-0.00
			Max. Vx	8	0.00	-0.12	-0.01
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.19	0.00
			Max. My	6	-0.00	0.00	-0.00
			Max. Vy	14	-0.06	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T9	20 - 0	Leg	Max Tension	8	162.72	0.74	0.18
			Max. Compression	6	-194.39	-0.00	-0.00
			Max. Mx	6	-194.00	5.35	-0.13
			Max. My	9	-17.97	-0.29	1.97
			Max. Vy	6	-0.74	5.35	-0.13
			Max. Vx	9	0.45	-0.29	1.97
		Diagonal	Max Tension	7	14.65	-0.15	-0.04
			Max. Compression	7	-15.12	0.00	0.00
			Max. Mx	8	10.24	-0.18	0.06
			Max. My	7	-14.69	0.02	-0.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	21	0.05	-0.13	0.01
			Max. Vx	7	-0.01	0.00	0.00
		Horizontal	Max Tension	7	8.17	-0.16	0.00
			Max. Compression	7	-8.26	-0.16	0.00
			Max. Mx	21	-1.07	-0.24	-0.01
			Max. My	2	1.53	-0.09	0.02
			Max. Vy	21	0.09	-0.24	-0.01
			Max. Vx	2	-0.00	-0.09	0.02
		Redund Horz 1 Bracing	Max Tension	6	3.37	0.00	0.00
			Max. Compression	6	-3.37	0.00	0.00
			Max. Mx	26	1.25	0.02	0.00
			Max. Vy	26	-0.01	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	6	3.08	0.00	0.00
			Max. Compression	6	-3.08	0.00	0.00
			Max. Mx	19	1.40	0.04	0.00
			Max. My	2	3.02	0.00	-0.00
			Max. Vy	19	0.01	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	13	-0.04	0.00	0.00
			Max. Mx	14	-0.01	0.02	0.00
			Max. Vy	14	-0.01	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	13	0.08	0.00	0.00
			Max. Compression	10	-0.05	0.00	0.00
			Max. Mx	21	0.04	0.19	0.00
			Max. My	10	0.03	0.00	0.00
			Max. Vy	21	-0.05	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-0.01	0.00	0.00
			Max. Mx	14	-0.01	0.23	0.00
			Max. My	6	-0.00	0.00	0.00
			Max. Vy	14	-0.07	0.00	0.00
			Max. Vx	6	-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	10	210.43	23.19	-12.70
	Max. H_x	10	210.43	23.19	-12.70
	Max. H_z	4	-175.66	-20.63	11.29
	Min. Vert	4	-175.66	-20.63	11.29
	Min. H_x	4	-175.66	-20.63	11.29
	Min. H_z	10	210.43	23.19	-12.70
Leg B	Max. Vert	6	214.35	-22.94	-13.66
	Max. H_x	12	-177.37	20.32	12.24
	Max. H_z	13	-151.86	16.21	12.79
	Min. Vert	12	-177.37	20.32	12.24
	Min. H_x	6	214.35	-22.94	-13.66
	Min. H_z	7	187.36	-18.72	-14.10
Leg A	Max. Vert	2	210.71	0.97	26.71

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	11	16.85	4.07	1.58
	Max. H_z	2	210.71	0.97	26.71
	Min. Vert	8	-180.79	-0.97	-24.21
	Min. H_x	5	13.08	-4.03	1.26
	Min. H_z	8	-180.79	-0.97	-24.21

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	48.00	-0.00	-0.00	28.36	-12.42	-0.00
Dead+Wind 0 deg - No Ice	48.00	-0.17	-44.69	-4667.15	18.40	46.90
Dead+Wind 30 deg - No Ice	48.00	21.37	-38.40	-3997.87	-2282.49	46.28
Dead+Wind 60 deg - No Ice	48.00	37.31	-22.30	-2291.08	-3981.82	30.51
Dead+Wind 90 deg - No Ice	48.00	43.65	0.10	70.00	-4657.44	7.46
Dead+Wind 120 deg - No Ice	48.00	37.88	23.48	2483.34	-4056.03	-10.95
Dead+Wind 150 deg - No Ice	48.00	21.84	39.16	4135.55	-2355.23	-32.52
Dead+Wind 180 deg - No Ice	48.00	0.26	44.68	4716.86	-59.14	-45.48
Dead+Wind 210 deg - No Ice	48.00	-21.39	39.02	4109.90	2249.52	-46.08
Dead+Wind 240 deg - No Ice	48.00	-37.67	23.06	2406.64	3991.85	-35.20
Dead+Wind 270 deg - No Ice	48.00	-43.60	-0.40	-20.45	4624.01	-6.23
Dead+Wind 300 deg - No Ice	48.00	-37.53	-22.62	-2349.11	3995.75	15.72
Dead+Wind 330 deg - No Ice	48.00	-21.69	-38.59	-4033.88	2316.77	33.88
Dead+Ice+Temp	99.33	-0.00	-0.00	85.87	-75.00	-0.00
Dead+Wind 0 deg+Ice+Temp	99.33	-0.03	-12.97	-1297.95	-69.92	14.61
Dead+Wind 30 deg+Ice+Temp	99.33	6.27	-11.14	-1101.85	-750.41	15.14
Dead+Wind 60 deg+Ice+Temp	99.33	10.90	-6.45	-598.67	-1250.29	11.12
Dead+Wind 90 deg+Ice+Temp	99.33	12.71	0.02	94.05	-1445.40	4.36
Dead+Wind 120 deg+Ice+Temp	99.33	11.06	6.71	799.22	-1268.52	-2.29
Dead+Wind 150 deg+Ice+Temp	99.33	6.35	11.29	1289.56	-763.61	-9.53
Dead+Wind 180 deg+Ice+Temp	99.33	0.05	12.91	1464.16	-83.93	-14.21
Dead+Wind 210 deg+Ice+Temp	99.33	-6.27	11.27	1285.48	598.12	-15.08
Dead+Wind 240 deg+Ice+Temp	99.33	-11.02	6.63	784.89	1111.05	-12.15
Dead+Wind 270 deg+Ice+Temp	99.33	-12.70	-0.08	77.11	1293.17	-4.09
Dead+Wind 300 deg+Ice+Temp	99.33	-10.94	-6.51	-608.78	1107.00	3.26
Dead+Wind 330 deg+Ice+Temp	99.33	-6.32	-11.17	-1108.25	610.46	9.82
Dead+Wind 0 deg - Service	48.00	-0.06	-15.46	-1596.34	-1.78	16.23
Dead+Wind 30 deg - Service	48.00	7.39	-13.29	-1364.77	-797.92	16.02
Dead+Wind 60 deg - Service	48.00	12.91	-7.72	-774.14	-1385.95	10.55
Dead+Wind 90 deg - Service	48.00	15.10	0.03	42.82	-1619.74	2.58
Dead+Wind 120 deg - Service	48.00	13.11	8.13	877.90	-1411.64	-3.79
Dead+Wind 150 deg - Service	48.00	7.56	13.55	1449.61	-823.12	-11.25
Dead+Wind 180 deg - Service	48.00	0.09	15.46	1650.73	-28.64	-15.74
Dead+Wind 210 deg - Service	48.00	-7.40	13.50	1440.71	770.26	-15.95
Dead+Wind 240 deg - Service	48.00	-13.03	7.98	851.35	1373.13	-12.18
Dead+Wind 270 deg - Service	48.00	-15.09	-0.14	11.53	1591.86	-2.16
Dead+Wind 300 deg - Service	48.00	-12.99	-7.83	-794.24	1374.45	5.44
Dead+Wind 330 deg - Service	48.00	-7.50	-13.35	-1377.20	793.51	11.73

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-48.00	0.00	0.00	48.00	0.00	0.000%
2	-0.17	-48.00	-44.69	0.17	48.00	44.69	0.001%
3	21.37	-48.00	-38.40	-21.37	48.00	38.40	0.001%
4	37.31	-48.00	-22.30	-37.31	48.00	22.30	0.001%
5	43.65	-48.00	0.10	-43.65	48.00	-0.10	0.001%
6	37.88	-48.00	23.48	-37.88	48.00	-23.48	0.001%
7	21.84	-48.00	39.16	-21.84	48.00	-39.16	0.001%
8	0.26	-48.00	44.68	-0.26	48.00	-44.68	0.001%
9	-21.39	-48.00	39.02	21.39	48.00	-39.02	0.001%
10	-37.67	-48.00	23.06	37.67	48.00	-23.06	0.001%
11	-43.60	-48.00	-0.40	43.60	48.00	0.40	0.001%
12	-37.53	-48.00	-22.62	37.53	48.00	22.62	0.001%
13	-21.69	-48.00	-38.59	21.69	48.00	38.59	0.001%
14	0.00	-99.33	0.00	0.00	99.33	0.00	0.000%
15	-0.03	-99.33	-12.97	0.03	99.33	12.97	0.000%
16	6.27	-99.33	-11.14	-6.27	99.33	11.14	0.000%
17	10.90	-99.33	-6.45	-10.90	99.33	6.45	0.000%
18	12.71	-99.33	0.02	-12.71	99.33	-0.02	0.000%
19	11.06	-99.33	6.71	-11.06	99.33	-6.71	0.000%
20	6.35	-99.33	11.29	-6.35	99.33	-11.29	0.000%
21	0.05	-99.33	12.91	-0.05	99.33	-12.91	0.000%
22	-6.27	-99.33	11.27	6.27	99.33	-11.27	0.000%
23	-11.02	-99.33	6.63	11.02	99.33	-6.63	0.000%
24	-12.70	-99.33	-0.08	12.70	99.33	0.08	0.000%
25	-10.94	-99.33	-6.51	10.94	99.33	6.51	0.000%
26	-6.32	-99.33	-11.17	6.32	99.33	11.17	0.000%
27	-0.06	-48.00	-15.46	0.06	48.00	15.46	0.000%
28	7.39	-48.00	-13.29	-7.39	48.00	13.29	0.000%
29	12.91	-48.00	-7.72	-12.91	48.00	7.72	0.000%
30	15.10	-48.00	0.03	-15.10	48.00	-0.03	0.000%
31	13.11	-48.00	8.13	-13.11	48.00	-8.13	0.000%
32	7.56	-48.00	13.55	-7.56	48.00	-13.55	0.000%
33	0.09	-48.00	15.46	-0.09	48.00	-15.46	0.000%
34	-7.40	-48.00	13.50	7.40	48.00	-13.50	0.000%
35	-13.03	-48.00	7.98	13.03	48.00	-7.98	0.000%
36	-15.09	-48.00	-0.14	15.09	48.00	0.14	0.000%
37	-12.99	-48.00	-7.83	12.99	48.00	7.83	0.000%
38	-7.50	-48.00	-13.35	7.50	48.00	13.35	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00000001	0.00008485
3	Yes	8	0.00000001	0.00008168
4	Yes	8	0.00000001	0.00007833
5	Yes	8	0.00000001	0.00008207
6	Yes	8	0.00000001	0.00008528
7	Yes	8	0.00000001	0.00008176
8	Yes	8	0.00000001	0.00007801
9	Yes	8	0.00000001	0.00008131
10	Yes	8	0.00000001	0.00008512
11	Yes	8	0.00000001	0.00008185
12	Yes	8	0.00000001	0.00007811
13	Yes	8	0.00000001	0.00008137

14	Yes	7	0.00000001	0.00007330
15	Yes	8	0.00000001	0.00014000
16	Yes	8	0.00000001	0.00014179
17	Yes	8	0.00000001	0.00014450
18	Yes	8	0.00000001	0.00014858
19	Yes	9	0.00000001	0.00003217
20	Yes	8	0.00000001	0.00014987
21	Yes	8	0.00000001	0.00014756
22	Yes	8	0.00000001	0.00014616
23	Yes	8	0.00000001	0.00014455
24	Yes	8	0.00000001	0.00014047
25	Yes	8	0.00000001	0.00013700
26	Yes	8	0.00000001	0.00013730
27	Yes	8	0.00000001	0.00007894
28	Yes	8	0.00000001	0.00007798
29	Yes	8	0.00000001	0.00007717
30	Yes	8	0.00000001	0.00007862
31	Yes	8	0.00000001	0.00007974
32	Yes	8	0.00000001	0.00007840
33	Yes	8	0.00000001	0.00007710
34	Yes	8	0.00000001	0.00007809
35	Yes	8	0.00000001	0.00007941
36	Yes	8	0.00000001	0.00007830
37	Yes	8	0.00000001	0.00007695
38	Yes	8	0.00000001	0.00007781

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	3.673	31	0.1835	0.0717
T2	160 - 140	2.896	31	0.1744	0.0603
T3	140 - 120	2.172	31	0.1523	0.0448
T4	120 - 100	1.556	31	0.1266	0.0325
T5	100 - 80	1.058	31	0.1039	0.0237
T6	80 - 60	0.667	32	0.0788	0.0167
T7	60 - 40	0.375	32	0.0554	0.0114
T8	40 - 20	0.169	32	0.0362	0.0074
T9	20 - 0	0.044	27	0.0167	0.0037

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
181.50	Lightning Rod	31	3.673	0.1835	0.0717	384655
180.00	8'x2 1/2" Pipe Mount	31	3.673	0.1835	0.0717	384655
177.00	(2) DB846F65ZAXY w/ Mount Pipe	31	3.556	0.1826	0.0702	384655
168.00	A-ANT-18G-2-C	31	3.204	0.1792	0.0654	160273
158.00	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	31	2.820	0.1727	0.0589	84267
148.00	APXV18-206517S-C w/ Mount Pipe	31	2.451	0.1623	0.0510	52644
70.00	HP10-59E	32	0.509	0.0665	0.0138	50566
40.00	GPS_A	32	0.169	0.0362	0.0074	65463

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	10.481	6	0.5184	0.2073
T2	160 - 140	8.276	6	0.4950	0.1744
T3	140 - 120	6.214	6	0.4334	0.1295
T4	120 - 100	4.455	6	0.3608	0.0939
T5	100 - 80	3.033	6	0.2963	0.0686
T6	80 - 60	1.911	7	0.2250	0.0483
T7	60 - 40	1.075	7	0.1583	0.0330
T8	40 - 20	0.486	7	0.1034	0.0215
T9	20 - 0	0.125	2	0.0476	0.0108

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
181.50	Lightning Rod	6	10.481	0.5184	0.2073	149922
180.00	8'x2 1/2" Pipe Mount	6	10.481	0.5184	0.2073	149922
177.00	(2) DB846F65ZAXY w/ Mount Pipe	6	10.147	0.5163	0.2029	149922
168.00	A-ANT-18G-2-C	6	9.150	0.5079	0.1890	62467
158.00	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	6	8.061	0.4905	0.1703	32073
148.00	APXV18-206517S-C w/ Mount Pipe	6	7.010	0.4616	0.1476	18953
70.00	HP10-59E	7	1.460	0.1901	0.0400	17703
40.00	GPS_A	7	0.486	0.1034	0.0215	22977

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	180	Leg	A325N	0.7500	4	1.92	19.44	0.099 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	1.92	6.44	0.299 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.55	6.44	0.240 ✔	1.333	Bolt Shear
T2	160	Leg	A325N	0.8750	4	8.31	26.46	0.314 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.69	6.44	0.418 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.44	6.44	0.378 ✔	1.333	Bolt Shear
T3	140	Leg	A325N	1.0000	4	14.95	34.56	0.433 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.59	6.44	0.402 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.62	6.44	0.406 ✔	1.333	Bolt Shear
T4	120	Leg	A325N	1.0000	4	19.79	34.56	0.573 ✔	1.333	Bolt Tension

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
		Diagonal	A325N	0.6250	3	3.12	6.44	0.485 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.77	6.44	0.429 ✔	1.333	Bolt Shear
T5	100	Leg	A325N	1.0000	6	16.56	34.56	0.479 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.85	6.44	0.442 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.77	6.44	0.431 ✔	1.333	Bolt Shear
T6	80	Leg	A325N	1.0000	6	19.56	34.56	0.566 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.39	6.44	0.526 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.61	6.44	0.560 ✔	1.333	Bolt Shear
T7	60	Leg	A325N	1.0000	6	22.86	34.56	0.662 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.41	6.44	0.530 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.75	6.44	0.583 ✔	1.333	Bolt Shear
T8	40	Leg	A325N	1.0000	8	19.45	34.56	0.563 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.30	6.44	0.513 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.81	6.44	0.592 ✔	1.333	Bolt Shear
T9	20	Leg	A449	1.0000	8	20.30	31.10	0.653 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.04	6.44	0.782 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.13	6.44	0.641 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 160	ROHN 2.5 STD	20.00	6.67	84.4 K=1.00	18.110	1.7040	-12.12	30.86	0.393 ✔
T2	160 - 140	ROHN 3 X-STR	20.04	6.68	70.5 K=1.00	20.840	3.0159	-42.37	62.85	0.674 ✔
T3	140 - 120	ROHN 4 X-STR	20.04	6.68	54.3 K=1.00	23.671	4.4074	-71.74	104.33	0.688 ✔
T4	120 - 100	ROHN 5 X-STR	20.04	10.02	65.4 K=1.00	21.776	6.1120	-93.88	133.10	0.705 ✔
T5	100 - 80	ROHN 5 X-STR	20.06	10.03	65.4 K=1.00	21.769	6.1120	-117.40	133.05	0.882 ✔
T6	80 - 60	ROHN 6 EHS	20.05	10.03	54.1 K=1.00	23.705	6.7133	-138.96	159.14	0.873 ✔
T7	60 - 40	ROHN 6 X-STR	20.05	10.03	54.8 K=1.00	23.583	8.4049	-162.23	198.21	0.818 ✔
T8	40 - 20	ROHN 6 X-STR	20.06	10.03	54.8 K=1.00	23.580	8.4049	-184.18	198.19	0.929 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 8 EHS	20.05	10.03	41.2 K=1.00	25.662	9.7193	-194.38	249.41	0.779 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD	7.92	7.70	117.3 K=1.00	10.850	1.0745	-5.77	11.66	0.495 ✔
T2	160 - 140	ROHN 2 STD	8.53	8.29	126.4 K=1.00	9.342	1.0745	-7.88	10.04	0.785 ✔
T3	140 - 120	ROHN 2 STD	9.21	8.94	136.3 K=1.00	8.039	1.0745	-7.64	8.64	0.885 ✔
T4	120 - 100	ROHN 2.5 STD	12.49	12.10	153.3 K=1.00	6.353	1.7040	-9.30	10.82	0.859 ✔
T5	100 - 80	ROHN 2.5 STD	13.31	12.96	164.1 K=1.00	5.546	1.7040	-8.51	9.45	0.900 ✔
T6	80 - 60	ROHN 2.5 STD	14.16	13.77	174.4 K=1.00	4.908	1.7040	-10.16	8.36	1.215 ✔
T7	60 - 40	ROHN 2.5 X-STR	15.07	14.70	190.9 K=1.00	4.096	2.2535	-10.23	9.23	1.108 ✔
T8	40 - 20	ROHN 3 STD	16.08	15.73	162.2 K=1.00	5.675	2.2285	-9.91	12.65	0.784 ✔
T9	20 - 0	ROHN 3 STD	24.33	12.17	125.5 K=1.00	9.486	2.2285	-15.12	21.14	0.715 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.53	4.14	79.9 K=1.00	19.038	0.7995	-3.10	15.22	0.204 ✔
T2	160 - 140	ROHN 1.5 STD	9.93	4.82	92.9 K=1.00	16.310	0.7995	-4.88	13.04	0.374 ✔
T3	140 - 120	ROHN 2 STD	12.01	5.82	88.7 K=1.00	17.212	1.0745	-5.23	18.50	0.283 ✔
T4	120 - 100	ROHN 2 STD	13.83	6.68	101.9 K=1.00	14.260	1.0745	-5.53	15.32	0.361 ✔
T5	100 - 80	ROHN 2 STD	16.25	7.89	120.3 K=1.00	10.313	1.0745	-5.55	11.08	0.501 ✔
T6	80 - 60	ROHN 2.5 STD	18.79	9.12	115.5 K=1.00	11.192	1.7040	-7.13	19.07	0.374 ✔
T7	60 - 40	ROHN 2.5 STD	21.29	10.37	131.3 K=1.00	8.656	1.7040	-7.44	14.75	0.504 ✔
T8	40 - 20	ROHN 2.5 STD	23.86	11.65	147.6	6.854	1.7040	-7.48	11.68	0.640

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.00					✔
T9	20 - 0	ROHN 3 STD	25.18	12.31	127.0 K=1.00	9.262	2.2285	-8.26	20.64	0.400 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.50	4.13	79.6 K=1.00	19.091	0.7995	-1.32	15.26	0.087 ✔

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	5.93	145.4 K=1.00	7.062	0.5202	-3.37	3.67	0.918 ✔

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 1.5 STD	11.50	10.94	210.9 K=1.00	3.357	0.7995	-3.08	2.68	1.148 ✔

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	6.29	154.2 K=1.00	6.278	0.5202	-0.04	3.27	0.013 ✔

Redundant Hip Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 2.5 STD	15.07	15.07	190.9 K=1.00	4.096	1.7040	-0.05	6.98	0.007* ✔

* DL controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	4.25	4.25	128.3 K=1.00	9.074	0.4844	-0.02	4.39	0.005 ✔
T2	160 - 140	L2x2x1/8	4.62	4.62	139.4 K=1.00	7.685	0.4844	-0.01	3.72	0.002 ✔
T3	140 - 120	L2x2x1/8	6.01	6.01	181.3 K=1.00	4.542	0.4844	-0.01	2.20	0.003 ✔
T4	120 - 100	L2x2x1/8	6.92	6.92	208.8 K=1.00	3.426	0.4844	-0.01	1.66	0.004 ✔
T5	100 - 80	L2 1/2x2 1/2x3/16	8.13	8.13	197.0 K=1.00	3.849	0.9020	-0.01	3.47	0.002* ✔
T6	80 - 60	L3x3x3/16	9.40	9.40	189.2 K=1.00	4.173	1.0900	-0.01	4.55	0.002* ✔
T7	60 - 40	L3 1/2x3 1/2x1/4	10.65	10.65	184.1 K=1.00	4.407	1.6900	-0.01	7.45	0.001* ✔
T8	40 - 20	L3 1/2x3 1/2x1/4	11.93	11.93	206.3 K=1.00	3.510	1.6900	-0.01	5.93	0.002* ✔
T9	20 - 0	ROHN 3 STD	12.59	12.59	129.8 K=1.00	8.860	2.2285	-0.01	19.74	0.001* ✔

* DL controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2.5 STD	20.00	6.67	84.4	30.000	1.7040	7.70	51.12	0.151 ✔
T2	160 - 140	ROHN 3 X-STR	20.04	6.68	70.5	30.000	3.0159	33.26	90.48	0.368 ✔
T3	140 - 120	ROHN 4 X-STR	20.04	6.68	54.3	30.000	4.4074	59.80	132.22	0.452 ✔
T4	120 - 100	ROHN 5 X-STR	20.04	10.02	65.4	30.000	6.1120	79.17	183.36	0.432

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	100 - 80	ROHN 5 X-STR	20.06	10.03	65.4	30.000	6.1120	99.36	183.36	0.542 ✔
T6	80 - 60	ROHN 6 EHS	20.05	10.03	54.1	30.000	6.7133	117.34	201.40	0.583 ✔
T7	60 - 40	ROHN 6 X-STR	20.05	10.03	54.8	30.000	8.4049	137.16	252.15	0.544 ✔
T8	40 - 20	ROHN 6 X-STR	20.06	10.03	54.8	30.000	8.4049	155.61	252.15	0.617 ✔
T9	20 - 0	ROHN 8 EHS	20.05	10.03	41.2	30.000	9.7193	162.72	291.58	0.558 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD	7.92	7.70	117.3	30.000	1.0745	5.71	32.24	0.177 ✔
T2	160 - 140	ROHN 2 STD	8.31	8.08	123.2	30.000	1.0745	8.01	32.24	0.249 ✔
T3	140 - 120	ROHN 2 STD	8.75	8.48	129.2	30.000	1.0745	7.67	32.24	0.238 ✔
T4	120 - 100	ROHN 2.5 STD	12.16	11.78	149.2	30.000	1.7040	9.23	51.12	0.181 ✔
T5	100 - 80	ROHN 2.5 STD	12.89	12.54	158.8	30.000	1.7040	8.36	51.12	0.164 ✔
T6	80 - 60	ROHN 2.5 STD	14.16	13.77	174.4	30.000	1.7040	9.89	51.12	0.193 ✔
T7	60 - 40	ROHN 2.5 X-STR	14.61	14.24	184.9	30.000	2.2535	9.88	67.61	0.146 ✔
T8	40 - 20	ROHN 3 STD	15.57	15.22	157.0	30.000	2.2285	9.46	66.85	0.142 ✔
T9	20 - 0	ROHN 3 STD	24.33	12.17	125.5	30.000	2.2285	14.65	66.85	0.219 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.53	4.14	79.9	30.000	0.7995	3.08	23.98	0.129 ✔
T2	160 - 140	ROHN 1.5 STD	9.93	4.82	92.9	30.000	0.7995	4.87	23.98	0.203 ✔
T3	140 - 120	ROHN 2 STD	12.01	5.82	88.7	30.000	1.0745	5.22	32.24	0.162 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	120 - 100	ROHN 2 STD	13.83	6.68	101.9	30.000	1.0745	5.48	32.24	0.170 ✔
T5	100 - 80	ROHN 2 STD	16.25	7.89	120.3	30.000	1.0745	5.50	32.24	0.171 ✔
T6	80 - 60	ROHN 2.5 STD	18.79	9.12	115.5	30.000	1.7040	7.22	51.12	0.141 ✔
T7	60 - 40	ROHN 2.5 STD	21.29	10.37	131.3	30.000	1.7040	7.51	51.12	0.147 ✔
T8	40 - 20	ROHN 2.5 STD	23.86	11.65	147.6	30.000	1.7040	7.62	51.12	0.149 ✔
T9	20 - 0	ROHN 3 STD	25.18	12.31	127.0	30.000	2.2285	8.17	66.85	0.122 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.50	4.13	79.6	30.000	0.7995	1.33	23.98	0.055 ✔

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	5.93	145.4	30.000	0.5202	3.37	15.61	0.216 ✔

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 1.5 STD	11.50	10.94	210.9	30.000	0.7995	3.08	23.98	0.129 ✔

Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 2.5 STD	15.07	15.07	190.9	30.000	1.7040	0.08	51.12	0.001 ✔

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	4.25	4.25	81.4	21.600	0.4844	0.02	10.46	0.002 ✔
T2	160 - 140	L2x2x1/8	4.27	4.27	81.8	21.600	0.4844	0.00	10.46	0.000 ✔
T3	140 - 120	L2x2x1/8	5.31	5.31	101.8	21.600	0.4844	0.00	10.46	0.000 ✔
T4	120 - 100	L2x2x1/8	6.35	6.35	121.8	21.600	0.4844	0.00	10.46	0.000 ✔
T5	100 - 80	L2 1/2x2 1/2x3/16	7.48	7.48	115.4	21.600	0.9020	0.00	19.48	0.000 ✔
T6	80 - 60	L3x3x3/16	8.77	8.77	112.1	21.600	1.0900	0.00	23.54	0.000 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 STD	2	-12.12	41.14	29.5	Pass
T2	160 - 140	Leg	ROHN 3 X-STR	41	-42.37	83.78	50.6	Pass
T3	140 - 120	Leg	ROHN 4 X-STR	80	-71.74	139.07	51.6	Pass
T4	120 - 100	Leg	ROHN 5 X-STR	119	-93.88	177.42	52.9	Pass
T5	100 - 80	Leg	ROHN 5 X-STR	146	-117.40	177.35	66.2	Pass
T6	80 - 60	Leg	ROHN 6 EHS	173	-138.96	212.13	65.5	Pass
T7	60 - 40	Leg	ROHN 6 X-STR	200	-162.23	264.22	61.4	Pass
T8	40 - 20	Leg	ROHN 6 X-STR	227	-184.18	264.19	69.7	Pass
T9	20 - 0	Leg	ROHN 8 EHS	254	-194.38	332.47	58.5	Pass
T1	180 - 160	Diagonal	ROHN 2 STD	9	-5.77	15.54	37.1	Pass
T2	160 - 140	Diagonal	ROHN 2 STD	48	-7.88	13.38	58.9	Pass
T3	140 - 120	Diagonal	ROHN 2 STD	87	-7.64	11.51	66.4	Pass
T4	120 - 100	Diagonal	ROHN 2.5 STD	126	-9.30	14.43	64.5	Pass
T5	100 - 80	Diagonal	ROHN 2.5 STD	153	-8.51	12.60	67.5	Pass
T6	80 - 60	Diagonal	ROHN 2.5 STD	179	-10.16	11.15	91.1	Pass
T7	60 - 40	Diagonal	ROHN 2.5 X-STR	206	-10.23	12.30	83.1	Pass
T8	40 - 20	Diagonal	ROHN 3 STD	233	-9.91	16.86	58.8	Pass
T9	20 - 0	Diagonal	ROHN 3 STD	264	-15.12	28.18	53.7 58.7 (b)	Pass
T1	180 - 160	Horizontal	ROHN 1.5 STD	7	-3.10	20.29	15.3 18.0 (b)	Pass
T2	160 - 140	Horizontal	ROHN 1.5 STD	46	-4.88	17.38	28.1 28.4 (b)	Pass
T3	140 - 120	Horizontal	ROHN 2 STD	85	-5.23	24.65	21.2 30.5 (b)	Pass

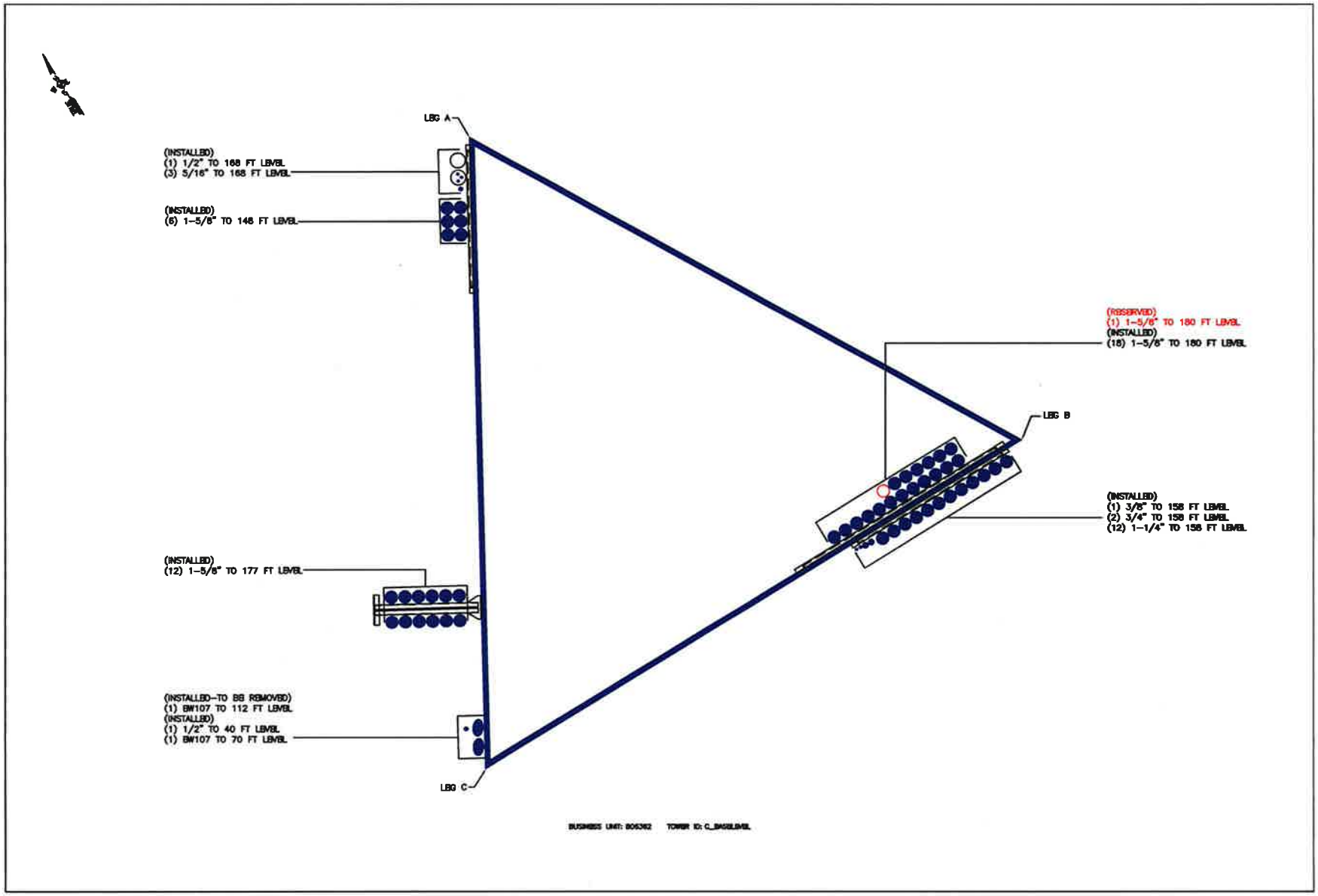
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T4	120 - 100	Horizontal	ROHN 2 STD	124	-5.53	20.43	27.1 32.2 (b)	Pass
T5	100 - 80	Horizontal	ROHN 2 STD	151	-5.55	14.77	37.6	Pass
T6	80 - 60	Horizontal	ROHN 2.5 STD	178	-7.13	25.42	28.0 42.0 (b)	Pass
T7	60 - 40	Horizontal	ROHN 2.5 STD	205	-7.44	19.66	37.8 43.7 (b)	Pass
T8	40 - 20	Horizontal	ROHN 2.5 STD	232	-7.48	15.57	48.0	Pass
T9	20 - 0	Horizontal	ROHN 3 STD	263	-8.26	27.51	30.0 48.1 (b)	Pass
T1	180 - 160	Top Girt	ROHN 1.5 STD	5	-1.32	20.34	6.5	Pass
T9	20 - 0	Redund Horz 1 Bracing	ROHN TS1.5x11 ga	265	-3.37	4.90	68.9	Pass
T9	20 - 0	Redund Diag 1 Bracing	ROHN 1.5 STD	262	-3.08	3.58	86.1	Pass
T9	20 - 0	Redund Hip 1 Bracing	ROHN TS1.5x11 ga	270	-0.04	4.35	1.0	Pass
T9	20 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	282	-0.05	6.98	0.7	Pass
T1	180 - 160	Inner Bracing	L2x2x1/8	37	-0.02	5.86	0.4	Pass
T2	160 - 140	Inner Bracing	L2x2x1/8	52	-0.01	4.29	0.3	Pass
T3	140 - 120	Inner Bracing	L2x2x1/8	91	-0.01	2.93	0.4	Pass
T4	120 - 100	Inner Bracing	L2x2x1/8	131	-0.01	2.21	0.4	Pass
T5	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	157	-0.01	3.47	0.4	Pass
T6	80 - 60	Inner Bracing	L3x3x3/16	184	-0.01	4.55	0.5	Pass
T7	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	212	-0.01	7.45	0.5	Pass
T8	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.01	5.93	0.5	Pass
T9	20 - 0	Inner Bracing	ROHN 3 STD	284	-0.01	19.74	0.4	Pass
							Summary	
						Leg (T8)	69.7	Pass
						Diagonal (T6)	91.1	Pass
						Horizontal (T9)	48.1	Pass
						Top Girt (T1)	6.5	Pass
						Redund Horz 1 Bracing (T9)	68.9	Pass
						Redund Diag 1 Bracing (T9)	86.1	Pass
						Redund Hip 1 Bracing (T9)	1.0	Pass
						Redund Hip Diagonal Bracing (T9)	0.7	Pass
						Inner Bracing (T8)	0.5	Pass
						Bolt Checks	58.7	Pass
						RATING =	**91.1**	**Pass**

Element Map

Section No.	Section Elevation ft	Component Type	Element List
T1	180.00-160.00	Leg	1-3
		Diagonal	8-9,11-12,14-15,20-21,23-24,26-27,31-36
		Horizontal	7,10,13,19,22,25
		Top Girt	4-6
		Inner Bracing	16-18,28-30,37-39
T2	160.00-140.00	Leg	40-42
		Diagonal	44-45,47-48,50-51,56-57,59-60,62-63,68-69,71-72,74-75
		Horizontal	43,46,49,55,58,61,67,70,73
		Inner Bracing	52-54,64-66,76-78
T3	140.00-120.00	Leg	79-81
		Diagonal	83-84,86-87,89-90,95-96,98-99,101-102,107-108,110-111,113-114
		Horizontal	82,85,88,94,97,100,106,109,112
		Inner Bracing	91-93,103-105,115-117
T4	120.00-100.00	Leg	118-120
		Diagonal	122-123,125-126,128-129,134-135,137-138,140-141
		Horizontal	121,124,127,133,136,139
		Inner Bracing	130-132,142-144
T5	100.00-80.00	Leg	145-147
		Diagonal	149-150,152-153,155-156,161-162,164-165,167-168
		Horizontal	148,151,154,160,163,166
		Inner Bracing	157-159,169-171
T6	80.00-60.00	Leg	172-174
		Diagonal	176-177,179-180,182-183,188-189,191-192,194-195
		Horizontal	175,178,181,187,190,193
		Inner Bracing	184-186,196-198
T7	60.00-40.00	Leg	199-201
		Diagonal	203-204,206-207,209-210,215-216,218-219,221-222
		Horizontal	202,205,208,214,217,220
		Inner Bracing	211-213,223-225
T8	40.00-20.00	Leg	226-228
		Diagonal	230-231,233-234,236-237,242-243,245-246,248-249
		Horizontal	229,232,235,241,244,247
		Inner Bracing	238-240,250-252
T9	20.00-0.00	Leg	253-255
		Diagonal	257,260,264,267,273,276
		Horizontal	256,263,272
		Redund Horz 1 Bracing	258,261,265,268,274,277
		Redund Diag 1 Bracing	259,262,266,269,275,278
		Redund Hip 1 Bracing	270,279,281
		Redund Hip Diagonal Bracing	271,280,282
		Inner Bracing	283-285
			Total number of elements: 285

APPENDIX B

BASE LEVEL DRAWING

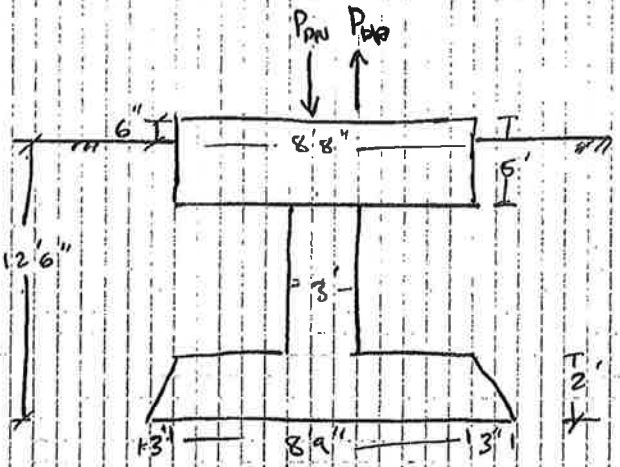

LEG A
(INSTALLED)
(1) 1/2" TO 168 FT LEVEL
(3) 5/16" TO 168 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 148 FT LEVEL
(RESERVED)
(1) 1-5/8" TO 180 FT LEVEL
(INSTALLED)
(18) 1-5/8" TO 180 FT LEVEL
LEG B
(INSTALLED)
(1) 3/8" TO 158 FT LEVEL
(2) 3/4" TO 158 FT LEVEL
(12) 1-1/4" TO 158 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 177 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) BW107 TO 112 FT LEVEL
(INSTALLED)
(1) 1/2" TO 40 FT LEVEL
(1) BW107 TO 70 FT LEVEL
LEG C
BUSINESS UNIT: 805362
TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

FDH

Project: BU 806362
Sheet ____ of ____ Date: ____
By: ____ FDH Project #: ____
Checked By: ____ Drawing #: ____



FROM TNX:

P_{UP} = 181 K

P_{DN} = 214 K

$W_C = (V_{MOD} + V_{PIER} + V_{PAD})\,\gamma_C$

$W_C = \left[(9^2 \times 2) + (8^2 \times 6) + (8.67^2 \times 5)\right](.150)$

W_C = 88.78 K

W_S = 0.135 KCF $\left[\left[(9.25\ FT)^2\right](3\ FT)^2\right](10.5' - 6')$

+ 0.12 KCF $\left[\left\{(9.25\ FT)^2 - (3\ FT)^2\right\}(6 - 4.5')\right]$

+ 0.12 KCF $\left[\left\{(9.25\ FT)^2 - (8.75\ FT)^2\right\}4.5\right]$ = 46.51 K + 13.78 K + 4.86 K

W_S = 65.15 K

COMPRESSION (ALLOWABLE BEARING CAPACITY = 8000 PSF) - FDH GEO

$P_{BEARING\ RESIST\ ULT} = (8\ KSF)(3)(0.75)(9.25)^2 = 1540.125$ K

$P_{DN-TOT} = P_{DN} + W_C + W_S$ = 214 K + 88.78 K + 65.15 K = 367.93 K

CAPACITY = $\frac{367.93\ K}{1540.125\ K}$ = 23.9 %

FDH

Project: BU 806362
Sheet _____ of _____
By: _____
Checked By: _____
Date: _____
FDH Project #: _____
Drawing #: _____

UPLIFT

UPLIFT RESISTANCE DUE TO COHESION (7 KSF FROM 6'-10.5')

$= (4)(9.25')(10.5' - 6')(7\ KSF) = 1165.5\ K$

$U_{RESISTANCE} = \text{MIN}$

$\frac{88.78\ K}{1.25} + \frac{65.15\ K}{2.0} + \frac{1165.5\ K}{2.0} = 686.35\ K$

$\frac{88.78\ K + 65.15\ K + 1165.5\ K}{1.5} = 879.62\ K$

$\text{CAPACITY} = \frac{181\ K}{686.35\ K} = \boxed{26.4\ \%}$

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