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April 7, 2015

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

Regarding:	Notice of Exempt Modification – Addition of 3 radio heads previously approved
Property Address:	50 Rockland Rd, Norwalk CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 184 foot self supporting ("tower") location on the Property. AT&T's facility consists of nine (9) wireless telecommunications antennas at 102 feet. The tower is controlled by Crown Castle. The Council approved the previous application on June 1, 2012 reference number EM-CING-103-110330. This application (attached) granted AT&T the use of 6 radio heads at this location. The approval expired one year from the issue date. During that time AT&T made the changes to the site per the approval but only installed three (3) of the six (6) radio heads that they received approval. AT&T would now like to install the additional three (3) radio heads that were originally approved under EM-CING-103-110330

Please accept this application 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 the Mayor, and the Town Planner for the City of Norwalk . A copy of this letter is also being sent to Crown Castle, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's additional, previously approved 3 radio heads will be installed at 102 foot level of the 184 foot Monopole
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and 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) safety

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

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standard. An RF emissions calculation (attached) for AT&T's modified facility was provided in the application which led to the April 21, 2011 Decision.

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 AT&T's proposed modifications. (Please see attached Structural analysis completed by FDH January 29, 2014).

For the foregoing reasons AT&T respectfully requests that the proposed addition of 3 radio heads previously approved be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

David P. Cooper
Director of Site Acquisition
Empire Telecom

CC: Harry W. Rilling, Mayor, for City of Norwalk CT
Michael B. Greene, Director, Planning & Zoning, Norwalk CT
Crown Castle
Crown Atlantic Company LLC – underlying property owner

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

CT2122
Crown
184' SS
102" RAD

Date: **January 29, 2014**

Steve Tuttle
Crown Castle
8 Parkmeadow Drive
Pittsford, NY 14534

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Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate Carrier Site Name:**	
Crown Castle Designation:	**Crown Castle BU Number:**	807133
	Crown Castle Site Name:	BRG 134 943057
	Crown Castle JDE Job Number:	246471
	Crown Castle Work Order Number:	704277
	Crown Castle Application Number:	200736 Rev. 3
Engineering Firm Designation:	**FDH Engineering, Inc. Project Number:**	1421YV1400
Site Data:	**50 ROCKLAND ROADNORWALK OFC - MTSO, SO NORWALK, Fairfield County, CT** **Latitude *41° 4' 54.44"*, Longitude *-73° 25' 49.52"*** **180 Foot - Self Support Tower**	

Dear Steve Tuttle,

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 611955, in accordance with application 200736, revision 3.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing 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:

Jeffrey B. Ray, EI
Project Engineer

Reviewed by:

Dennis D. Abel PE
Director - Structural Engineering
CT PE License No. 23247

STATE OF CONNECTICUT
DENNIS D. ABEL
No. 23247
LICENSED PROFESSIONAL ENGINEER

01-29-2014

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 July of 1987. The tower was originally designed for E.I.A Zone A. The tower has been modified multiple times in the past to accommodate additional loading.

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
126.0	128.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	-
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	rymsa wireless	MG D3-800Tx 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
178.0	178.0	2	crown mounts	Side Arm Mount [SO 306-1]	-	-	1
172.0	173.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	172.0	1	crown mounts	Sector Mount [SM 602-3]			
157.0	157.0	2	andrew	VHLP2-18	2	1/2	1
		1	crown mounts	Side Arm Mount [SO 311-3]			
143.0	145.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		3	alcatel lucent	800MHZ 2X50W RRH			
	142.0	9	rfs celwave	ACU-A20-N			
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		3	alcatel lucent	800 MHz RRH			
	143.0	1	crown mounts	Side Arm Mount [SO 312-3]			
134.0	135.0	1	andrew	VHLP2-23	9 6 1	1-1/4 5/16 1/2	1
		3	argus technologies	LLPX310R w/ Mount Pipe			
		9	decibel	DB844H90-XY w/ Mount Pipe			
		3	samsung telecommunications	FDD_R6_RRH			
	134.0	1	crown mounts	Pipe Mount [PM 601-1]			
		1	crown mounts	Sector Mount [SM 502-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
126.0	130.0	1	gps	GPS_A	18 1	1-5/8 1/2	1
	128.0	2	andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	powerwave technologies	P65.16.XL.2 w/ Mount Pipe			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		1	crown mounts	Sector Mount [SM 411-3]			
		4	decibel	DB844G65ZAXY w/ Mount Pipe			
		2	decibel	DB844H80-XY w/ Mount Pipe			
112.0	112.0	1	crown mounts	Sector Mount [SM 104-3]	6	1-5/8	1
		3	kathrein	800 10504 w/ Mount Pipe			
102.0	102.0	1	crown mounts	Sector Mount [SM 301-3]	12 2 1	1-5/8 5/8 3/8	1
		6	ericsson	RRUS-11			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
		6	powerwave technologies	LGP2140X			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
30.0	30.0	2	crown mounts	Side Arm Mount [SO 701-1]	2	1/2	1
		2	gps	GPS_A			
12.0	12.0	1	astron wireless	VG-1060	2	1/4	1
		1	crown mounts	Pipe Mount [PM 601-1]			
		1	gps	GPS_A			

Notes:
1) Existing 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)
217	217	4	celwave	PD10017	-	-
207	207	6	celwave	PD1132	-	-
180	180	3	generic	8' Dish	-	-
170	170	1	generic	8' Dish	-	-
156	156	1	generic	8' Dish	-	-
150	150	1	generic	8' Dish	-	-
130	130	1	celwave	PD1109	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2311843	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Arcnet/ Paul J. Ford	821566	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	392878	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Inc.	1257479	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 3 EH	3	-8.01	96.06	8.3	Pass
T2	160 - 153.333	Leg	ROHN 4 EH	34	-11.85	139.07	8.5	Pass
T3	153.333 - 146.667	Leg	ROHN 4 EH	43	-16.86	139.07	12.1	Pass
T4	146.667 - 140	Leg	ROHN 4 EH	55	-22.95	139.07	16.5	Pass
T5	140 - 120	Leg	ROHN 5 EH	67	-49.59	206.29	24.0	Pass
T6	120 - 100	Leg	ROHN 6 EHS	88	-84.25	236.06	35.7	Pass
T7	100 - 80	Leg	ROHN 6 EH	109	-118.64	264.29	44.9	Pass
T8	80 - 70	Leg	ROHN 8 EHS	124	-136.76	332.54	41.1	Pass
T9	70 - 60	Leg	ROHN 8 EHS	133	-155.28	332.54	46.7	Pass
T10	60 - 40	Leg	ROHN 8 EHS	142	-191.70	332.54	57.6	Pass
T11	40 - 20	Leg	ROHN 8 EH	157	-227.66	435.22	52.3	Pass
T12	20 - 0	Leg	ROHN 8 EH	172	-263.43	435.22	60.5	Pass
T1	180 - 160	Diagonal	L2x2x3/16	15	-1.69	6.68	25.3 28.4 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	160 - 153.333	Diagonal	L2 1/2x2 1/2x1/4	42	-2.27	13.09	17.3 24.2 (b)	Pass
T3	153.333 - 146.667	Diagonal	L2 1/2x2 1/2x1/4	54	-2.60	11.83	21.9 27.4 (b)	Pass
T4	146.667 - 140	Diagonal	L2 1/2x2 1/2x1/4	66	-3.15	10.74	29.3 34.1 (b)	Pass
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	75	-6.31	8.26	76.4	Pass
T6	120 - 100	Diagonal	L3x3x1/4	95	-7.81	11.62	67.2 76.6 (b)	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	113	-9.79	12.51	78.3 80.5 (b)	Pass
T8	80 - 70	Diagonal	L3 1/2x3 1/2x1/4	128	-10.37	11.68	88.8	Pass
T9	70 - 60	Diagonal	2L3 1/2x3 1/2x1/4x3/8	137	-11.19	17.97	62.3 63.8 (b)	Pass
T10	60 - 40	Diagonal	L4x4x1/4	146	-11.77	13.64	86.3 93.9 (b)	Pass
T11	40 - 20	Diagonal	L4x4x5/16	161	-12.45	14.28	87.2	Pass
T12	20 - 0	Diagonal	2L4x4x5/16x3/8	176	-13.59	20.68	65.7 77.5 (b)	Pass
T1	180 - 160	Top Girt	L2x2x1/8	6	-0.08	2.79	2.8	Pass
T3	153.333 - 146.667	Top Girt	L2x2x1/8	46	-0.16	1.36	11.7	Pass
T4	146.667 - 140	Top Girt	L2x2x1/8	59	-0.14	1.17	12.4	Pass
T1	180 - 160	Mid Girt	L2x2x1/8	7	-0.18	2.05	9.0	Pass
							Summary	
						Leg (T12)	60.5	Pass
						Diagonal (T10)	93.9	Pass
						Top Girt (T4)	12.4	Pass
						Mid Girt (T1)	9.0	Pass
						Bolt Checks	93.9	Pass
						RATING =	**93.9**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	51.9	Pass
1	Base Foundation	0	98.9	Pass

Structure Rating (max from all components) =	98.9%

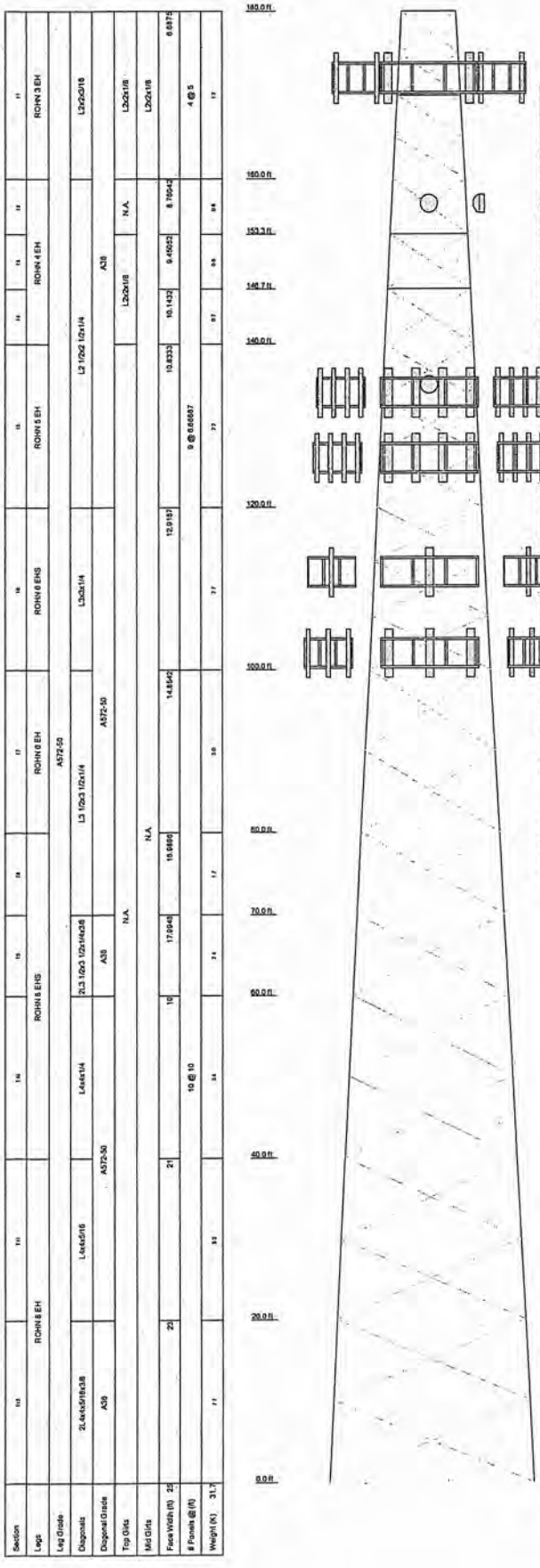
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Empty Pipe Mount	178	MG D3-800TV w/ Mount Pipe	126
Empty Pipe Mount	178	MG D3-800TV w/ Mount Pipe	126
Side Arm Mount [SO 306-1]	178	MG D3-800TV w/ Mount Pipe	126
Side Arm Mount [SO 306-1]	178	P65.16.XL_2 w/ Mount Pipe	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	172	GPS_A	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	172	RRHQX40-AWS	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	172	RRHQX40-AWS	126
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	172	RRHQX40-AWS	126
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	172	MG D3-800Tx w/ Mount Pipe	126
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	172	MG D3-800Tx w/ Mount Pipe	126
KRY 112 144/1	172	MG D3-800Tx w/ Mount Pipe	126
KRY 112 144/1	172	DB-T1-6Z-8AB-0Z	126
KRY 112 144/1	172	Sector Mount [SM 411-3]	126
(2) Empty Mount Pipe	172	LNX-6514DS-T4M w/ Mount Pipe	126
(2) Empty Mount Pipe	172	LNX-6514DS-T4M w/ Mount Pipe	126
(2) Empty Mount Pipe	172	(2) DB844G65ZAXY w/ Mount Pipe	126
Sector Mount [SM 802-3]	172	Empty Mount Pipe	112
Side Arm Mount [SO 311-3]	157	Empty Mount Pipe	112
VHLP2-18	157	Empty Mount Pipe	112
VHLP2-18	157	Sector Mount [SM 104-3]	112
800 MHz RRH	143	800 10504 w/ Mount Pipe	112
800MHZ 2X50W RRH	143	800 10504 w/ Mount Pipe	112
800MHZ 2X50W RRH	143	800 10504 w/ Mount Pipe	112
800MHZ 2X50W RRH	143	(2) LGP13519	102
PCS 1900MHz 4x45W-65MHz	143	(2) LGP13519	102
PCS 1900MHz 4x45W-65MHz	143	(2) LGP13519	102
PCS 1900MHz 4x45W-65MHz	143	(2) LGP2140X	102
(3) ACU-A20-N	143	(2) LGP2140X	102
(3) ACU-A20-N	143	(2) LGP2140X	102
(3) ACU-A20-N	143	(2) RRUS-11	102
APXVSPP18-C-A20 w/ Mount Pipe	143	(2) RRUS-11	102
APXVSPP18-C-A20 w/ Mount Pipe	143	(2) RRUS-11	102
APXVSPP18-C-A20 w/ Mount Pipe	143	P65-18-XLH-RR w/ Mount Pipe	102
Side Arm Mount [SO 312-3]	143	P65-18-XLH-RR w/ Mount Pipe	102
800 MHz RRH	143	P65-18-XLH-RR w/ Mount Pipe	102
800 MHz RRH	143	DC6-48-60-18-8F	102
LLPX310R w/ Mount Pipe	134	Empty Mount Pipe	102
(3) DB844H90-XY w/ Mount Pipe	134	Empty Mount Pipe	102
(3) DB844H90-XY w/ Mount Pipe	134	Empty Mount Pipe	102
(3) DB844H90-XY w/ Mount Pipe	134	Sector Mount [SM 301-3]	102
FDD_R6_RRH	134	(2) 7770.00 w/ Mount Pipe	102
FDD_R6_RRH	134	(2) 7770.00 w/ Mount Pipe	102
FDD_R6_RRH	134	(2) 7770.00 w/ Mount Pipe	102
Pipe Mount [PM 601-1]	134	Side Arm Mount [SO 701-1]	30
Sector Mount [SM 502-3]	134	GPS_A	30
LLPX310R w/ Mount Pipe	134	GPS_A	30
LLPX310R w/ Mount Pipe	134	Side Arm Mount [SO 701-1]	30
VHLP2-23	134	VG-1060	12
(2) DB844H80-XY w/ Mount Pipe	128	GPS_A	12
(2) DB844G65ZAXY w/ Mount Pipe	128	Pipe Mount [PM 601-1]	12

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 93.9%

MAX. CORNER REACTIONS AT BASE:
DOWN: 272 K
SHEAR: 35 K

UPLIFT: -222 K
SHEAR: 29 K

AXIAL
116 K
SHEAR 17 K
MOMENT 1745 kip-ft
TORQUE 16 kip-ft
38 mph WIND - 0.7500 in ICE
AXIAL
80 K
SHEAR 58 K
MOMENT 5497 kip-ft
TORQUE 56 kip-ft
REACTIONS - 85 mph WIND

FDH Engineering, Inc.
6521 Meridien Drive, Suite 107
Raleigh, North Carolina
Phone: 9197551012
FAX: 9197551031
Tower Analysis

Job: BRG 134 943057 (BU# 807133)	
Project: 1421YV1400	
Client: Crown Castle	Drawn by: Jeffrey B. Ray / App'd:
Code: TIA/EIA-222-F	Date: 01/29/14 / Scale: NTS
Path:	Dwg No. E-1

tnxTower	Job	Page
	BRG 134 943057 (BU# 807133)	1 of 53
FDH Engineering, Inc. 6521 Meridien Drive, Suite 107 Raleigh, North Carolina Phone: 9197551012 FAX: 9197551031	**Project** 1421YV1400	**Date** 16:51:03 01/29/14
	Client Crown Castle	**Designed by** Jeffrey B. Ray

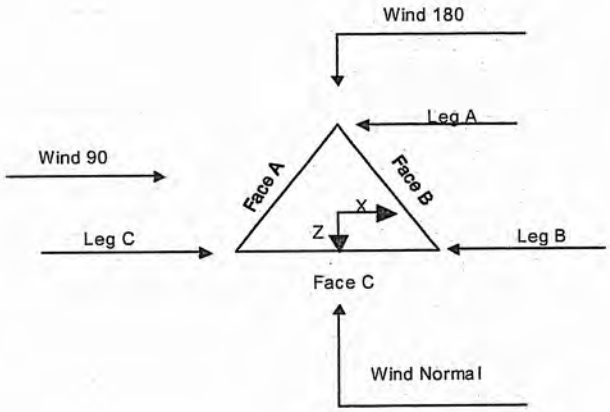
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 6'8-1/4" at the top and 25' at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
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'-160'			6'8-9/32"	1	20'
T2	160'-153'3-31/32"			8'9-1/8"	1	6'8-1/32"
T3	153'3-31/32"-146' 8-1/32"			9'5-13/32"	1	6'8-1/32"
T4	146'8-1/32"-140'			10'1-11/16"	1	6'8-1/32"
T5	140'-120'			10'9-31/32"	1	20'
T6	120'-100'			12'11-1/32"	1	20'
T7	100'-80'			14'10-3/16"	1	20'
T8	80'-70'			16'11-7/8"	1	10'
T9	70'-60'			17'11-7/8"	1	10'
T10	60'-40'			19'	1	20'
T11	40'-20'			21'	1	20'
T12	20'-0'			23'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180'-160'	5'	X Brace	No	No	0.0000	0.0000
T2	160'-153'3-31/32"	6'8-1/32"	X Brace	No	No	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
T3	153'3-31/32"-146' 8-1/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T4	146'8-1/32"-140'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T5	140'-120'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T6	120'-100'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T7	100'-80'	10'	X Brace	No	No	0.0000	0.0000
T8	80'-70'	10'	X Brace	No	No	0.0000	0.0000
T9	70'-60'	10'	X Brace	No	No	0.0000	0.0000
T10	60'-40'	10'	X Brace	No	No	0.0000	0.0000
T11	40'-20'	10'	X Brace	No	No	0.0000	0.0000
T12	20'-0'	10'	X Brace	No	No	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'-160'	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 160'-153'3-31/32"	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T3 153'3-31/32"-146' 8-1/32"	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 146'8-1/32"-140'	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 140'-120'	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 120'-100'	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T7 100'-80'	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T8 80'-70'	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 70'-60'	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T10 60'-40'	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)
T11 40'-20'	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T12 20'-0'	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x5/16x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180'-160'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 153'3-31/32"-146'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
8-1/32" T4 146'8-1/32"-140'	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180'-160'	1	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 180'-160'	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 160'-153'3-31/32"	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T3 153'3-31/32"-146'8-1/32"	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T4 146'8-1/32"-140'	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T5 140'-120'	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T6 120'-100'	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T7 100'-80'	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T8 80'-70'	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T9 70'-60'	0.00	0.3750	A36 (36 ksi)	1	1	1	123.1250	30.0000
T10 60'-40'	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T11 40'-20'	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T12 20'-0'	0.00	0.3750	A36 (36 ksi)	1	1	1	155.6250	30.0000

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'-160'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 160'-153'3-31/32"	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 153'3-31/32"-146'8-1/32"	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 146'8-1/32"-140'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 140'-120'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 120'-100'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 100'-80'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 80'-70'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 70'-60'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 60'-40'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 40'-20'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 20'-0'	Yes	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 Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 180'-160'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160'-153'3-31/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 153'3-31/32"-146'8-1/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 146'8-1/32"-140'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 140'-120'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120'-100'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	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
T7 100'-80'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80'-70'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 70'-60'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60'-40'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 40'-20'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20'-0'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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'-160'	Flange	0.8750 A325X	4	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325N	0
T2 160'-153'3-31/32"	Flange	0.0000 A325X	0	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T3 153'3-31/32"-146'8-1/32"	Flange	0.0000 A325X	0	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T4 146'8-1/32"-140'	Flange	1.0000 A325X	4	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T5 140'-120'	Flange	1.0000 A325X	6	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T6 120'-100'	Flange	1.0000 A325X	6	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T7 100'-80'	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T8 80'-70'	Flange	0.0000 A325X	0	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T9 70'-60'	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T10 60'-40'	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T11 40'-20'	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T12 20'-0'	Flange	1.0000 A449	10	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	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 klf

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Face A												
7983A(1/2")	A	Yes	Ar (CfAe)	157' - 0'	0.0000	-0.45	2	2	0.5800	0.5800		0.00
Feedline Ladder (Af)	A	Yes	Af (CfAe)	157' - 0'	0.0000	-0.4	1	1	3.0000	3.0000	12.0000	0.01
7983A(1/2")	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	1	1	0.5800	0.0000		0.00
2" Rigid Conduit	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	2	2	1.0000	2.0000		0.00
9207(5/16")	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	6	6	0.3300	0.0000		0.00
*												
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4')	A	Yes	Ar (CfAe)	143' - 0'	0.0000	-0.4	3	3	1.0000	1.2500		0.00
*												
LCF158-50JA-A0(1 5/8")	A	Yes	Ar (CfAe)	172' - 0'	0.0500	0	7	3	1.0000	1.9800		0.00
LCF158-50JA-A0(1 5/8")	A	Yes	Ar (CfAe)	172' - 0'	0.0000	0	6	6	1.0000	1.9800		0.00
Feedline Ladder (Af)	A	Yes	Af (CfAe)	172' - 0'	0.0000	0	1	1	3.0000	3.0000	12.0000	0.01
*												
LDF1-50A(1/4")	A	Yes	Ar (CfAe)	12' - 0'	0.0000	0.42	2	2	0.3450	0.3450		0.00
Face B												
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	113' - 0'	0.0000	0.35	6	6	1.0000	1.9800		0.00
Feedline Ladder (Af)	B	Yes	Af (CfAe)	113' - 0'	0.0000	0.35	1	1	3.0000	3.0000	12.0000	0.01
Safety Line 3/8	B	No	Ar (Leg)	180' - 0'	0.0000	0	1	1	0.3750	0.3750		0.00
Face C												
561(1-5/8")	C	Yes	Ar (CfAe)	128' - 0'	-3.0000	-0.3	20	10	1.0000	1.6250		0.00
Feedline Ladder (Af)	C	Yes	Af (CfAe)	128' - 0'	-1.0000	-0.3	2	1	3.0000	3.0000	12.0000	0.01
*												
LDF6-50A(1-1/4")	C	Yes	Ar (CfAe)	134' - 0'	0.0000	0.15	9	9	1.0000	1.5500		0.00
Feedline Ladder (Af)	C	Yes	Af (CfAe)	134' - 0'	0.0000	0.25	1	1	3.0000	3.0000	12.0000	0.01
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	30' - 0'	0.0000	0.15	2	2	0.6300	0.6300		0.00
*												
CR 50 1873(1-5/8")	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	12	8	1.0000	1.9800		0.00
FB-L98-002-XXX(3/8)	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	1	1	0.3937	0.0000		0.00
WR-VG82ST-BRDA(5/8")	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	2	2	0.6450	0.0000		0.00
2" Rigid Conduit	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	1	1	2.0000	2.0000		0.00
**												

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 klf
*							
**							

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'-160'	A	17.820	3.000	0.000	0.000	0.21
		B	0.625	0.000	0.000	0.000	0.00
		C	0.625	0.000	0.000	0.000	0.00
T2	160'-153'3-31/32"	A	10.254	2.583	0.000	0.000	0.15
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T3	153'3-31/32"-146' 8-1/32"	A	10.544	3.333	0.000	0.000	0.18
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T4	146'8-1/32"-140'	A	11.482	3.333	0.000	0.000	0.18
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T5	140'-120'	A	42.550	10.000	0.000	0.000	0.68
		B	0.625	0.000	0.000	0.000	0.00
		C	27.733	5.500	0.000	0.000	0.55
T6	120'-100'	A	44.550	10.000	0.000	0.000	0.74
		B	13.495	3.250	0.000	0.000	0.18
		C	53.932	10.000	0.000	0.000	1.19
T7	100'-80'	A	44.550	10.000	0.000	0.000	0.74
		B	20.425	5.000	0.000	0.000	0.27
		C	80.692	10.000	0.000	0.000	1.43
T8	80'-70'	A	22.275	5.000	0.000	0.000	0.37
		B	10.213	2.500	0.000	0.000	0.14
		C	40.346	5.000	0.000	0.000	0.72
T9	70'-60'	A	22.275	5.000	0.000	0.000	0.37
		B	10.213	2.500	0.000	0.000	0.14
		C	40.346	5.000	0.000	0.000	0.72
T10	60'-40'	A	44.550	10.000	0.000	0.000	0.74
		B	20.425	5.000	0.000	0.000	0.27
		C	80.692	10.000	0.000	0.000	1.43
T11	40'-20'	A	44.550	10.000	0.000	0.000	0.74
		B	20.425	5.000	0.000	0.000	0.27
		C	81.742	10.000	0.000	0.000	1.43
T12	20'-0'	A	45.240	10.000	0.000	0.000	0.74
		B	20.425	5.000	0.000	0.000	0.27
		C	82.792	10.000	0.000	0.000	1.44

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'-160'	A	0.913	7.612	25.077	0.000	0.000	0.75
		B		3.668	0.000	0.000	0.000	0.03
		C		3.668	0.000	0.000	0.000	0.00
T2	160'-153'3-31/32"	A	0.904	4.939	15.565	0.000	0.000	0.48
		B		1.213	0.000	0.000	0.000	0.01

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
		C		1.213	0.000	0.000	0.000	0.00
T3	153'3-31/32"-146' 8-1/32"	A	0.899	5.520	16.899	0.000	0.000	0.53
		B		1.208	0.000	0.000	0.000	0.01
		C		1.208	0.000	0.000	0.000	0.00
T4	146'8-1/32"-140'	A	0.895	6.264	18.017	0.000	0.000	0.55
		B		1.202	0.000	0.000	0.000	0.01
		C		1.202	0.000	0.000	0.000	0.00
T5	140'-120'	A	0.884	29.961	63.554	0.000	0.000	1.98
		B		3.572	0.000	0.000	0.000	0.03
		C		9.706	47.211	0.000	0.000	1.40
T6	120'-100'	A	0.867	33.203	65.801	0.000	0.000	2.07
		B		7.536	20.643	0.000	0.000	0.51
		C		16.401	90.811	0.000	0.000	2.95
T7	100'-80'	A	0.846	32.722	65.710	0.000	0.000	2.04
		B		9.565	31.713	0.000	0.000	0.76
		C		32.289	122.976	0.000	0.000	3.86
T8	80'-70'	A	0.828	16.148	32.814	0.000	0.000	1.01
		B		4.721	15.836	0.000	0.000	0.38
		C		15.931	61.448	0.000	0.000	1.91
T9	70'-60'	A	0.814	15.983	32.783	0.000	0.000	1.00
		B		4.674	15.821	0.000	0.000	0.37
		C		15.767	61.416	0.000	0.000	1.90
T10	60'-40'	A	0.788	31.378	65.454	0.000	0.000	1.97
		B		9.181	31.585	0.000	0.000	0.73
		C		30.945	122.720	0.000	0.000	3.75
T11	40'-20'	A	0.750	30.483	65.283	0.000	0.000	1.92
		B		8.925	31.500	0.000	0.000	0.71
		C		31.825	123.600	0.000	0.000	3.70
T12	20'-0'	A	0.750	32.328	65.973	0.000	0.000	1.94
		B		8.925	31.500	0.000	0.000	0.71
		C		33.600	124.650	0.000	0.000	3.73

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180'-160'	A	0.000	2.927	2.004	3.205
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	160'-153'3-31/32"	A	0.000	1.178	0.994	1.628
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	153'3-31/32"-146'8-1/32"	A	0.000	1.775	1.396	2.322
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	146'8-1/32"-140'	A	0.000	1.880	1.468	2.471
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T5	140'-120'	A	0.000	4.844	3.769	6.849
		B	0.000	0.000	0.000	0.000
		C	0.000	2.761	2.339	3.904
T6	120'-100'	A	0.000	4.853	4.540	8.400
		B	0.000	1.216	1.342	2.105
		C	0.000	5.079	5.269	8.791
T7	100'-80'	A	0.000	3.342	3.759	6.913
		B	0.000	1.292	1.709	2.672

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		C	0.000	5.120	6.207	10.592
T8	80'-70'	A	0.000	1.585	1.833	3.352
		B	0.000	0.614	0.833	1.298
		C	0.000	2.434	3.026	5.147
T9	70'-60'	A	0.000	1.531	1.809	3.294
		B	0.000	0.594	0.822	1.278
		C	0.000	2.356	2.986	5.067
T10	60'-40'	A	0.000	2.897	4.067	7.349
		B	0.000	1.128	1.849	2.862
		C	0.000	4.471	6.714	11.343
T11	40'-20'	A	0.000	2.676	3.995	7.136
		B	0.000	1.047	1.816	2.793
		C	0.000	4.229	6.673	11.276
T12	20'-0'	A	0.000	2.708	3.990	7.221
		B	0.000	1.033	1.791	2.754
		C	0.000	4.247	6.657	11.325

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180'-160'	-4.7379	-2.7354	-1.9088	-1.1020
T2	160'-153'3-31/32"	-8.7735	-3.5417	-5.1270	-1.9076
T3	153'3-31/32"-146'8-1/32"	-9.0908	-2.7480	-5.0130	-1.3047
T4	146'8-1/32"-140'	-10.3418	-2.3691	-5.7462	-1.0780
T5	140'-120'	-11.7523	6.0833	-7.4836	5.8079
T6	120'-100'	-4.2741	11.8940	-2.0716	10.8156
T7	100'-80'	-8.7545	18.0810	-6.6739	16.6355
T8	80'-70'	-8.8613	18.3391	-6.9579	17.3316
T9	70'-60'	-9.2843	19.2364	-7.3222	18.2325
T10	60'-40'	-9.5122	19.7438	-7.5743	18.9726
T11	40'-20'	-10.3192	21.4374	-8.2557	20.6246
T12	20'-0'	-11.1009	22.7567	-8.8245	21.8595

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Empty Pipe Mount	A	From Leg	4.00 0' 0'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.01 0.02 0.03 0.06 0.18
Empty Pipe Mount	B	From Leg	4.00 0'	0.0000	178'	No Ice 1/2" Ice	1.00 1.39	1.00 1.39	0.01 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
			0'			1" Ice	1.70	1.70	0.03
						2" Ice	2.35	2.35	0.06
						4" Ice	3.78	3.78	0.18
Side Arm Mount [SO 306-1]	A	From Leg	2.00	0.0000	178'	No Ice	0.98	2.18	0.04
			0'			1/2" Ice	1.70	3.80	0.06
			0'			1" Ice	2.42	5.42	0.08
						2" Ice	3.86	8.66	0.12
						4" Ice	6.74	15.14	0.20
Side Arm Mount [SO 306-1]	B	From Leg	2.00	0.0000	178'	No Ice	0.98	2.18	0.04
			0'			1/2" Ice	1.70	3.80	0.06
			0'			1" Ice	2.42	5.42	0.08
						2" Ice	3.86	8.66	0.12
						4" Ice	6.74	15.14	0.20
*									
ERICSSON AIR 21 B2A	A	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	B	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	C	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	A	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	B	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	C	From Leg	4.00	0.0000	172'	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0'			1/2" Ice	7.35	6.48	0.17
			1'			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	A	From Leg	4.00	0.0000	172'	No Ice	0.41	0.19	0.01
			0'			1/2" Ice	0.50	0.26	0.01
			1'			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	B	From Leg	4.00	0.0000	172'	No Ice	0.41	0.19	0.01
			0'			1/2" Ice	0.50	0.26	0.01
			1'			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	C	From Leg	4.00	0.0000	172'	No Ice	0.41	0.19	0.01
			0'			1/2" Ice	0.50	0.26	0.01
			1'			1" Ice	0.60	0.33	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
(2) Empty Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	172'	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
(2) Empty Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	172'	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
(2) Empty Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	172'	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
Sector Mount [SM 602-3]	C	None		0.0000	172'	No Ice	33.11	33.11	1.54
						1/2" Ice	44.90	44.90	2.16
						1" Ice	56.69	56.69	2.78
						2" Ice	80.27	80.27	4.01
						4" Ice	127.43	127.43	6.49
*									
Side Arm Mount [SO 311-3]	C	None		0.0000	157'	No Ice	7.28	7.28	0.19
						1/2" Ice	10.93	10.93	0.28
						1" Ice	14.58	14.58	0.38
						2" Ice	21.88	21.88	0.57
						4" Ice	36.48	36.48	0.96
*									
800 MHz RRH	A	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 MHz RRH	B	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 MHz RRH	C	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800MHZ 2X50W RRH	A	From Leg	4.00 0' 2'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800MHZ 2X50W RRH	B	From Leg	4.00 0' 2'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800MHZ 2X50W RRH	C	From Leg	4.00 0' 2'	0.0000	143'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	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" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00 0' -1'	0.0000	143'	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
(3) ACU-A20-N	A	From Leg	4.00 0' -1'	0.0000	143'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	B	From Leg	4.00 0' -1'	0.0000	143'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	C	From Leg	4.00 0' -1'	0.0000	143'	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	143'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	143'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	143'	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
Side Arm Mount [SO 312-3]	C	None		0.0000	143'	No Ice	7.87	7.87	0.21
						1/2" Ice	11.82	11.82	0.32
						1" Ice	15.77	15.77	0.43
						2" Ice	23.67	23.67	0.65
						4" Ice	39.47	39.47	1.08
* LLPX310R w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	134'	No Ice	5.07	2.98	0.05
						1/2" Ice	5.48	3.53	0.08
						1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23

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	8.70	8.13	0.54
LLPX310R w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	134'	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
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	134'	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
(3) DB844H90-XY w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	134'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
(3) DB844H90-XY w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	134'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
(3) DB844H90-XY w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	134'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
FDD_R6_RRH	A	From Leg	4.00 0' 1'	0.0000	134'	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
FDD_R6_RRH	B	From Leg	4.00 0' 1'	0.0000	134'	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
FDD_R6_RRH	C	From Leg	4.00 0' 1'	0.0000	134'	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
Pipe Mount [PM 601-1]	A	From Leg	4.00 0' 0'	0.0000	134'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Sector Mount [SM 502-3]	C	None		0.0000	134'	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
*									
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89

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
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.90 5.35 5.80 6.73 8.73	4.92 5.60 6.28 7.71 10.83	0.03 0.08 0.13 0.26 0.62
(2) DB844H80-XY w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.90 5.35 5.80 6.73 8.73	4.92 5.60 6.28 7.71 10.83	0.03 0.08 0.13 0.26 0.62
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
P65.16.XL.2 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	5.78 6.95 7.83 9.63 13.44	0.06 0.12 0.19 0.36 0.84
GPS_A	B	From Leg	4.00 0' 4'	0.0000	126'	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
RRH2X40-AWS	A	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	C	From Leg	4.00 0'	0.0000	126'	No Ice 1/2" Ice	2.52 2.75	1.59 1.80	0.04 0.06

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'			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.03 0.07 0.11 0.21 0.52
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0' 2'	0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Sector Mount [SM 411-3]	C	None		0.0000	126'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	21.88 30.68 39.48 57.08 92.28	21.88 30.68 39.48 57.08 92.28	1.07 1.48 1.90 2.73 4.40
*									
800 10504 w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
Empty Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	112'	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' 0'	0.0000	112'	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' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice	1.40 2.13 2.68	1.40 2.13 2.68	0.03 0.04 0.06

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" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
Sector Mount [SM 104-3]	C	None		0.0000	112'	No Ice	30.02	30.02	0.95
						1/2" Ice	40.48	40.48	1.40
						1" Ice	50.94	50.94	1.86
						2" Ice	71.86	71.86	2.76
						4" Ice	113.70	113.70	4.57
*									
(2) 7770.00 w/ Mount Pipe	A	From Leg	1.00 0' 0'	0.0000	102'	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						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) 7770.00 w/ Mount Pipe	B	From Leg	1.00 0' 0'	0.0000	102'	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						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) 7770.00 w/ Mount Pipe	C	From Leg	1.00 0' 0'	0.0000	102'	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						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	A	From Leg	1.00 0' 0'	0.0000	102'	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						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) LGP13519	B	From Leg	1.00 0' 0'	0.0000	102'	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						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) LGP13519	C	From Leg	1.00 0' 0'	0.0000	102'	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						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) LGP2140X	A	From Leg	1.00 0' 0'	0.0000	102'	No Ice	1.26	0.38	0.01
						1/2" Ice	1.42	0.49	0.02
						1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
(2) LGP2140X	B	From Leg	1.00 0' 0'	0.0000	102'	No Ice	1.26	0.38	0.01
						1/2" Ice	1.42	0.49	0.02
						1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
(2) LGP2140X	C	From Leg	1.00 0' 0'	0.0000	102'	No Ice	1.26	0.38	0.01
						1/2" Ice	1.42	0.49	0.02
						1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
(2) RRUS-11	A	From Leg	1.00 0' 0'	0.0000	102'	No Ice	2.94	1.25	0.06
						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15

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	5.02	2.82	0.30
(2) RRUS-11	B	From Leg	1.00 0' 0'	0.0000	102'	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) RRUS-11	C	From Leg	1.00 0' 0'	0.0000	102'	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
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	1.00 0' 0'	0.0000	102'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	1.00 0' 0'	0.0000	102'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	1.00 0' 0'	0.0000	102'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	6.36 7.54 8.43 10.24 14.10	0.08 0.14 0.22 0.39 0.89
DC6-48-60-18-8F	B	From Leg	1.00 0' 0'	0.0000	102'	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	0.03 0.06 0.10 0.18 0.40
Empty Mount Pipe	A	From Leg	1.00 0' 0'	0.0000	102'	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	1.00 0' 0'	0.0000	102'	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	1.00 0' 0'	0.0000	102'	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
Sector Mount [SM 301-3]	C	None		0.0000	102'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	29.61 39.80 49.99 70.37 111.13	1.00 1.20 1.40 1.80 2.60	1.30 1.84 2.38 3.46 5.63
* GPS_A	B	From Leg	2.00 0' 0'	0.0000	30'	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

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
GPS_A	C	From Leg	2.00 0' 0'	0.0000	30'	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 701-1]	B	From Leg	1.00 0' 0'	0.0000	30'	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
Side Arm Mount [SO 701-1]	C	From Leg	1.00 0' 0'	0.0000	30'	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
*									
VG-1060	A	From Face	1.00 0' 0'	0.0000	12'	No Ice	0.13	0.13	0.00
						1/2" Ice	0.22	0.22	0.00
						1" Ice	0.31	0.31	0.01
						2" Ice	0.53	0.53	0.01
						4" Ice	1.11	1.11	0.05
GPS_A	A	From Face	1.00 0' 0'	0.0000	12'	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Pipe Mount [PM 601-1]	A	From Face	0.00 0' 0'	0.0000	12'	No Ice	3.00	0.90	0.07
						1/2" Ice	3.74	1.12	0.08
						1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral / Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)		Aperture Area (ft^2)	Weight (K)
VHLP2-18	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0' 0'	-10.0000		157'	2.17	No Ice	3.72	0.03
									1/2" Ice	4.01	0.05
									1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.20
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0' 0'	-40.0000		157'	2.17	No Ice	3.72	0.03
									1/2" Ice	4.01	0.05
									1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.20
VHLP2-23	A	Paraboloid	From	1.00	50.0000		134'	2.17	No Ice	3.72	0.03

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
		w/Shroud (HP)	Leg	0'					1/2" Ice	4.01	0.05
				1'					1" Ice	4.30	0.07
									2" Ice	4.88	0.11
									4" Ice	6.04	0.20
*											

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_z	q_z ksf	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 180'-160'	170'	1.597	0	160.320	A	15.113	29.508	11.688	26.19	0.000	0.000
					B	14.117	12.313		44.22	0.000	0.000
					C	14.117	12.313		44.22	0.000	0.000
T2 160'-153'3-31/32"	156'8-1/32'	1.561	0	63.206	A	6.120	15.263	5.009	23.42	0.000	0.000
					B	4.531	5.217		51.38	0.000	0.000
					C	4.531	5.217		51.38	0.000	0.000
T3 153'3-31/32"-146'8-1/32"	150'	1.541	0	67.816	A	8.199	15.553	5.009	21.09	0.000	0.000
					B	6.262	5.217		43.64	0.000	0.000
					C	6.262	5.217		43.64	0.000	0.000
T4 146'8-1/32"-140'	143'3-31/32"	1.521	0	72.425	A	8.488	16.491	5.009	20.05	0.000	0.000
					B	6.622	5.217		42.31	0.000	0.000
					C	6.622	5.217		42.31	0.000	0.000
T5 140'-120'	130'	1.48	0	246.784	A	22.616	61.127	18.577	22.18	0.000	0.000
					B	16.385	19.202		52.20	0.000	0.000
					C	19.546	46.310		28.21	0.000	0.000
T6 120'-100'	110'	1.411	0	288.763	A	27.674	66.668	22.118	23.44	0.000	0.000
					B	24.123	35.613		37.03	0.000	0.000
					C	26.946	76.050		21.47	0.000	0.000
T7 100'-80'	90'	1.332	0	329.495	A	27.421	66.675	22.125	23.51	0.000	0.000
					B	24.471	42.550		33.01	0.000	0.000
					C	24.973	102.817		17.31	0.000	0.000
T8 80'-70'	75'	1.264	0	182.118	A	14.495	36.674	14.399	28.14	0.000	0.000
					B	12.995	24.612		38.29	0.000	0.000
					C	13.302	54.745		21.16	0.000	0.000
T9 70'-60'	65'	1.214	0	192.171	A	14.982	36.674	14.399	27.88	0.000	0.000
					B	13.468	24.612		37.81	0.000	0.000
					C	13.804	54.745		21.01	0.000	0.000
T10 60'-40'	50'	1.126	0	414.393	A	34.680	73.348	28.798	26.66	0.000	0.000
					B	31.898	49.223		35.50	0.000	0.000
					C	32.032	109.490		20.35	0.000	0.000
T11 40'-20'	30'	1	0	454.393	A	37.177	73.348	28.798	26.06	0.000	0.000
					B	34.356	49.223		34.46	0.000	0.000
					C	34.499	110.540		19.86	0.000	0.000
T12 20'-0'	10'	1	0	494.393	A	39.642	74.038	28.798	25.33	0.000	0.000
					B	36.840	49.223		33.46	0.000	0.000
					C	36.974	111.590		19.38	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z ksf	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 180'-160'	170'	1.597	0	0.9130	163.368	A	35.989	35.361	17.785	24.93	0.000	0.000
						B	14.117	34.344		36.70	0.000	0.000
						C	14.117	34.344		36.70	0.000	0.000
T2 160'-153'3-31/32"	156'8-1/32"	1.561	0	0.9041	64.212	A	18.467	14.060	7.022	21.59	0.000	0.000
						B	4.531	11.512		43.77	0.000	0.000
						C	4.531	11.512		43.77	0.000	0.000
T3 153'3-31/32"-146'8-1/32"	150'	1.541	0	0.8994	68.817	A	20.839	15.535	7.011	19.28	0.000	0.000
						B	6.262	12.997		36.41	0.000	0.000
						C	6.262	12.997		36.41	0.000	0.000
T4 146'8-1/32"-140'	143'3-31/32"	1.521	0	0.8945	73.420	A	22.168	16.414	7.000	18.14	0.000	0.000
						B	6.622	13.233		35.26	0.000	0.000
						C	6.622	13.233		35.26	0.000	0.000
T5 140'-120'	130'	1.48	0	0.8841	249.735	A	73.091	61.187	24.482	18.23	0.000	0.000
						B	16.385	39.643		43.70	0.000	0.000
						C	59.692	43.015		23.84	0.000	0.000
T6 120'-100'	110'	1.411	0	0.8666	291.655	A	79.616	69.088	27.904	18.76	0.000	0.000
						B	40.753	47.058		31.78	0.000	0.000
						C	104.234	52.060		17.85	0.000	0.000
T7 100'-80'	90'	1.332	0	0.8460	332.319	A	79.977	67.395	27.776	18.85	0.000	0.000
						B	50.221	46.287		28.78	0.000	0.000
						C	133.565	65.183		13.98	0.000	0.000
T8 80'-70'	75'	1.264	0	0.8277	183.500	A	40.790	37.083	17.163	22.04	0.000	0.000
						B	25.866	26.627		32.70	0.000	0.000
						C	67.628	36.017		16.56	0.000	0.000
T9 70'-60'	65'	1.214	0	0.8136	193.528	A	41.280	37.049	17.116	21.85	0.000	0.000
						B	26.333	26.677		32.29	0.000	0.000
						C	68.140	36.008		16.43	0.000	0.000
T10 60'-40'	50'	1.126	0	0.7883	417.024	A	86.851	73.875	34.062	21.19	0.000	0.000
						B	57.470	53.446		30.71	0.000	0.000
						C	140.124	71.867		16.07	0.000	0.000
T11 40'-20'	30'	1	0	0.7500	456.896	A	89.320	73.303	33.806	20.79	0.000	0.000
						B	59.879	53.373		29.85	0.000	0.000
						C	143.496	73.092		15.61	0.000	0.000
T12 20'-0'	10'	1	0	0.7500	496.896	A	92.384	76.039	33.806	20.07	0.000	0.000
						B	62.377	54.310		28.97	0.000	0.000
						C	146.957	75.771		15.18	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z ksf	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 180'-160'	170'	1.597	0	160.320	A	15.113	29.508	11.688	26.19	0.000	0.000
					B	14.117	12.313		44.22	0.000	0.000
					C	14.117	12.313		44.22	0.000	0.000
T2 160'-153'3-31/32"	156'8-1/32"	1.561	0	63.206	A	6.120	15.263	5.009	23.42	0.000	0.000
					B	4.531	5.217		51.38	0.000	0.000
					C	4.531	5.217		51.38	0.000	0.000
T3	150'	1.541	0	67.816	A	8.199	15.553	5.009	21.09	0.000	0.000

Section Elevation ft	z ft	K_z	q_z ksf	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
153'3-31/32"-146'8-1/32"					B	6.262	5.217		43.64	0.000	0.000
					C	6.262	5.217		43.64	0.000	0.000
T4 146'8-1/32"-140'	143'3-31/32"	1.521	0	72.425	A	8.488	16.491	5.009	20.05	0.000	0.000
					B	6.622	5.217		42.31	0.000	0.000
					C	6.622	5.217		42.31	0.000	0.000
T5 140'-120'	130'	1.48	0	246.784	A	22.616	61.127	18.577	22.18	0.000	0.000
					B	16.385	19.202		52.20	0.000	0.000
					C	19.546	46.310		28.21	0.000	0.000
T6 120'-100'	110'	1.411	0	288.763	A	27.674	66.668	22.118	23.44	0.000	0.000
					B	24.123	35.613		37.03	0.000	0.000
					C	26.946	76.050		21.47	0.000	0.000
T7 100'-80'	90'	1.332	0	329.495	A	27.421	66.675	22.125	23.51	0.000	0.000
					B	24.471	42.550		33.01	0.000	0.000
					C	24.973	102.817		17.31	0.000	0.000
T8 80'-70'	75'	1.264	0	182.118	A	14.495	36.674	14.399	28.14	0.000	0.000
					B	12.995	24.612		38.29	0.000	0.000
					C	13.302	54.745		21.16	0.000	0.000
T9 70'-60'	65'	1.214	0	192.171	A	14.982	36.674	14.399	27.88	0.000	0.000
					B	13.468	24.612		37.81	0.000	0.000
					C	13.804	54.745		21.01	0.000	0.000
T10 60'-40'	50'	1.126	0	414.393	A	34.680	73.348	28.798	26.66	0.000	0.000
					B	31.898	49.223		35.50	0.000	0.000
					C	32.032	109.490		20.35	0.000	0.000
T11 40'-20'	30'	1	0	454.393	A	37.177	73.348	28.798	26.06	0.000	0.000
					B	34.356	49.223		34.46	0.000	0.000
					C	34.499	110.540		19.86	0.000	0.000
T12 20'-0'	10'	1	0	494.393	A	39.642	74.038	28.798	25.33	0.000	0.000
					B	36.840	49.223		33.46	0.000	0.000
					C	36.974	111.590		19.38	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 klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	1	1	33.098	2.58	0.13	A
			B	0.165	2.718	0.584	1	1	21.306			
			C	0.165	2.718	0.584	1	1	21.306			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	1	1	15.711	1.12	0.17	A
			B	0.154	2.756	0.582	1	1	7.568			
			C	0.154	2.756	0.582	1	1	7.568			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	1	1	18.038	1.25	0.19	A
			B	0.169	2.702	0.585	1	1	9.312			
			C	0.169	2.702	0.585	1	1	9.312			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	1	1	18.888	1.30	0.20	A
			B	0.163	2.723	0.584	1	1	9.667			
			C	0.163	2.723	0.584	1	1	9.667			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	1	1	61.048	4.11	0.21	A
			B	0.144	2.793	0.581	1	1	27.533			
			C	0.267	2.388	0.606	1	1	47.625			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	1	1	69.304	4.74	0.24	C
			B	0.207	2.573	0.592	1	1	45.199			
			C	0.357	2.156	0.635	1	1	75.228			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	1	1	68.199	5.28	0.26	C
			B	0.203	2.585	0.591	1	1	49.622			
			C	0.388	2.089	0.647	1	1	91.466			

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 klf	Ctrl. Face
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	1	1	36.876	2.69	0.27	C
			B	0.206	2.574	0.592	1	1	27.558			
			C	0.374	2.119	0.641	1	1	48.404			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	1	1	37.238	2.63	0.26	C
			B	0.198	2.602	0.59	1	1	27.990			
			C	0.357	2.156	0.635	1	1	48.562			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	1	1	79.031	5.16	0.26	C
			B	0.196	2.61	0.59	1	1	60.917			
			C	0.342	2.191	0.629	1	1	100.954			
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	1	1	81.198	4.81	0.24	C
			B	0.184	2.651	0.587	1	1	63.262			
			C	0.319	2.246	0.622	1	1	103.250			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	1	1	83.840	5.03	0.25	C
			B	0.174	2.685	0.585	1	1	65.658			
			C	0.3	2.295	0.616	1	1	105.719			
Sum Weight:	16.30	31.66						OTM	3344.98 kip-ft	40.71		

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 klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	0.8	1	30.076	2.35	0.12	A
			B	0.165	2.718	0.584	0.8	1	18.483			
			C	0.165	2.718	0.584	0.8	1	18.483			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	0.8	1	14.487	1.03	0.15	A
			B	0.154	2.756	0.582	0.8	1	6.662			
			C	0.154	2.756	0.582	0.8	1	6.662			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	0.8	1	16.398	1.14	0.17	A
			B	0.169	2.702	0.585	0.8	1	8.060			
			C	0.169	2.702	0.585	0.8	1	8.060			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	0.8	1	17.190	1.18	0.18	A
			B	0.163	2.723	0.584	0.8	1	8.342			
			C	0.163	2.723	0.584	0.8	1	8.342			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	0.8	1	56.524	3.81	0.19	A
			B	0.144	2.793	0.581	0.8	1	24.257			
			C	0.267	2.388	0.606	0.8	1	43.715			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	0.8	1	63.769	4.40	0.22	C
			B	0.207	2.573	0.592	0.8	1	40.375			
			C	0.357	2.156	0.635	0.8	1	69.839			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	0.8	1	62.715	4.99	0.25	C
			B	0.203	2.585	0.591	0.8	1	44.728			
			C	0.388	2.089	0.647	0.8	1	86.472			
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	0.8	1	33.977	2.54	0.25	C
			B	0.206	2.574	0.592	0.8	1	24.960			
			C	0.374	2.119	0.641	0.8	1	45.744			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	0.8	1	34.241	2.48	0.25	C
			B	0.198	2.602	0.59	0.8	1	25.296			
			C	0.357	2.156	0.635	0.8	1	45.801			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	0.8	1	72.095	4.84	0.24	C
			B	0.196	2.61	0.59	0.8	1	54.537			
			C	0.342	2.191	0.629	0.8	1	94.548			
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	0.8	1	73.763	4.49	0.22	C
			B	0.184	2.651	0.587	0.8	1	56.391			

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 klf	Ctrl. Face
			C	0.319	2.246	0.622	0.8	1	96.350			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	0.8	1	75.911	4.68	0.23	C
			B	0.174	2.685	0.585	0.8	1	58.290			
			C	0.3	2.295	0.616	0.8	1	98.325			
Sum Weight:	16.30	31.66						OTM	3104.16 kip-ft	37.92		

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 klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	0.85	1	30.831	2.40	0.12	A
			B	0.165	2.718	0.584	0.85	1	19.189			
			C	0.165	2.718	0.584	0.85	1	19.189			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	0.85	1	14.793	1.05	0.16	A
			B	0.154	2.756	0.582	0.85	1	6.888			
			C	0.154	2.756	0.582	0.85	1	6.888			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	0.85	1	16.808	1.17	0.17	A
			B	0.169	2.702	0.585	0.85	1	8.373			
			C	0.169	2.702	0.585	0.85	1	8.373			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	0.85	1	17.615	1.21	0.18	A
			B	0.163	2.723	0.584	0.85	1	8.673			
			C	0.163	2.723	0.584	0.85	1	8.673			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	0.85	1	57.655	3.88	0.19	A
			B	0.144	2.793	0.581	0.85	1	25.076			
			C	0.267	2.388	0.606	0.85	1	44.693			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	0.85	1	65.153	4.49	0.22	C
			B	0.207	2.573	0.592	0.85	1	41.581			
			C	0.357	2.156	0.635	0.85	1	71.186			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	0.85	1	64.086	5.06	0.25	C
			B	0.203	2.585	0.591	0.85	1	45.952			
			C	0.388	2.089	0.647	0.85	1	87.720			
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	0.85	1	34.702	2.58	0.26	C
			B	0.206	2.574	0.592	0.85	1	25.609			
			C	0.374	2.119	0.641	0.85	1	46.409			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	0.85	1	34.990	2.52	0.25	C
			B	0.198	2.602	0.59	0.85	1	25.970			
			C	0.357	2.156	0.635	0.85	1	46.491			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	0.85	1	73.829	4.92	0.25	C
			B	0.196	2.61	0.59	0.85	1	56.132			
			C	0.342	2.191	0.629	0.85	1	96.149			
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	0.85	1	75.622	4.57	0.23	C
			B	0.184	2.651	0.587	0.85	1	58.109			
			C	0.319	2.246	0.622	0.85	1	98.075			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	0.85	1	77.893	4.77	0.24	C
			B	0.174	2.685	0.585	0.85	1	60.132			
			C	0.3	2.295	0.616	0.85	1	100.173			
Sum Weight:	16.30	31.66						OTM	3164.37 kip-ft	38.62		

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 klf	Ctrl. Face
T1 180'-160'	0.79	2.61	A	0.437	1.996	0.667	1	1	59.585	0.77	0.04	A
			B	0.297	2.305	0.615	1	1	35.234			
			C	0.297	2.305	0.615	1	1	35.234			
T2 160'-153'3-31/32"	0.49	1.02	A	0.507	1.892	0.701	1	1	28.321	0.34	0.05	A
			B	0.25	2.438	0.602	1	1	11.459			
			C	0.25	2.438	0.602	1	1	11.459			
T3 153'3-31/32"-146'8-1/32"	0.54	1.20	A	0.529	1.866	0.712	1	1	31.907	0.37	0.06	A
			B	0.28	2.351	0.61	1	1	14.189			
			C	0.28	2.351	0.61	1	1	14.189			
T4 146'8-1/32"-140'	0.56	1.24	A	0.526	1.869	0.711	1	1	33.836	0.39	0.06	A
			B	0.27	2.378	0.607	1	1	14.658			
			C	0.27	2.378	0.607	1	1	14.658			
T5 140'-120'	3.42	3.80	A	0.538	1.856	0.717	1	1	116.989	1.30	0.07	A
			B	0.224	2.517	0.596	1	1	39.999			
			C	0.411	2.042	0.656	1	1	87.921			
T6 120'-100'	5.53	4.65	A	0.51	1.888	0.703	1	1	128.156	1.51	0.08	C
			B	0.301	2.293	0.616	1	1	69.751			
			C	0.536	1.858	0.716	1	1	141.533			
T7 100'-80'	6.67	4.77	A	0.443	1.984	0.67	1	1	125.152	1.78	0.09	C
			B	0.29	2.322	0.613	1	1	78.596			
			C	0.598	1.805	0.752	1	1	182.610			
T8 80'-70'	3.30	2.65	A	0.424	2.018	0.662	1	1	65.333	0.88	0.09	C
			B	0.286	2.334	0.612	1	1	42.154			
			C	0.565	1.83	0.733	1	1	94.018			
T9 70'-60'	3.27	3.78	A	0.405	2.055	0.654	1	1	65.493	0.86	0.09	C
			B	0.274	2.368	0.608	1	1	42.560			
			C	0.538	1.855	0.718	1	1	93.982			
T10 60'-40'	6.45	5.88	A	0.385	2.094	0.646	1	1	134.556	1.65	0.08	C
			B	0.266	2.39	0.606	1	1	89.862			
			C	0.508	1.889	0.702	1	1	190.559			
T11 40'-20'	6.33	7.10	A	0.356	2.158	0.635	1	1	135.838	1.52	0.08	C
			B	0.248	2.444	0.601	1	1	91.975			
			C	0.474	1.936	0.685	1	1	193.535			
T12 20'-0'	6.37	10.91	A	0.339	2.198	0.629	1	1	140.182	1.59	0.08	C
			B	0.235	2.484	0.598	1	1	94.861			
			C	0.448	1.976	0.672	1	1	197.910			
Sum Weight:	43.71	49.60						OTM	1057.94 kip-ft	12.97		

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 klf	Ctrl. Face
T1 180'-160'	0.79	2.61	A	0.437	1.996	0.667	0.8	1	52.387	0.68	0.03	A
			B	0.297	2.305	0.615	0.8	1	32.411			
			C	0.297	2.305	0.615	0.8	1	32.411			
T2 160'-153'3-31/32"	0.49	1.02	A	0.507	1.892	0.701	0.8	1	24.628	0.30	0.04	A
			B	0.25	2.438	0.602	0.8	1	10.553			
			C	0.25	2.438	0.602	0.8	1	10.553			
T3 153'3-31/32"-	0.54	1.20	A	0.529	1.866	0.712	0.8	1	27.739	0.32	0.05	A
			B	0.28	2.351	0.61	0.8	1	12.937			

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 klf	Ctrl. Face
146'8-1/32"			C	0.28	2.351	0.61	0.8	1	12.937			
T4	0.56	1.24	A	0.526	1.869	0.711	0.8	1	29.402	0.34	0.05	A
146'8-1/32"-1			B	0.27	2.378	0.607	0.8	1	13.334			
40'			C	0.27	2.378	0.607	0.8	1	13.334			
T5 140'-120'	3.42	3.80	A	0.538	1.856	0.717	0.8	1	102.371	1.14	0.06	A
			B	0.224	2.517	0.596	0.8	1	36.722			
			C	0.411	2.042	0.656	0.8	1	75.983			
T6 120'-100'	5.53	4.65	A	0.51	1.888	0.703	0.8	1	112.233	1.28	0.06	C
			B	0.301	2.293	0.616	0.8	1	61.601			
			C	0.536	1.858	0.716	0.8	1	120.687			
T7 100'-80'	6.67	4.77	A	0.443	1.984	0.67	0.8	1	109.156	1.52	0.08	C
			B	0.29	2.322	0.613	0.8	1	68.552			
			C	0.598	1.805	0.752	0.8	1	155.897			
T8 80'-70'	3.30	2.65	A	0.424	2.018	0.662	0.8	1	57.175	0.76	0.08	C
			B	0.286	2.334	0.612	0.8	1	36.981			
			C	0.565	1.83	0.733	0.8	1	80.492			
T9 70'-60'	3.27	3.78	A	0.405	2.055	0.654	0.8	1	57.237	0.73	0.07	C
			B	0.274	2.368	0.608	0.8	1	37.293			
			C	0.538	1.855	0.718	0.8	1	80.354			
T10 60'-40'	6.45	5.88	A	0.385	2.094	0.646	0.8	1	117.186	1.40	0.07	C
			B	0.266	2.39	0.606	0.8	1	78.368			
			C	0.508	1.889	0.702	0.8	1	162.534			
T11 40'-20'	6.33	7.10	A	0.356	2.158	0.635	0.8	1	117.975	1.30	0.06	C
			B	0.248	2.444	0.601	0.8	1	79.999			
			C	0.474	1.936	0.685	0.8	1	164.836			
T12 20'-0'	6.37	10.91	A	0.339	2.198	0.629	0.8	1	121.705	1.35	0.07	C
			B	0.235	2.484	0.598	0.8	1	82.386			
			C	0.448	1.976	0.672	0.8	1	168.519			
Sum Weight:	43.71	49.60						OTM	912.59 kip-ft	11.13		

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 klf	Ctrl. Face
T1 180'-160'	0.79	2.61	A	0.437	1.996	0.667	0.85	1	54.187	0.70	0.04	A
			B	0.297	2.305	0.615	0.85	1	33.117			
			C	0.297	2.305	0.615	0.85	1	33.117			
T2	0.49	1.02	A	0.507	1.892	0.701	0.85	1	25.551	0.31	0.05	A
160'-153'3-31/			B	0.25	2.438	0.602	0.85	1	10.779			
32"			C	0.25	2.438	0.602	0.85	1	10.779			
T3	0.54	1.20	A	0.529	1.866	0.712	0.85	1	28.781	0.34	0.05	A
153'3-31/32"-			B	0.28	2.351	0.61	0.85	1	13.250			
146'8-1/32"			C	0.28	2.351	0.61	0.85	1	13.250			
T4	0.56	1.24	A	0.526	1.869	0.711	0.85	1	30.511	0.35	0.05	A
146'8-1/32"-1			B	0.27	2.378	0.607	0.85	1	13.665			
40'			C	0.27	2.378	0.607	0.85	1	13.665			
T5 140'-120'	3.42	3.80	A	0.538	1.856	0.717	0.85	1	106.025	1.18	0.06	A
			B	0.224	2.517	0.596	0.85	1	37.541			
			C	0.411	2.042	0.656	0.85	1	78.967			
T6 120'-100'	5.53	4.65	A	0.51	1.888	0.703	0.85	1	116.213	1.34	0.07	C
			B	0.301	2.293	0.616	0.85	1	63.638			
			C	0.536	1.858	0.716	0.85	1	125.898			
T7 100'-80'	6.67	4.77	A	0.443	1.984	0.67	0.85	1	113.155	1.59	0.08	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
			B	0.29	2.322	0.613	0.85	1	71.063			
			C	0.598	1.805	0.752	0.85	1	162.575			
T8 80'-70'	3.30	2.65	A	0.424	2.018	0.662	0.85	1	59.215	0.79	0.08	C
			B	0.286	2.334	0.612	0.85	1	38.275			
			C	0.565	1.83	0.733	0.85	1	83.873			
T9 70'-60'	3.27	3.78	A	0.405	2.055	0.654	0.85	1	59.301	0.77	0.08	C
			B	0.274	2.368	0.608	0.85	1	38.610			
			C	0.538	1.855	0.718	0.85	1	83.761			
T10 60'-40'	6.45	5.88	A	0.385	2.094	0.646	0.85	1	121.529	1.46	0.07	C
			B	0.266	2.39	0.606	0.85	1	81.242			
			C	0.508	1.889	0.702	0.85	1	169.540			
T11 40'-20'	6.33	7.10	A	0.356	2.158	0.635	0.85	1	122.441	1.35	0.07	C
			B	0.248	2.444	0.601	0.85	1	82.993			
			C	0.474	1.936	0.685	0.85	1	172.011			
T12 20'-0'	6.37	10.91	A	0.339	2.198	0.629	0.85	1	126.324	1.41	0.07	C
			B	0.235	2.484	0.598	0.85	1	85.505			
			C	0.448	1.976	0.672	0.85	1	175.867			
Sum Weight:	43.71	49.60						OTM	948.93 kip-ft	11.59		

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 ft^2	F K	w klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	1	1	33.098	0.89	0.04	A
			B	0.165	2.718	0.584	1	1	21.306			
			C	0.165	2.718	0.584	1	1	21.306			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	1	1	15.711	0.39	0.06	A
			B	0.154	2.756	0.582	1	1	7.568			
			C	0.154	2.756	0.582	1	1	7.568			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	1	1	18.038	0.43	0.06	A
			B	0.169	2.702	0.585	1	1	9.312			
			C	0.169	2.702	0.585	1	1	9.312			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	1	1	18.888	0.45	0.07	A
			B	0.163	2.723	0.584	1	1	9.667			
			C	0.163	2.723	0.584	1	1	9.667			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	1	1	61.048	1.42	0.07	A
			B	0.144	2.793	0.581	1	1	27.533			
			C	0.267	2.388	0.606	1	1	47.625			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	1	1	69.304	1.64	0.08	C
			B	0.207	2.573	0.592	1	1	45.199			
			C	0.357	2.156	0.635	1	1	75.228			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	1	1	68.199	1.83	0.09	C
			B	0.203	2.585	0.591	1	1	49.622			
			C	0.388	2.089	0.647	1	1	91.466			
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	1	1	36.876	0.93	0.09	C
			B	0.206	2.574	0.592	1	1	27.558			
			C	0.374	2.119	0.641	1	1	48.404			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	1	1	37.238	0.91	0.09	C
			B	0.198	2.602	0.59	1	1	27.990			
			C	0.357	2.156	0.635	1	1	48.562			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	1	1	79.031	1.79	0.09	C
			B	0.196	2.61	0.59	1	1	60.917			
			C	0.342	2.191	0.629	1	1	100.954			

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 klf	Ctrl. Face
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	1	1	81.198	1.66	0.08	C
			B	0.184	2.651	0.587	1	1	63.262			
			C	0.319	2.246	0.622	1	1	103.250			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	1	1	83.840	1.74	0.09	C
			B	0.174	2.685	0.585	1	1	65.658			
			C	0.3	2.295	0.616	1	1	105.719			
Sum Weight:	16.30	31.66						OTM	1157.43 kip-ft	14.09		

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 klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	0.8	1	30.076	0.81	0.04	A
			B	0.165	2.718	0.584	0.8	1	18.483			
			C	0.165	2.718	0.584	0.8	1	18.483			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	0.8	1	14.487	0.36	0.05	A
			B	0.154	2.756	0.582	0.8	1	6.662			
			C	0.154	2.756	0.582	0.8	1	6.662			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	0.8	1	16.398	0.39	0.06	A
			B	0.169	2.702	0.585	0.8	1	8.060			
			C	0.169	2.702	0.585	0.8	1	8.060			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	0.8	1	17.190	0.41	0.06	A
			B	0.163	2.723	0.584	0.8	1	8.342			
			C	0.163	2.723	0.584	0.8	1	8.342			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	0.8	1	56.524	1.32	0.07	A
			B	0.144	2.793	0.581	0.8	1	24.257			
			C	0.267	2.388	0.606	0.8	1	43.715			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	0.8	1	63.769	1.52	0.08	C
			B	0.207	2.573	0.592	0.8	1	40.375			
			C	0.357	2.156	0.635	0.8	1	69.839			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	0.8	1	62.715	1.73	0.09	C
			B	0.203	2.585	0.591	0.8	1	44.728			
			C	0.388	2.089	0.647	0.8	1	86.472			
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	0.8	1	33.977	0.88	0.09	C
			B	0.206	2.574	0.592	0.8	1	24.960			
			C	0.374	2.119	0.641	0.8	1	45.744			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	0.8	1	34.241	0.86	0.09	C
			B	0.198	2.602	0.59	0.8	1	25.296			
			C	0.357	2.156	0.635	0.8	1	45.801			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	0.8	1	72.095	1.67	0.08	C
			B	0.196	2.61	0.59	0.8	1	54.537			
			C	0.342	2.191	0.629	0.8	1	94.548			
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	0.8	1	73.763	1.55	0.08	C
			B	0.184	2.651	0.587	0.8	1	56.391			
			C	0.319	2.246	0.622	0.8	1	96.350			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	0.8	1	75.911	1.62	0.08	C
			B	0.174	2.685	0.585	0.8	1	58.290			
			C	0.3	2.295	0.616	0.8	1	98.325			
Sum Weight:	16.30	31.66						OTM	1074.10 kip-ft	13.12		

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 klf	Ctrl. Face
T1 180'-160'	0.22	1.23	A	0.278	2.355	0.61	0.85	1	30.831	0.83	0.04	A
			B	0.165	2.718	0.584	0.85	1	19.189			
			C	0.165	2.718	0.584	0.85	1	19.189			
T2 160'-153'3-31/32"	0.15	0.57	A	0.338	2.199	0.628	0.85	1	14.793	0.36	0.05	A
			B	0.154	2.756	0.582	0.85	1	6.888			
			C	0.154	2.756	0.582	0.85	1	6.888			
T3 153'3-31/32"-146'8-1/32"	0.18	0.64	A	0.35	2.171	0.633	0.85	1	16.808	0.40	0.06	A
			B	0.169	2.702	0.585	0.85	1	8.373			
			C	0.169	2.702	0.585	0.85	1	8.373			
T4 146'8-1/32"-140'	0.18	0.65	A	0.345	2.183	0.631	0.85	1	17.615	0.42	0.06	A
			B	0.163	2.723	0.584	0.85	1	8.673			
			C	0.163	2.723	0.584	0.85	1	8.673			
T5 140'-120'	1.24	2.24	A	0.339	2.197	0.629	0.85	1	57.655	1.34	0.07	A
			B	0.144	2.793	0.581	0.85	1	25.076			
			C	0.267	2.388	0.606	0.85	1	44.693			
T6 120'-100'	2.11	2.73	A	0.327	2.227	0.624	0.85	1	65.153	1.55	0.08	C
			B	0.207	2.573	0.592	0.85	1	41.581			
			C	0.357	2.156	0.635	0.85	1	71.186			
T7 100'-80'	2.44	3.02	A	0.286	2.335	0.612	0.85	1	64.086	1.75	0.09	C
			B	0.203	2.585	0.591	0.85	1	45.952			
			C	0.388	2.089	0.647	0.85	1	87.720			
T8 80'-70'	1.22	1.69	A	0.281	2.348	0.61	0.85	1	34.702	0.89	0.09	C
			B	0.206	2.574	0.592	0.85	1	25.609			
			C	0.374	2.119	0.641	0.85	1	46.409			
T9 70'-60'	1.22	2.45	A	0.269	2.382	0.607	0.85	1	34.990	0.87	0.09	C
			B	0.198	2.602	0.59	0.85	1	25.970			
			C	0.357	2.156	0.635	0.85	1	46.491			
T10 60'-40'	2.44	3.76	A	0.261	2.406	0.605	0.85	1	73.829	1.70	0.09	C
			B	0.196	2.61	0.59	0.85	1	56.132			
			C	0.342	2.191	0.629	0.85	1	96.149			
T11 40'-20'	2.45	4.98	A	0.243	2.458	0.6	0.85	1	75.622	1.58	0.08	C
			B	0.184	2.651	0.587	0.85	1	58.109			
			C	0.319	2.246	0.622	0.85	1	98.075			
T12 20'-0'	2.45	7.71	A	0.23	2.499	0.597	0.85	1	77.893	1.65	0.08	C
			B	0.174	2.685	0.585	0.85	1	60.132			
			C	0.3	2.295	0.616	0.85	1	100.173			
Sum Weight:	16.30	31.66						OTM	1094.94 kip-ft	13.36		

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 ksf	C_AA_C Front ft²	C_AA_C Side ft²
Empty Pipe Mount	0.0000	0.01	0'	-7'11-3/4"	178'	1.619	0	1.00	1.00
Empty Pipe Mount	120.0000	0.01	6'10-29/32"	3'11-7/8"	178'	1.619	0	1.00	1.00
Side Arm Mount [SO 306-1]	0.0000	0.04	0'	-5'11-3/4"	178'	1.619	0	0.98	2.18
Side Arm Mount [SO 306-1]	120.0000	0.04	5'2-5/32"	2'11-7/8"	178'	1.619	0	0.98	2.18

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	0.0000	0.11	0'	-8'4-3/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120.0000	0.11	7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	240.0000	0.11	-7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	0.0000	0.11	0'	-8'4-3/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120.0000	0.11	7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	240.0000	0.11	-7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
KRY 112 144/1	0.0000	0.01	0'	-8'4-3/32"	173'	1.605	0	0.41	0.19
KRY 112 144/1	120.0000	0.01	7'2-5/8"	4'2-1/32"	173'	1.605	0	0.41	0.19
KRY 112 144/1	240.0000	0.01	-7'2-5/8"	4'2-1/32"	173'	1.605	0	0.41	0.19
Empty Mount Pipe	0.0000	0.06	0'	-8'4-3/32"	172'	1.603	0	2.80	2.80
Empty Mount Pipe	120.0000	0.06	7'2-5/8"	4'2-1/32"	172'	1.603	0	2.80	2.80
Empty Mount Pipe	240.0000	0.06	-7'2-5/8"	4'2-1/32"	172'	1.603	0	2.80	2.80
Sector Mount [SM 602-3]	0.0000	1.54	0'	0'	172'	1.603	0	33.11	33.11
Side Arm Mount [SO 311-3]	0.0000	0.19	0'	0'	157'	1.561	0	7.28	7.28
800 MHz RRH	0.0000	0.05	0'	-10'31/32'	142'	1.517	0	2.49	2.07
800 MHz RRH	120.0000	0.05	8'8-3/4"	5'15/32"	142'	1.517	0	2.49	2.07
800 MHz RRH	240.0000	0.05	-8'8-3/4"	5'15/32"	142'	1.517	0	2.49	2.07
800MHZ 2X50W RRH	0.0000	0.05	0'	-10'31/32'	145'	1.526	0	2.49	2.07
800MHZ 2X50W RRH	120.0000	0.05	8'8-3/4"	5'15/32"	145'	1.526	0	2.49	2.07
800MHZ 2X50W RRH	240.0000	0.05	-8'8-3/4"	5'15/32"	145'	1.526	0	2.49	2.07
PCS 1900MHz 4x45W-65MHz	0.0000	0.06	0'	-10'31/32'	142'	1.517	0	2.71	2.61
PCS 1900MHz 4x45W-65MHz	120.0000	0.06	8'8-3/4"	5'15/32"	142'	1.517	0	2.71	2.61
PCS 1900MHz 4x45W-65MHz	240.0000	0.06	-8'8-3/4"	5'15/32"	142'	1.517	0	2.71	2.61
ACU-A20-N	0.0000	0.00	0'	-10'31/32'	142'	1.517	0	0.23	0.41
ACU-A20-N	120.0000	0.00	8'8-3/4"	5'15/32"	142'	1.517	0	0.23	0.41
ACU-A20-N	240.0000	0.00	-8'8-3/4"	5'15/32"	142'	1.517	0	0.23	0.41
APXVSPP18-C-A20 w/ Mount Pipe	0.0000	0.08	0'	-10'31/32'	145'	1.526	0	8.50	6.95
APXVSPP18-C-A20 w/ Mount Pipe	120.0000	0.08	8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
APXVSPP18-C-A20 w/ Mount Pipe	240.0000	0.08	-8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
Side Arm Mount [SO 312-3]	0.0000	0.21	0'	0'	143'	1.520	0	7.87	7.87
LLPX310R w/ Mount Pipe	0.0000	0.05	0'	-10'7-7/16"	135'	1.496	0	5.07	2.98
LLPX310R w/ Mount Pipe	120.0000	0.05	9'2-9/32"	5'3-23/32'	135'	1.496	0	5.07	2.98
LLPX310R w/ Mount Pipe	240.0000	0.05	-9'2-9/32"	5'3-23/32'	135'	1.496	0	5.07	2.98
DB844H90-XY w/ Mount Pipe	0.0000	0.09	0'	-10'7-7/16"	135'	1.496	0	9.31	15.46
DB844H90-XY w/ Mount Pipe	120.0000	0.09	9'2-9/32"	5'3-23/32'	135'	1.496	0	9.31	15.46
DB844H90-XY w/ Mount Pipe	240.0000	0.09	-9'2-9/32"	5'3-23/32'	135'	1.496	0	9.31	15.46
FDD_R6_RRH	0.0000	0.03	0'	-10'7-7/1	135'	1.496	0	1.79	0.78

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
FDD_R6_RRH	120.0000	0.03	9'2-9/32"	5'3-23/32"	135'	1.496	0	1.79	0.78
FDD_R6_RRH	240.0000	0.03	-9'2-9/32"	5'3-23/32"	135'	1.496	0	1.79	0.78
Pipe Mount [PM 601-1]	0.0000	0.07	0'	-10'7-7/16"	134'	1.492	0	3.00	0.90
Sector Mount [SM 502-3]	0.0000	1.67	0'	0'	134'	1.492	0	33.02	33.02
LNX-6514DS-T4M w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/16"	128'	1.473	0	8.57	7.00
LNX-6514DS-T4M w/ Mount Pipe	120.0000	0.06	9'7-5/16"	5'6-19/32"	128'	1.473	0	8.57	7.00
DB844G65ZAXY w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/16"	128'	1.473	0	9.81	9.84
DB844H80-XY w/ Mount Pipe	120.0000	0.06	9'7-5/16"	5'6-19/32"	128'	1.473	0	6.21	10.31
DB844G65ZAXY w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32"	128'	1.473	0	9.81	9.84
MG D3-800TV w/ Mount Pipe	0.0000	0.04	0'	-11'1-3/16"	128'	1.473	0	3.57	3.42
MG D3-800TV w/ Mount Pipe	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
MG D3-800TV w/ Mount Pipe	240.0000	0.04	-9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
P65.16.XL.2 w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32"	128'	1.473	0	8.64	5.78
GPS_A	120.0000	0.00	9'7-5/16"	5'6-19/32"	130'	1.480	0	0.30	0.30
RRH2X40-AWS	0.0000	0.04	0'	-11'1-3/16"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	240.0000	0.04	-9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
MG D3-800Tx w/ Mount Pipe	0.0000	0.03	0'	-11'1-3/16"	128'	1.473	0	3.57	3.42
MG D3-800Tx w/ Mount Pipe	120.0000	0.03	9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
MG D3-800Tx w/ Mount Pipe	240.0000	0.03	-9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
DB-T1-6Z-8AB-0Z	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	5.60	2.33
Sector Mount [SM 411-3]	0.0000	1.07	0'	0'	126'	1.466	0	21.88	21.88
800 10504 w/ Mount Pipe	0.0000	0.04	0'	-11'10-13/16"	112'	1.418	0	3.59	3.18
800 10504 w/ Mount Pipe	120.0000	0.04	10'3-23/32"	5'11-13/32"	112'	1.418	0	3.59	3.18
800 10504 w/ Mount Pipe	240.0000	0.04	-10'3-23/32"	5'11-13/32"	112'	1.418	0	3.59	3.18
Empty Mount Pipe	0.0000	0.03	0'	-11'10-13/16"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	120.0000	0.03	10'3-23/32"	5'11-13/32"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-10'3-23/32"	5'11-13/32"	112'	1.418	0	1.40	1.40
Sector Mount [SM 104-3]	0.0000	0.95	0'	0'	112'	1.418	0	30.02	30.02
7770.00 w/ Mount Pipe	0.0000	0.12	0'	-9'5-17/32"	102'	1.380	0	12.24	8.51

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
7770.00 w/ Mount Pipe	120.0000	0.12	8'2-13/32"	4'8-3/4"	102'	1.380	0	12.24	8.51
7770.00 w/ Mount Pipe	240.0000	0.12	-8'2-13/32"	4'8-3/4"	102'	1.380	0	12.24	8.51
LGP13519	0.0000	0.01	0'	-9'5-17/32"	102'	1.380	0	0.68	0.41
LGP13519	120.0000	0.01	8'2-13/32"	4'8-3/4"	102'	1.380	0	0.68	0.41
LGP13519	240.0000	0.01	-8'2-13/32"	4'8-3/4"	102'	1.380	0	0.68	0.41
LGP2140X	0.0000	0.02	0'	-9'5-17/32"	102'	1.380	0	2.52	0.76
LGP2140X	120.0000	0.02	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	0.76
LGP2140X	240.0000	0.02	-8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	0.76
RRUS-11	0.0000	0.12	0'	-9'5-17/32"	102'	1.380	0	5.88	2.49
RRUS-11	120.0000	0.12	8'2-13/32"	4'8-3/4"	102'	1.380	0	5.88	2.49
RRUS-11	240.0000	0.12	-8'2-13/32"	4'8-3/4"	102'	1.380	0	5.88	2.49
P65-16-XLH-RR w/ Mount Pipe	0.0000	0.08	0'	-9'5-17/32"	102'	1.380	0	8.64	6.36
P65-16-XLH-RR w/ Mount Pipe	120.0000	0.08	8'2-13/32"	4'8-3/4"	102'	1.380	0	8.64	6.36
P65-16-XLH-RR w/ Mount Pipe	240.0000	0.08	-8'2-13/32"	4'8-3/4"	102'	1.380	0	8.64	6.36
DC6-48-60-18-8F	120.0000	0.03	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.57	4.32
Empty Mount Pipe	0.0000	0.03	0'	-9'5-17/32"	102'	1.380	0	1.40	1.40
Empty Mount Pipe	120.0000	0.03	8'2-13/32"	4'8-3/4"	102'	1.380	0	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-8'2-13/32"	4'8-3/4"	102'	1.380	0	1.40	1.40
Sector Mount [SM 301-3]	0.0000	1.30	0'	0'	102'	1.380	0	29.61	1.00
GPS_A	120.0000	0.00	12'8-3/4"	7'4-3/16"	30'	1.000	0	0.30	0.30
GPS_A	240.0000	0.00	-12'8-3/4"	7'4-3/16"	30'	1.000	0	0.30	0.30
Side Arm Mount [SO 701-1]	120.0000	0.07	11'10-7/16"	6'10-3/16"	30'	1.000	0	0.85	1.67
Side Arm Mount [SO 701-1]	240.0000	0.07	-11'10-7/16"	6'10-3/16"	30'	1.000	0	0.85	1.67
VG-1060	300.0000	0.00	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.13	0.13
GPS_A	300.0000	0.00	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.30	0.30
Pipe Mount [PM 601-1]	300.0000	0.07	-5'11-13/32"	-3'5-9/32"	12'	1.000	0	3.00	0.90
	Sum Weight:	11.52							

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 ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Empty Pipe Mount	0.0000	0.03	0'	-7'11-3/4"	178'	1.619	0	1.65	1.65	0.9181
Empty Pipe Mount	120.0000	0.03	6'10-29/32"	3'11-7/8"	178'	1.619	0	1.65	1.65	0.9181
Side Arm Mount [SO 306-1]	0.0000	0.08	0'	-5'11-3/4"	178'	1.619	0	2.30	5.15	0.9181
Side Arm Mount [SO 306-1]	120.0000	0.08	5'2-5/32"	2'11-7/8"	178'	1.619	0	2.30	5.15	0.9181
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	0.0000	0.22	0'	-8'4-3/32"	173'	1.605	0	7.77	7.12	0.9143
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120.0000	0.22	7'2-5/8"	4'2-1/32"	173'	1.605	0	7.77	7.12	0.9143
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	240.0000	0.22	-7'2-5/8"	4'2-1/32"	173'	1.605	0	7.77	7.12	0.9143
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	0.0000	0.22	0'	-8'4-3/32"	173'	1.605	0	7.77	7.12	0.9143
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120.0000	0.22	7'2-5/8"	4'2-1/32"	173'	1.605	0	7.77	7.12	0.9143
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	240.0000	0.22	-7'2-5/8"	4'2-1/32"	173'	1.605	0	7.77	7.12	0.9143
KRY 112 144/1	0.0000	0.02	0'	-8'4-3/32"	173'	1.605	0	0.58	0.32	0.9143
KRY 112 144/1	120.0000	0.02	7'2-5/8"	4'2-1/32"	173'	1.605	0	0.58	0.32	0.9143
KRY 112 144/1	240.0000	0.02	-7'2-5/8"	4'2-1/32"	173'	1.605	0	0.58	0.32	0.9143
Empty Mount Pipe	0.0000	0.11	0'	-8'4-3/32"	172'	1.603	0	5.17	5.17	0.9143
Empty Mount Pipe	120.0000	0.11	7'2-5/8"	4'2-1/32"	172'	1.603	0	5.17	5.17	0.9143
Empty Mount Pipe	240.0000	0.11	-7'2-5/8"	4'2-1/32"	172'	1.603	0	5.17	5.17	0.9143
Sector Mount [SM 602-3]	0.0000	2.67	0'	0'	172'	1.603	0	54.67	54.67	0.9143
Side Arm Mount [SO 311-3]	0.0000	0.36	0'	0'	157'	1.561	0	13.88	13.88	0.9044
800 MHz RRH	0.0000	0.09	0'	-10'31/32"	142'	1.517	0	2.88	2.44	0.8943
800 MHz RRH	120.0000	0.09	8'8-3/4"	5'15/32"	142'	1.517	0	2.88	2.44	0.8943
800 MHz RRH	240.0000	0.09	-8'8-3/4"	5'15/32"	142'	1.517	0	2.88	2.44	0.8943
800MHZ 2X50W RRH	0.0000	0.09	0'	-10'31/32"	145'	1.526	0	2.88	2.44	0.8943
800MHZ 2X50W RRH	120.0000	0.09	8'8-3/4"	5'15/32"	145'	1.526	0	2.88	2.44	0.8943
800MHZ 2X50W RRH	240.0000	0.09	-8'8-3/4"	5'15/32"	145'	1.526	0	2.88	2.44	0.8943
PCS 1900MHz 4x45W-65MHz	0.0000	0.10	0'	-10'31/32"	142'	1.517	0	3.14	3.04	0.8943
PCS 1900MHz 4x45W-65MHz	120.0000	0.10	8'8-3/4"	5'15/32"	142'	1.517	0	3.14	3.04	0.8943
PCS 1900MHz 4x45W-65MHz	240.0000	0.10	-8'8-3/4"	5'15/32"	142'	1.517	0	3.14	3.04	0.8943
ACU-A20-N	0.0000	0.01	0'	-10'31/32"	142'	1.517	0	0.49	0.71	0.8943
ACU-A20-N	120.0000	0.01	8'8-3/4"	5'15/32"	142'	1.517	0	0.49	0.71	0.8943
ACU-A20-N	240.0000	0.01	-8'8-3/4"	5'15/32"	142'	1.517	0	0.49	0.71	0.8943
APXVSPP18-C-A20 w/ Mount Pipe	0.0000	0.21	0'	-10'31/32"	145'	1.526	0	9.64	8.83	0.8943
APXVSPP18-C-A20 w/ Mount Pipe	120.0000	0.21	8'8-3/4"	5'15/32"	145'	1.526	0	9.64	8.83	0.8943
APXVSPP18-C-A20 w/ Mount Pipe	240.0000	0.21	-8'8-3/4"	5'15/32"	145'	1.526	0	9.64	8.83	0.8943
Side Arm Mount [SO 312-3]	0.0000	0.41	0'	0'	143'	1.520	0	14.93	14.93	0.8943
LLPX310R w/ Mount Pipe	0.0000	0.12	0'	-10'7-7/16"	135'	1.496	0	5.81	3.96	0.8873
LLPX310R w/ Mount Pipe	120.0000	0.12	9'2-9/32"	5'3-23/32"	135'	1.496	0	5.81	3.96	0.8873
LLPX310R w/ Mount Pipe	240.0000	0.12	-9'2-9/32"	5'3-23/32"	135'	1.496	0	5.81	3.96	0.8873

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
DB844H90-XY w/ Mount Pipe	0.0000	0.31	0'	-10'7-7/16"	135'	1.496	0	11.36	19.10	0.8873
DB844H90-XY w/ Mount Pipe	120.0000	0.31	9'2-9/32"	5'3-23/32"	135'	1.496	0	11.36	19.10	0.8873
DB844H90-XY w/ Mount Pipe	240.0000	0.31	-9'2-9/32"	5'3-23/32"	135'	1.496	0	11.36	19.10	0.8873
FDD_R6_RRH	0.0000	0.06	0'	-10'7-7/16"	135'	1.496	0	2.12	1.03	0.8873
FDD_R6_RRH	120.0000	0.06	9'2-9/32"	5'3-23/32"	135'	1.496	0	2.12	1.03	0.8873
FDD_R6_RRH	240.0000	0.06	-9'2-9/32"	5'3-23/32"	135'	1.496	0	2.12	1.03	0.8873
Pipe Mount [PM 601-1]	0.0000	0.09	0'	-10'7-7/16"	134'	1.492	0	4.31	1.29	0.8873
Sector Mount [SM 502-3]	0.0000	2.65	0'	0'	134'	1.492	0	58.47	58.47	0.8873
LNX-6514DS-T4M w/ Mount Pipe	0.0000	0.18	0'	-11'1-3/16"	128'	1.473	0	9.69	8.87	0.8808
LNX-6514DS-T4M w/ Mount Pipe	120.0000	0.18	9'7-5/16"	5'6-19/32"	128'	1.473	0	9.69	8.87	0.8808
DB844G65ZAXY w/ Mount Pipe	0.0000	0.24	0'	-11'1-3/16"	128'	1.473	0	11.38	12.24	0.8808
DB844H80-XY w/ Mount Pipe	120.0000	0.20	9'7-5/16"	5'6-19/32"	128'	1.473	0	7.57	12.72	0.8808
DB844G65ZAXY w/ Mount Pipe	240.0000	0.24	-9'7-5/16"	5'6-19/32"	128'	1.473	0	11.38	12.24	0.8808
MG D3-800TV w/ Mount Pipe	0.0000	0.10	0'	-11'1-3/16"	128'	1.473	0	4.29	4.63	0.8808
MG D3-800TV w/ Mount Pipe	120.0000	0.10	9'7-5/16"	5'6-19/32"	128'	1.473	0	4.29	4.63	0.8808
MG D3-800TV w/ Mount Pipe	240.0000	0.10	-9'7-5/16"	5'6-19/32"	128'	1.473	0	4.29	4.63	0.8808
P65.16.XL.2 w/ Mount Pipe	240.0000	0.18	-9'7-5/16"	5'6-19/32"	128'	1.473	0	9.76	7.62	0.8808
GPS_A	120.0000	0.01	9'7-5/16"	5'6-19/32"	130'	1.480	0	0.44	0.44	0.8808
RRH2X40-AWS	0.0000	0.08	0'	-11'1-3/16"	128'	1.473	0	2.94	1.96	0.8808
RRH2X40-AWS	120.0000	0.08	9'7-5/16"	5'6-19/32"	128'	1.473	0	2.94	1.96	0.8808
RRH2X40-AWS	240.0000	0.08	-9'7-5/16"	5'6-19/32"	128'	1.473	0	2.94	1.96	0.8808
MG D3-800Tx w/ Mount Pipe	0.0000	0.10	0'	-11'1-3/16"	128'	1.473	0	4.29	4.63	0.8808
MG D3-800Tx w/ Mount Pipe	120.0000	0.10	9'7-5/16"	5'6-19/32"	128'	1.473	0	4.29	4.63	0.8808
MG D3-800Tx w/ Mount Pipe	240.0000	0.10	-9'7-5/16"	5'6-19/32"	128'	1.473	0	4.29	4.63	0.8808
DB-T1-6Z-8AB-0Z	120.0000	0.11	9'7-5/16"	5'6-19/32"	128'	1.473	0	6.16	2.74	0.8808
Sector Mount [SM 411-3]	0.0000	1.80	0'	0'	126'	1.466	0	37.38	37.38	0.8808
800 10504 w/ Mount Pipe	0.0000	0.10	0'	-11'10-13/16"	112'	1.418	0	4.31	4.40	0.8685
800 10504 w/ Mount Pipe	120.0000	0.10	10'3-23/32"	5'11-13/32"	112'	1.418	0	4.31	4.40	0.8685
800 10504 w/ Mount Pipe	240.0000	0.10	-10'3-23/32"	5'11-13/32"	112'	1.418	0	4.31	4.40	0.8685
Empty Mount Pipe	0.0000	0.05	0'	-11'10-13/16"	112'	1.418	0	2.53	2.53	0.8685
Empty Mount Pipe	120.0000	0.05	10'3-23/3	5'11-13/3	112'	1.418	0	2.53	2.53	0.8685

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Empty Mount Pipe	240.0000	0.05	-10'3-23/32"	5'11-13/32"	112'	1.418	0	2.53	2.53	0.8685
Sector Mount [SM 104-3]	0.0000	1.74	0'	0'	112'	1.418	0	48.19	48.19	0.8685
7770.00 w/ Mount Pipe	0.0000	0.28	0'	-9'5-17/32"	102'	1.380	0	13.97	11.03	0.8588
7770.00 w/ Mount Pipe	120.0000	0.28	8'2-13/32"	4'8-3/4"	102'	1.380	0	13.97	11.03	0.8588
7770.00 w/ Mount Pipe	240.0000	0.28	-8'2-13/32"	4'8-3/4"	102'	1.380	0	13.97	11.03	0.8588
LGP13519	0.0000	0.02	0'	-9'5-17/32"	102'	1.380	0	0.98	0.68	0.8588
LGP13519	120.0000	0.02	8'2-13/32"	4'8-3/4"	102'	1.380	0	0.98	0.68	0.8588
LGP13519	240.0000	0.02	-8'2-13/32"	4'8-3/4"	102'	1.380	0	0.98	0.68	0.8588
LGP2140X	0.0000	0.06	0'	-9'5-17/32"	102'	1.380	0	3.07	1.16	0.8588
LGP2140X	120.0000	0.06	8'2-13/32"	4'8-3/4"	102'	1.380	0	3.07	1.16	0.8588
LGP2140X	240.0000	0.06	-8'2-13/32"	4'8-3/4"	102'	1.380	0	3.07	1.16	0.8588
RRUS-11	0.0000	0.18	0'	-9'5-17/32"	102'	1.380	0	6.69	3.08	0.8588
RRUS-11	120.0000	0.18	8'2-13/32"	4'8-3/4"	102'	1.380	0	6.69	3.08	0.8588
RRUS-11	240.0000	0.18	-8'2-13/32"	4'8-3/4"	102'	1.380	0	6.69	3.08	0.8588
P65-16-XLH-RR w/ Mount Pipe	0.0000	0.20	0'	-9'5-17/32"	102'	1.380	0	9.73	8.18	0.8588
P65-16-XLH-RR w/ Mount Pipe	120.0000	0.20	8'2-13/32"	4'8-3/4"	102'	1.380	0	9.73	8.18	0.8588
P65-16-XLH-RR w/ Mount Pipe	240.0000	0.20	-8'2-13/32"	4'8-3/4"	102'	1.380	0	9.73	8.18	0.8588
DC6-48-60-18-8F	120.0000	0.09	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.97	4.80	0.8588
Empty Mount Pipe	0.0000	0.05	0'	-9'5-17/32"	102'	1.380	0	2.52	2.52	0.8588
Empty Mount Pipe	120.0000	0.05	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	2.52	0.8588
Empty Mount Pipe	240.0000	0.05	-8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	2.52	0.8588
Sector Mount [SM 301-3]	0.0000	2.23	0'	0'	102'	1.380	0	47.11	1.34	0.8588
GPS_A	120.0000	0.01	12'8-3/4"	7'4-3/16"	30'	1.000	0	0.42	0.42	0.7500
GPS_A	240.0000	0.01	-12'8-3/4"	7'4-3/16"	30'	1.000	0	0.42	0.42	0.7500
Side Arm Mount [SO 701-1]	120.0000	0.09	11'10-7/16"	6'10-3/16"	30'	1.000	0	1.28	2.67	0.7500
Side Arm Mount [SO 701-1]	240.0000	0.09	-11'10-7/16"	6'10-3/16"	30'	1.000	0	1.28	2.67	0.7500
VG-1060	300.0000	0.00	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.26	0.26	0.7500
GPS_A	300.0000	0.01	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.42	0.42	0.7500
Pipe Mount [PM 601-1]	300.0000	0.09	-5'11-13/32"	-3'5-9/32"	12'	1.000	0	4.11	1.23	0.7500
	Sum Weight:	22.22								

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 ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Empty Pipe Mount	0.0000	0.01	0'	-7'11-3/4"	178'	1.619	0	1.00	1.00
Empty Pipe Mount	120.0000	0.01	6'10-29/32"	3'11-7/8"	178'	1.619	0	1.00	1.00
Side Arm Mount [SO 306-1]	0.0000	0.04	0'	-5'11-3/4"	178'	1.619	0	0.98	2.18
Side Arm Mount [SO 306-1]	120.0000	0.04	5'2-5/32"	2'11-7/8"	178'	1.619	0	0.98	2.18
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	0.0000	0.11	0'	-8'4-3/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120.0000	0.11	7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	240.0000	0.11	-7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	0.0000	0.11	0'	-8'4-3/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120.0000	0.11	7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	240.0000	0.11	-7'2-5/8"	4'2-1/32"	173'	1.605	0	6.83	5.64
KRY 112 144/1	0.0000	0.01	0'	-8'4-3/32"	173'	1.605	0	0.41	0.19
KRY 112 144/1	120.0000	0.01	7'2-5/8"	4'2-1/32"	173'	1.605	0	0.41	0.19
KRY 112 144/1	240.0000	0.01	-7'2-5/8"	4'2-1/32"	173'	1.605	0	0.41	0.19
Empty Mount Pipe	0.0000	0.06	0'	-8'4-3/32"	172'	1.603	0	2.80	2.80
Empty Mount Pipe	120.0000	0.06	7'2-5/8"	4'2-1/32"	172'	1.603	0	2.80	2.80
Empty Mount Pipe	240.0000	0.06	-7'2-5/8"	4'2-1/32"	172'	1.603	0	2.80	2.80
Sector Mount [SM 602-3]	0.0000	1.54	0'	0'	172'	1.603	0	33.11	33.11
Side Arm Mount [SO 311-3]	0.0000	0.19	0'	0'	157'	1.561	0	7.28	7.28
800 MHz RRH	0.0000	0.05	0'	-10'31/32"	142'	1.517	0	2.49	2.07
800 MHz RRH	120.0000	0.05	8'8-3/4"	5'15/32"	142'	1.517	0	2.49	2.07
800 MHz RRH	240.0000	0.05	-8'8-3/4"	5'15/32"	142'	1.517	0	2.49	2.07
800MHZ 2X50W RRH	0.0000	0.05	0'	-10'31/32"	145'	1.526	0	2.49	2.07
800MHZ 2X50W RRH	120.0000	0.05	8'8-3/4"	5'15/32"	145'	1.526	0	2.49	2.07
800MHZ 2X50W RRH	240.0000	0.05	-8'8-3/4"	5'15/32"	145'	1.526	0	2.49	2.07
PCS 1900MHz 4x45W-65MHz	0.0000	0.06	0'	-10'31/32"	142'	1.517	0	2.71	2.61
PCS 1900MHz 4x45W-65MHz	120.0000	0.06	8'8-3/4"	5'15/32"	142'	1.517	0	2.71	2.61
PCS 1900MHz 4x45W-65MHz	240.0000	0.06	-8'8-3/4"	5'15/32"	142'	1.517	0	2.71	2.61
ACU-A20-N	0.0000	0.00	0'	-10'31/32"	142'	1.517	0	0.23	0.41
ACU-A20-N	120.0000	0.00	8'8-3/4"	5'15/32"	142'	1.517	0	0.23	0.41
ACU-A20-N	240.0000	0.00	-8'8-3/4"	5'15/32"	142'	1.517	0	0.23	0.41
APXVSPP18-C-A20 w/ Mount Pipe	0.0000	0.08	0'	-10'31/32"	145'	1.526	0	8.50	6.95
APXVSPP18-C-A20 w/ Mount Pipe	120.0000	0.08	8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
APXVSPP18-C-A20 w/ Mount Pipe	240.0000	0.08	-8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
Side Arm Mount [SO 312-3]	0.0000	0.21	0'	0'	143'	1.520	0	7.87	7.87
LLPX310R w/ Mount	0.0000	0.05	0'	-10'7-7/1	135'	1.496	0	5.07	2.98

tnxTower	Job: BRG 134 943057 (BU# 807133)	Page: 37 of 53
FDH Engineering, Inc. 6521 Meridien Drive, Suite 107 Raleigh, North Carolina Phone: 9197551012 FAX: 9197551031	Project: 1421YV1400	Date: 16:51:03 01/29/14
	Client: Crown Castle	Designed by: Jeffrey B. Ray

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Pipe									
LLPX310R w/ Mount Pipe	120.0000	0.05	9'2-9/32"	5'3-23/32"	135'	1.496	0	5.07	2.98
LLPX310R w/ Mount Pipe	240.0000	0.05	-9'2-9/32"	5'3-23/32"	135'	1.496	0	5.07	2.98
DB844H90-XY w/ Mount Pipe	0.0000	0.09	0'	-10'7-7/16"	135'	1.496	0	9.31	15.46
DB844H90-XY w/ Mount Pipe	120.0000	0.09	9'2-9/32"	5'3-23/32"	135'	1.496	0	9.31	15.46
DB844H90-XY w/ Mount Pipe	240.0000	0.09	-9'2-9/32"	5'3-23/32"	135'	1.496	0	9.31	15.46
FDD_R6_RRH	0.0000	0.03	0'	-10'7-7/16"	135'	1.496	0	1.79	0.78
FDD_R6_RRH	120.0000	0.03	9'2-9/32"	5'3-23/32"	135'	1.496	0	1.79	0.78
FDD_R6_RRH	240.0000	0.03	-9'2-9/32"	5'3-23/32"	135'	1.496	0	1.79	0.78
Pipe Mount [PM 601-1]	0.0000	0.07	0'	-10'7-7/16"	134'	1.492	0	3.00	0.90
Sector Mount [SM 502-3]	0.0000	1.67	0'	0'	134'	1.492	0	33.02	33.02
LNX-6514DS-T4M w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/16"	128'	1.473	0	8.57	7.00
LNX-6514DS-T4M w/ Mount Pipe	120.0000	0.06	9'7-5/16"	5'6-19/32"	128'	1.473	0	8.57	7.00
DB844G65ZAXY w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/16"	128'	1.473	0	9.81	9.84
DB844H80-XY w/ Mount Pipe	120.0000	0.06	9'7-5/16"	5'6-19/32"	128'	1.473	0	6.21	10.31
DB844G65ZAXY w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32"	128'	1.473	0	9.81	9.84
MG D3-800TV w/ Mount Pipe	0.0000	0.04	0'	-11'1-3/16"	128'	1.473	0	3.57	3.42
MG D3-800TV w/ Mount Pipe	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
MG D3-800TV w/ Mount Pipe	240.0000	0.04	-9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
P65.16.XL.2 w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32"	128'	1.473	0	8.64	5.78
GPS_A	120.0000	0.00	9'7-5/16"	5'6-19/32"	130'	1.480	0	0.30	0.30
RRH2X40-AWS	0.0000	0.04	0'	-11'1-3/16"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	240.0000	0.04	-9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
MG D3-800Tx w/ Mount Pipe	0.0000	0.03	0'	-11'1-3/16"	128'	1.473	0	3.57	3.42
MG D3-800Tx w/ Mount Pipe	120.0000	0.03	9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
MG D3-800Tx w/ Mount Pipe	240.0000	0.03	-9'7-5/16"	5'6-19/32"	128'	1.473	0	3.57	3.42
DB-T1-6Z-8AB-0Z	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	5.60	2.33
Sector Mount [SM 411-3]	0.0000	1.07	0'	0'	126'	1.466	0	21.88	21.88
800 10504 w/ Mount Pipe	0.0000	0.04	0'	-11'10-13/16"	112'	1.418	0	3.59	3.18
800 10504 w/ Mount Pipe	120.0000	0.04	10'3-23/32"	5'11-13/32"	112'	1.418	0	3.59	3.18

tnxTower	Job: BRG 134 943057 (BU# 807133)	Page: 38 of 53
FDH Engineering, Inc. 6521 Meridien Drive, Suite 107 Raleigh, North Carolina Phone: 9197551012 FAX: 9197551031	Project: 1421YV1400	Date: 16:51:03 01/29/14
	Client: Crown Castle	Designed by: Jeffrey B. Ray

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
800 10504 w/ Mount Pipe	240.0000	0.04	-10'3-23/32"	5'11-13/32"	112'	1.418	0	3.59	3.18
Empty Mount Pipe	0.0000	0.03	0'	-11'10-13/16"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	120.0000	0.03	10'3-23/32"	5'11-13/32"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-10'3-23/32"	5'11-13/32"	112'	1.418	0	1.40	1.40
Sector Mount [SM 104-3]	0.0000	0.95	0'	0'	112'	1.418	0	30.02	30.02
7770.00 w/ Mount Pipe	0.0000	0.12	0'	-9'5-17/32"	102'	1.380	0	12.24	8.51
7770.00 w/ Mount Pipe	120.0000	0.12	8'2-13/32"	4'8-3/4"	102'	1.380	0	12.24	8.51
7770.00 w/ Mount Pipe	240.0000	0.12	-8'2-13/32"	4'8-3/4"	102'	1.380	0	12.24	8.51
LGP13519	0.0000	0.01	0'	-9'5-17/32"	102'	1.380	0	0.68	0.41
LGP13519	120.0000	0.01	8'2-13/32"	4'8-3/4"	102'	1.380	0	0.68	0.41
LGP13519	240.0000	0.01	-8'2-13/32"	4'8-3/4"	102'	1.380	0	0.68	0.41
LGP2140X	0.0000	0.02	0'	-9'5-17/32"	102'	1.380	0	2.52	0.76
LGP2140X	120.0000	0.02	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	0.76
LGP2140X	240.0000	0.02	-8'2-13/32"	4'8-3/4"	102'	1.380	0	2.52	0.76
RRUS-11	0.0000	0.12	0'	-9'5-17/32"	102'	1.380	0	5.88	2.49
RRUS-11	120.0000	0.12	8'2-13/32"	4'8-3/4"	102'	1.380	0	5.88	2.49
RRUS-11	240.0000	0.12	-8'2-13/32"	4'8-3/4"	102'	1.380	0	5.88	2.49
P65-16-XLH-RR w/ Mount Pipe	0.0000	0.08	0'	-9'5-17/32"	102'	1.380	0	8.64	6.36
P65-16-XLH-RR w/ Mount Pipe	120.0000	0.08	8'2-13/32"	4'8-3/4"	102'	1.380	0	8.64	6.36
P65-16-XLH-RR w/ Mount Pipe	240.0000	0.08	-8'2-13/32"	4'8-3/4"	102'	1.380	0	8.64	6.36
DC6-48-60-18-8F	120.0000	0.03	8'2-13/32"	4'8-3/4"	102'	1.380	0	2.57	4.32
Empty Mount Pipe	0.0000	0.03	0'	-9'5-17/32"	102'	1.380	0	1.40	1.40
Empty Mount Pipe	120.0000	0.03	8'2-13/32"	4'8-3/4"	102'	1.380	0	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-8'2-13/32"	4'8-3/4"	102'	1.380	0	1.40	1.40
Sector Mount [SM 301-3]	0.0000	1.30	0'	0'	102'	1.380	0	29.61	1.00
GPS_A	120.0000	0.00	12'8-3/4"	7'4-3/16"	30'	1.000	0	0.30	0.30
GPS_A	240.0000	0.00	-12'8-3/4"	7'4-3/16"	30'	1.000	0	0.30	0.30
Side Arm Mount [SO 701-1]	120.0000	0.07	11'10-7/16"	6'10-3/16"	30'	1.000	0	0.85	1.67
Side Arm Mount [SO 701-1]	240.0000	0.07	-11'10-7/16"	6'10-3/16"	30'	1.000	0	0.85	1.67
VG-1060	300.0000	0.00	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.13	0.13
GPS_A	300.0000	0.00	-6'9-27/32"	-3'11-9/32"	12'	1.000	0	0.30	0.30
Pipe Mount [PM 601-1]	300.0000	0.07	-5'11-13/	-3'5-9/32"	12'	1.000	0	3.00	0.90

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
	Sum Weight:	11.52	32"						

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 ksf
157'	VHLP2-18	-10.0000	0.03	0'	-6'2-7/8"	1.561	3.72	0
157'	VHLP2-18	80.0000	0.03	5'4-13/16' '	3'1-7/16"	1.561	3.72	0
135'	VHLP2-23	50.0000	0.03	0'	-7'6-23/32"	1.496	3.72	0
		Sum Weight:	0.09					

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 ksf	t_z in
157'	VHLP2-18	-10.0000	0.07	0'	-6'2-7/8"	1.561	4.24	0	0.9044
157'	VHLP2-18	80.0000	0.07	5'4-13/16' '	3'1-7/16"	1.561	4.24	0	0.9044
135'	VHLP2-23	50.0000	0.07	0'	-7'6-23/32"	1.496	4.24	0	0.8881
		Sum Weight:	0.20						

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 ksf
157'	VHLP2-18	-10.0000	0.03	0'	-6'2-7/8"	1.561	3.72	0
157'	VHLP2-18	80.0000	0.03	5'4-13/16' '	3'1-7/16"	1.561	3.72	0
135'	VHLP2-23	50.0000	0.03	0'	-7'6-23/32"	1.496	3.72	0
		Sum Weight:	0.09					

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	15.06					
Bracing Weight	16.60					
Total Member Self-Weight	31.66			55.82	9.39	
Total Weight	59.57			55.82	9.39	

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
Wind 0 deg - No Ice		0.12	-56.25	-5346.92	-9.35	-27.44
Wind 30 deg - No Ice		27.13	-46.93	-4471.58	-2610.23	0.72
Wind 60 deg - No Ice		46.28	-26.81	-2537.40	-4460.17	26.45
Wind 90 deg - No Ice		54.11	-0.09	42.32	-5206.30	45.83
Wind 120 deg - No Ice		48.65	28.08	2749.34	-4660.62	55.47
Wind 150 deg - No Ice		27.01	46.90	4576.81	-2590.68	45.43
Wind 180 deg - No Ice		-0.13	53.51	5224.27	28.78	25.57
Wind 210 deg - No Ice		-27.18	46.99	4591.24	2636.50	-0.62
Wind 240 deg - No Ice		-48.74	28.24	2775.83	4694.29	-28.10
Wind 270 deg - No Ice		-54.17	0.10	70.58	5233.78	-45.79
Wind 300 deg - No Ice		-46.27	-26.64	-2511.27	4475.58	-51.87
Wind 330 deg - No Ice		-27.01	-46.86	-4459.57	2609.68	-45.61
Member Ice	17.94					
Total Weight Ice	115.73			135.70	44.62	
Wind 0 deg - Ice		0.03	-17.22	-1488.04	39.80	-6.21
Wind 30 deg - Ice		7.93	-13.73	-1177.51	-715.36	1.94
Wind 60 deg - Ice		13.32	-7.71	-606.78	-1236.12	8.42
Wind 90 deg - Ice		15.83	-0.02	132.05	-1468.99	13.25
Wind 120 deg - Ice		14.90	8.60	945.27	-1359.55	16.02
Wind 150 deg - Ice		7.90	13.72	1446.83	-709.90	11.38
Wind 180 deg - Ice		-0.03	15.39	1615.54	49.58	5.26
Wind 210 deg - Ice		-7.95	13.74	1450.69	806.27	-1.92
Wind 240 deg - Ice		-14.92	8.64	952.28	1452.75	-9.82
Wind 270 deg - Ice		-15.85	0.02	139.62	1560.17	-13.24
Wind 300 deg - Ice		-13.32	-7.67	-599.85	1323.97	-13.65
Wind 330 deg - Ice		-7.90	-13.71	-1174.19	799.19	-11.42
Total Weight	59.57			55.82	9.39	
Wind 0 deg - Service		0.04	-19.46	-1869.60	-7.17	-9.49
Wind 30 deg - Service		9.39	-16.24	-1566.71	-907.13	0.25
Wind 60 deg - Service		16.02	-9.28	-897.44	-1547.24	9.15
Wind 90 deg - Service		18.72	-0.03	-4.81	-1805.42	15.86
Wind 120 deg - Service		16.83	9.71	931.88	-1616.60	19.19
Wind 150 deg - Service		9.34	16.23	1564.22	-900.36	15.72
Wind 180 deg - Service		-0.04	18.51	1788.25	6.03	8.85
Wind 210 deg - Service		-9.40	16.26	1569.21	908.35	-0.21
Wind 240 deg - Service		-16.87	9.77	941.04	1620.39	-9.72
Wind 270 deg - Service		-18.74	0.03	4.97	1807.06	-15.84
Wind 300 deg - Service		-16.01	-9.22	-888.40	1544.71	-17.95
Wind 330 deg - Service		-9.34	-16.22	-1562.56	899.07	-15.78

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
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice

Comb. No.	Description
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	4	5.25	0.10	0.01
			Max. Compression	2	-8.01	0.17	0.00
			Max. Mx	8	-0.06	0.77	-0.01
			Max. My	7	-0.98	-0.02	0.76
			Max. Vy	8	0.60	-0.40	-0.01
			Max. Vx	13	-0.58	-0.02	0.38
		Diagonal	Max Tension	9	1.72	0.00	0.00
			Max. Compression	9	-1.76	0.00	0.00
			Max. Mx	24	0.46	0.02	-0.00
			Max. My	19	0.04	0.02	0.00
			Max. Vy	24	0.02	0.02	-0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	8	0.06	0.00	0.00
			Max. Compression	6	-0.08	0.00	0.00
			Max. Mx	14	-0.02	-0.03	0.00
			Max. My	19	-0.02	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Mid Girt	Max Tension	6	0.20	0.00	0.00
			Max. Compression	8	-0.18	0.00	0.00
			Max. Mx	14	0.02	-0.04	0.00
			Max. My	19	-0.01	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T2	160 - 153.333	Leg	Max Tension	4	8.57	-0.18	0.01
			Max. Compression	10	-11.85	0.08	-0.02
			Max. Mx	8	8.43	0.20	-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	9	-1.25	-0.01	-0.23
			Max. Vy	8	-0.15	-0.18	-0.00
			Max. Vx	11	-0.14	-0.00	-0.15
		Diagonal	Max Tension	9	2.20	0.00	0.00
			Max. Compression	9	-2.27	0.00	0.00
			Max. Mx	25	0.48	0.03	0.00
			Max. My	24	-0.28	0.03	-0.00
			Max. Vy	25	0.03	0.03	-0.00
			Max. Vx	24	0.00	0.00	0.00
T3	153.333 - 146.667	Leg	Max Tension	12	12.71	-0.08	0.01
			Max. Compression	10	-16.86	0.28	-0.02
			Max. Mx	4	12.56	-0.29	0.02
			Max. My	13	-1.86	-0.01	0.29
			Max. Vy	4	0.08	-0.29	0.02
			Max. Vx	2	-0.09	-0.15	0.27
		Diagonal	Max Tension	9	2.48	0.00	0.00
			Max. Compression	9	-2.60	0.00	0.00
			Max. Mx	25	0.49	0.03	0.00
			Max. My	23	0.02	0.03	-0.01
			Max. Vy	25	0.03	0.03	-0.00
			Max. Vx	23	0.00	0.00	0.00
		Top Girt	Max Tension	4	0.27	0.00	0.00
			Max. Compression	2	-0.16	0.00	0.00
			Max. Mx	14	0.11	-0.06	0.00
			Max. My	19	0.15	0.00	0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T4	146.667 - 140	Leg	Max Tension	12	17.40	-0.28	0.01
			Max. Compression	10	-22.95	0.56	-0.03
			Max. Mx	4	17.02	-0.61	0.02
			Max. My	13	-2.55	-0.03	0.62
			Max. Vy	4	0.41	-0.61	0.02
			Max. Vx	13	-0.42	-0.03	0.62
		Diagonal	Max Tension	9	3.09	0.00	0.00
			Max. Compression	9	-3.15	0.00	0.00
			Max. Mx	25	0.66	0.04	0.01
			Max. My	23	0.09	0.03	-0.01
			Max. Vy	25	0.03	0.04	-0.01
			Max. Vx	23	0.00	0.00	0.00
		Top Girt	Max Tension	12	0.24	0.00	0.00
			Max. Compression	10	-0.14	0.00	0.00
			Max. Mx	14	0.11	-0.07	0.00
			Max. My	19	0.14	0.00	0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T5	140 - 120	Leg	Max Tension	12	37.79	-0.36	0.03
			Max. Compression	10	-49.59	0.38	0.01
			Max. Mx	4	22.78	-0.61	0.02
			Max. My	13	-2.80	-0.03	0.62
			Max. Vy	4	-1.02	-0.36	-0.00
			Max. Vx	9	0.99	-0.02	0.20
		Diagonal	Max Tension	9	6.28	0.00	0.00
			Max. Compression	9	-6.31	0.00	0.00
			Max. Mx	25	1.36	0.05	0.01
			Max. My	21	-1.40	0.05	-0.01
			Max. Vy	25	0.04	0.05	0.01
			Max. Vx	21	0.00	0.00	0.00
T6	120 - 100	Leg	Max Tension	8	66.34	-0.66	0.01
			Max. Compression	10	-84.25	1.08	0.06
			Max. Mx	4	64.63	-1.12	-0.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	9	-6.39	-0.02	0.88
			Max. Vy	4	0.90	-1.12	-0.06
			Max. Vx	3	0.82	-0.03	-0.77
		Diagonal	Max Tension	3	7.78	0.00	0.00
			Max. Compression	3	-7.81	0.00	0.00
			Max. Mx	23	1.99	0.08	0.01
			Max. My	19	0.20	0.07	-0.01
			Max. Vy	21	0.05	0.08	-0.01
			Max. Vx	19	-0.00	0.00	0.00
T7	100 - 80	Leg	Max Tension	8	95.41	-0.52	-0.04
			Max. Compression	10	-118.64	0.45	0.05
			Max. Mx	4	78.03	-1.12	-0.06
			Max. My	7	-8.68	-0.03	-0.81
			Max. Vy	4	-0.18	-1.12	-0.06
			Max. Vx	6	-0.16	-0.13	-0.60
		Diagonal	Max Tension	5	9.81	0.00	0.00
			Max. Compression	5	-9.79	0.00	0.00
			Max. Mx	21	2.28	0.12	0.02
			Max. My	19	0.15	0.10	-0.02
			Max. Vy	21	0.06	0.12	0.02
			Max. Vx	19	-0.00	0.00	0.00
T8	80 - 70	Leg	Max Tension	8	111.19	-0.52	-0.04
			Max. Compression	10	-136.75	1.81	0.10
			Max. Mx	2	-134.16	1.82	0.12
			Max. My	7	-11.38	0.05	-1.71
			Max. Vy	2	-0.23	1.82	0.12
			Max. Vx	7	0.28	0.05	-1.71
		Diagonal	Max Tension	5	10.19	0.00	0.00
			Max. Compression	5	-10.37	0.00	0.00
			Max. Mx	21	2.01	0.14	-0.02
			Max. My	19	-0.08	0.12	-0.02
			Max. Vy	21	0.06	0.14	0.02
			Max. Vx	19	-0.00	0.00	0.00
T9	70 - 60	Leg	Max Tension	8	126.88	-1.60	-0.11
			Max. Compression	10	-155.28	0.08	-0.00
			Max. Mx	2	-152.26	1.82	0.12
			Max. My	7	-12.13	0.05	-1.71
			Max. Vy	2	0.26	1.82	0.12
			Max. Vx	13	0.29	0.04	1.70
		Diagonal	Max Tension	5	10.98	0.00	0.00
			Max. Compression	5	-11.19	0.00	0.00
			Max. Mx	21	2.32	-0.25	0.03
			Max. My	25	-2.34	-0.21	-0.04
			Max. Vy	21	-0.12	-0.25	-0.03
			Max. Vx	25	0.01	0.00	0.00
T10	60 - 40	Leg	Max Tension	8	157.67	-0.98	-0.05
			Max. Compression	10	-191.70	1.33	0.07
			Max. Mx	17	16.92	-2.47	-0.03
			Max. My	7	-15.05	0.05	-1.12
			Max. Vy	17	0.38	-2.47	-0.03
			Max. Vx	7	0.22	-0.02	-1.11
		Diagonal	Max Tension	5	11.44	0.00	0.00
			Max. Compression	5	-11.77	0.00	0.00
			Max. Mx	21	1.97	0.19	-0.02
			Max. My	19	0.67	0.15	-0.02
			Max. Vy	21	0.08	0.18	0.02
			Max. Vx	19	-0.00	0.00	0.00
T11	40 - 20	Leg	Max Tension	8	187.34	-0.67	-0.02
			Max. Compression	10	-227.66	2.31	0.13
			Max. Mx	17	19.76	-5.89	-0.03
			Max. My	7	-16.52	-0.17	-1.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	17	0.99	-5.89	-0.03
			Max. Vx	7	-0.17	-0.17	-1.16
		Diagonal	Max Tension	5	12.10	0.00	0.00
			Max. Compression	5	-12.45	0.00	0.00
			Max. Mx	21	1.31	0.27	0.03
			Max. My	19	-1.53	0.26	-0.03
			Max. Vy	21	0.10	0.27	0.03
			Max. Vx	19	0.01	0.00	0.00
T12	20 - 0	Leg	Max Tension	8	215.09	-0.92	-0.04
			Max. Compression	10	-263.43	-0.00	-0.00
			Max. Mx	17	26.59	-5.89	-0.03
			Max. My	7	-19.50	-0.23	-2.35
			Max. Vy	17	-1.17	-5.89	-0.03
			Max. Vx	7	-0.36	-0.23	-2.35
		Diagonal	Max Tension	5	13.34	0.00	0.00
			Max. Compression	5	-13.59	0.00	0.00
			Max. Mx	21	-1.34	-0.67	0.06
			Max. My	11	-12.92	-0.23	-0.08
			Max. Vy	21	-0.20	-0.67	0.06
			Max. Vx	24	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	272.33	30.24	-16.68
	Max. H_x	10	272.33	30.24	-16.68
	Max. H_z	3	-188.32	-20.95	14.79
	Min. Vert	4	-217.72	-25.70	14.17
	Min. H_x	4	-217.72	-25.70	14.17
	Min. H_z	10	272.33	30.24	-16.68
Leg B	Max. Vert	6	270.37	-30.46	-16.06
	Max. H_x	12	-217.73	25.96	13.64
	Max. H_z	13	-188.02	21.40	13.85
	Min. Vert	12	-217.73	25.96	13.64
	Min. H_x	6	270.37	-30.46	-16.06
	Min. H_z	6	270.37	-30.46	-16.06
Leg A	Max. Vert	2	267.41	-0.64	34.39
	Max. H_x	11	16.59	3.53	1.66
	Max. H_z	2	267.41	-0.64	34.39
	Min. Vert	8	-222.02	0.59	-29.44
	Min. H_x	5	17.90	-3.54	1.78
	Min. H_z	8	-222.02	0.59	-29.44

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	59.57	0.00	0.00	55.82	9.39	0.00
Dead+Wind 0 deg - No Ice	59.57	0.12	-56.25	-5359.72	-9.33	-27.47
Dead+Wind 30 deg - No Ice	59.57	27.13	-46.93	-4482.31	-2616.48	0.73

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - No Ice	59.57	46.28	-26.81	-2543.47	-4470.86	26.54
Dead+Wind 90 deg - No Ice	59.57	54.11	-0.09	42.44	-5218.77	45.98
Dead+Wind 120 deg - No Ice	59.57	48.65	28.08	2755.94	-4671.74	55.60
Dead+Wind 150 deg - No Ice	59.57	27.01	46.90	4587.76	-2596.84	45.50
Dead+Wind 180 deg - No Ice	59.57	-0.13	53.51	5236.74	28.88	25.60
Dead+Wind 210 deg - No Ice	59.57	-27.18	46.99	4602.20	2642.81	-0.64
Dead+Wind 240 deg - No Ice	59.57	-48.74	28.24	2782.46	4705.51	-28.19
Dead+Wind 270 deg - No Ice	59.57	-54.17	0.10	70.76	5246.32	-45.94
Dead+Wind 300 deg - No Ice	59.57	-46.27	-26.64	-2517.26	4486.34	-52.00
Dead+Wind 330 deg - No Ice	59.57	-27.01	-46.86	-4470.23	2615.99	-45.68
Dead+Ice+Temp	115.73	0.00	-0.00	136.06	44.81	-0.00
Dead+Wind 0 deg+Ice+Temp	115.73	0.03	-17.22	-1494.83	39.98	-6.25
Dead+Wind 30 deg+Ice+Temp	115.73	7.93	-13.73	-1182.99	-718.62	1.95
Dead+Wind 60 deg+Ice+Temp	115.73	13.32	-7.71	-609.68	-1241.76	8.47
Dead+Wind 90 deg+Ice+Temp	115.73	15.83	-0.02	132.52	-1475.67	13.34
Dead+Wind 120 deg+Ice+Temp	115.73	14.90	8.60	949.36	-1365.62	16.12
Dead+Wind 150 deg+Ice+Temp	115.73	7.90	13.72	1453.27	-713.13	11.45
Dead+Wind 180 deg+Ice+Temp	115.73	-0.03	15.39	1622.76	49.80	5.30
Dead+Wind 210 deg+Ice+Temp	115.73	-7.95	13.74	1457.14	809.93	-1.93
Dead+Wind 240 deg+Ice+Temp	115.73	-14.92	8.64	956.44	1459.31	-9.88
Dead+Wind 270 deg+Ice+Temp	115.73	-15.85	0.02	140.12	1567.26	-13.33
Dead+Wind 300 deg+Ice+Temp	115.73	-13.32	-7.67	-602.72	1330.00	-13.74
Dead+Wind 330 deg+Ice+Temp	115.73	-7.90	-13.71	-1179.65	802.82	-11.49
Dead+Wind 0 deg - Service	59.57	0.04	-19.46	-1818.00	2.92	-9.50
Dead+Wind 30 deg - Service	59.57	9.39	-16.24	-1514.40	-899.21	0.25
Dead+Wind 60 deg - Service	59.57	16.02	-9.28	-843.53	-1540.86	9.18
Dead+Wind 90 deg - Service	59.57	18.72	-0.03	51.25	-1799.64	15.91
Dead+Wind 120 deg - Service	59.57	16.83	9.71	990.19	-1610.39	19.24
Dead+Wind 150 deg - Service	59.57	9.34	16.23	1624.04	-892.42	15.74
Dead+Wind 180 deg - Service	59.57	-0.04	18.51	1848.61	16.14	8.86
Dead+Wind 210 deg - Service	59.57	-9.40	16.26	1629.02	920.62	-0.22
Dead+Wind 240 deg - Service	59.57	-16.87	9.77	999.36	1634.36	-9.76
Dead+Wind 270 deg - Service	59.57	-18.74	0.03	61.06	1821.48	-15.90
Dead+Wind 300 deg - Service	59.57	-16.01	-9.22	-834.46	1558.52	-17.99
Dead+Wind 330 deg - Service	59.57	-9.34	-16.22	-1510.23	911.33	-15.80

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-59.57	0.00	0.00	59.57	0.00	0.000%
2	0.12	-59.57	-56.25	-0.12	59.57	56.25	0.000%
3	27.13	-59.57	-46.93	-27.13	59.57	46.93	0.000%
4	46.28	-59.57	-26.81	-46.28	59.57	26.81	0.000%
5	54.11	-59.57	-0.09	-54.11	59.57	0.09	0.000%
6	48.65	-59.57	28.08	-48.65	59.57	-28.08	0.000%
7	27.01	-59.57	46.90	-27.01	59.57	-46.90	0.000%
8	-0.13	-59.57	53.51	0.13	59.57	-53.51	0.000%
9	-27.18	-59.57	46.99	27.18	59.57	-46.99	0.000%
10	-48.74	-59.57	28.24	48.74	59.57	-28.24	0.000%
11	-54.17	-59.57	0.10	54.17	59.57	-0.10	0.000%
12	-46.27	-59.57	-26.64	46.27	59.57	26.64	0.000%
13	-27.01	-59.57	-46.86	27.01	59.57	46.86	0.000%
14	0.00	-115.73	0.00	0.00	115.73	0.00	0.000%
15	0.03	-115.73	-17.22	-0.03	115.73	17.22	0.000%
16	7.93	-115.73	-13.73	-7.93	115.73	13.73	0.000%
17	13.32	-115.73	-7.71	-13.32	115.73	7.71	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
18	15.83	-115.73	-0.02	-15.83	115.73	0.02	0.000%
19	14.90	-115.73	8.60	-14.90	115.73	-8.60	0.000%
20	7.90	-115.73	13.72	-7.90	115.73	-13.72	0.000%
21	-0.03	-115.73	15.39	0.03	115.73	-15.39	0.000%
22	-7.95	-115.73	13.74	7.95	115.73	-13.74	0.000%
23	-14.92	-115.73	8.64	14.92	115.73	-8.64	0.000%
24	-15.85	-115.73	0.02	15.85	115.73	-0.02	0.000%
25	-13.32	-115.73	-7.67	13.32	115.73	7.67	0.000%
26	-7.90	-115.73	-13.71	7.90	115.73	13.71	0.000%
27	0.04	-59.57	-19.46	-0.04	59.57	19.46	0.000%
28	9.39	-59.57	-16.24	-9.39	59.57	16.24	0.000%
29	16.02	-59.57	-9.28	-16.02	59.57	9.28	0.000%
30	18.72	-59.57	-0.03	-18.72	59.57	0.03	0.000%
31	16.83	-59.57	9.71	-16.83	59.57	-9.71	0.000%
32	9.34	-59.57	16.23	-9.34	59.57	-16.23	0.000%
33	-0.04	-59.57	18.51	0.04	59.57	-18.51	0.000%
34	-9.40	-59.57	16.26	9.40	59.57	-16.26	0.000%
35	-16.87	-59.57	9.77	16.87	59.57	-9.77	0.000%
36	-18.74	-59.57	0.03	18.74	59.57	-0.03	0.000%
37	-16.01	-59.57	-9.22	16.01	59.57	9.22	0.000%
38	-9.34	-59.57	-16.22	9.34	59.57	16.22	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001

31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	3.093	35	0.1253	0.0125
T2	160 - 153.333	2.560	35	0.1233	0.0131
T3	153.333 - 146.667	2.385	35	0.1214	0.0131
T4	146.667 - 140	2.213	35	0.1189	0.0131
T5	140 - 120	2.044	35	0.1156	0.0130
T6	120 - 100	1.551	35	0.1051	0.0126
T7	100 - 80	1.106	35	0.0895	0.0112
T8	80 - 70	0.729	35	0.0726	0.0093
T9	70 - 60	0.566	35	0.0642	0.0080
T10	60 - 40	0.431	35	0.0548	0.0072
T11	40 - 20	0.204	35	0.0348	0.0043
T12	20 - 0	0.057	35	0.0181	0.0015

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	Empty Pipe Mount	35	3.039	0.1252	0.0126	Inf
172'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	35	2.879	0.1249	0.0128	680195
157'	VHLP2-18	35	2.481	0.1225	0.0132	234720
143'	800 MHz RRH	35	2.120	0.1171	0.0130	240370
135'	VHLP2-23	35	1.918	0.1132	0.0130	237684
134'	LLPX310R w/ Mount Pipe	35	1.893	0.1127	0.0130	217061
126'	LNX-6514DS-T4M w/ Mount Pipe	35	1.696	0.1086	0.0128	128125
112'	800 10504 w/ Mount Pipe	35	1.366	0.0994	0.0121	79669
102'	(2) 7770.00 w/ Mount Pipe	35	1.147	0.0912	0.0114	64965
30'	GPS_A	35	0.118	0.0263	0.0027	48829
12'	VG-1060	35	0.027	0.0111	0.0008	71079

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	8.837	10	0.3579	0.0361

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T2	160 - 153.333	7.315	10	0.3520	0.0380
T3	153.333 - 146.667	6.816	10	0.3466	0.0380
T4	146.667 - 140	6.325	10	0.3393	0.0377
T5	140 - 120	5.842	10	0.3299	0.0377
T6	120 - 100	4.435	10	0.2999	0.0364
T7	100 - 80	3.163	10	0.2552	0.0325
T8	80 - 70	2.086	10	0.2071	0.0268
T9	70 - 60	1.622	10	0.1831	0.0231
T10	60 - 40	1.234	10	0.1564	0.0209
T11	40 - 20	0.584	10	0.0992	0.0123
T12	20 - 0	0.165	10	0.0518	0.0044

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	Empty Pipe Mount	10	8.684	0.3577	0.0363	387709
172'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10	8.225	0.3567	0.0371	242317
157'	VHLP2-18	10	7.090	0.3498	0.0380	82874
143'	800 MHz RRH	10	6.059	0.3342	0.0376	84687
135'	VHLP2-23	10	5.483	0.3229	0.0376	84308
134'	LLPX310R w/ Mount Pipe	10	5.412	0.3215	0.0375	76882
126'	LNX-6514DS-T4M w/ Mount Pipe	10	4.848	0.3100	0.0370	45100
112'	800 10504 w/ Mount Pipe	10	3.905	0.2836	0.0350	27935
102'	(2) 7770.00 w/ Mount Pipe	10	3.281	0.2601	0.0329	22747
30'	GPS_A	10	0.339	0.0749	0.0079	17076
12'	VG-1060	10	0.078	0.0318	0.0024	24831

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	A325X	0.8750	4	1.31	26.46	0.050	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	1.72	4.55	0.379	1.333	Member Block Shear
		Top Girt	A325X	0.6250	1	0.06	3.04	0.020	1.333	Member Block Shear
		Mid Girt	A325X	0.6250	1	0.20	3.04	0.066	1.333	Member Block Shear
T2	160	Diagonal	A325X	0.6250	1	2.20	6.80	0.323	1.333	Member Bearing
T3	153.333	Diagonal	A325X	0.6250	1	2.48	6.80	0.365	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.27	3.04	0.089	1.333	Member Block Shear
T4	146.667	Leg	A325X	1.0000	4	4.35	34.56	0.126	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	3.09	6.80	0.454	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.24	3.04	0.080	1.333	Member Block Shear
T5	140	Leg	A325X	1.0000	6	6.30	34.56	0.182	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	A325X	0.6250	1	6.28	6.80	0.924	1.333	Member Bearing
T6	120	Leg	A325X	1.0000	6	11.06	34.56	0.320	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	7.78	7.62	1.021	1.333	Member Bearing
T7	100	Leg	A325X	1.0000	8	11.93	34.56	0.345	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.81	9.14	1.073	1.333	Member Bearing
T8	80	Diagonal	A325X	0.7500	1	10.19	9.14	1.115	1.333	Member Bearing
T9	70	Leg	A325X	1.0000	8	15.86	34.56	0.459	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	10.98	12.91	0.850	1.333	Gusset Bearing
T10	60	Leg	A325X	1.0000	8	19.71	34.56	0.570	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.44	9.14	1.251	1.333	Member Bearing
T11	40	Leg	A325X	1.0000	8	23.42	34.56	0.678	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	12.10	11.43	1.059	1.333	Member Bearing
T12	20	Leg	A449	1.0000	10	21.51	31.10	0.692	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	13.34	12.91	1.033	1.333	Gusset Bearing

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 3 EH	20'15/32"	5'1/8"	52.9 K=1.00	23.893	3.0159	-8.01	72.06	0.111
T2	160 - 153.333	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3 K=1.00	23.671	4.4074	-11.85	104.33	0.114
T3	153.333 - 146.667	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3 K=1.00	23.671	4.4074	-16.86	104.33	0.162
T4	146.667 - 140	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3 K=1.00	23.671	4.4074	-22.95	104.33	0.220
T5	140 - 120	ROHN 5 EH	20'15/32"	6'8-5/32"	43.6 K=1.00	25.320	6.1120	-49.59	154.75	0.320
T6	120 - 100	ROHN 6 EHS	20'3/8"	6'8-5/32"	36.0 K=1.00	26.380	6.7133	-84.25	177.09	0.476
T7	100 - 80	ROHN 6 EH	20'15/32"	10'1/4"	54.8 K=1.00	23.589	8.4049	-118.64	198.26	0.598
T8	80 - 70	ROHN 8 EHS	10'1/4"	10'1/4"	41.2 K=1.00	25.667	9.7193	-136.76	249.47	0.548
T9	70 - 60	ROHN 8 EHS	10'1/4"	10'1/4"	41.2 K=1.00	25.667	9.7193	-155.28	249.47	0.622
T10	60 - 40	ROHN 8 EHS	20'3/8"	10'1/4"	41.2 K=1.00	25.667	9.7193	-191.70	249.47	0.768
T11	40 - 20	ROHN 8 EH	20'3/8"	10'1/4"	41.8 K=1.00	25.582	12.7627	-227.66	326.50	0.697
T12	20 - 0	ROHN 8 EH	20'3/8"	10'1/4"	41.8 K=1.00	25.582	12.7627	-263.43	326.50	0.807

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	L2x2x3/16	9'10-5/16'	4'9-15/32'	146.0 K=1.00	7.007	0.7150	-1.69	5.01	0.337
T2	160 - 153.333	L2 1/2x2 1/2x1/4	11'3-15/32"	5'6-1/8"	134.5 K=1.00	8.249	1.1900	-2.27	9.82	0.231
T3	153.333 - 146.667	L2 1/2x2 1/2x1/4	11'10-3/16"	5'9-15/32'	141.5 K=1.00	7.461	1.1900	-2.60	8.88	0.292
T4	146.667 - 140	L2 1/2x2 1/2x1/4	12'5-5/32'	6'31/32"	148.5 K=1.00	6.769	1.1900	-3.15	8.06	0.391
T5	140 - 120	L2 1/2x2 1/2x1/4	14'2-3/4"	6'11-5/32'	169.3 K=1.00	5.207	1.1900	-6.31	6.20	1.018
T6	120 - 100	L3x3x1/4	15'11-7/8'	7'9"	157.1 K=1.00	6.053	1.4400	-7.81	8.72	0.895
T7	100 - 80	L3 1/2x3 1/2x1/4	19'3-1/8"	9'5-3/4"	164.0 K=1.00	5.554	1.6900	-9.79	9.39	1.043
T8	80 - 70	L3 1/2x3 1/2x1/4	20'1-13/16"	9'9-27/32'	169.7 K=1.00	5.184	1.6900	-10.37	8.76	1.183
T9	70 - 60	2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 59.6944 in - 137	21'3/8"	10'3-1/8"	193.5 K=1.00	3.988	3.3800	-11.19	13.48	0.830
T10	60 - 40	L4x4x1/4	22'9-23/32"	11'1-13/16"	168.3 K=1.00	5.274	1.9400	-11.77	10.23	1.150
T11	40 - 20	L4x4x5/16	24'7-7/16'	12'23/32"	182.9 K=1.00	4.463	2.4000	-12.45	10.71	1.162
T12	20 - 0	2L4x4x5/16x3/8 2L 'a' > 74.5105 in - 176	26'5-17/32"	12'11-3/4'	214.9 K=1.00	3.233	4.8000	-13.59	15.52	0.876

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	L2x2x1/8	6'8-9/32"	6'1-29/32'	185.8 K=1.00	4.324	0.4844	-0.08	2.09	0.037
T3	153.333 - 146.667	L2x2x1/8 KL/R > 200 (C) - 46	9'5-13/32'	8'10-3/32'	266.7 K=1.00	2.099	0.4844	-0.16	1.02	0.155
T4	146.667 - 140	L2x2x1/8 KL/R > 200 (C) - 59	10'1-11/16"	9'6-3/8"	287.6 K=1.00	1.805	0.4844	-0.14	0.87	0.165

Mid 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	L2x2x1/8 KL/R > 200 (C) - 7	7'8-5/8"	7'2-9/32"	217.1 K=1.00	3.168	0.4844	-0.18	1.53	0.120

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 3 EH	20'15/32"	5'1/8"	52.9	30.000	3.0159	5.25	90.48	0.058
T2	160 - 153.333	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	30.000	4.4074	8.57	132.22	0.065
T3	153.333 - 146.667	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	30.000	4.4074	12.71	132.22	0.096
T4	146.667 - 140	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	30.000	4.4074	17.40	132.22	0.132
T5	140 - 120	ROHN 5 EH	20'15/32"	6'8-5/32"	43.6	30.000	6.1120	37.79	183.36	0.206
T6	120 - 100	ROHN 6 EHS	20'3/8"	6'8-5/32"	36.0	30.000	6.7133	66.34	201.40	0.329
T7	100 - 80	ROHN 6 EH	20'15/32"	10'1/4"	54.8	30.000	8.4049	95.41	252.15	0.378
T8	80 - 70	ROHN 8 EHS	10'1/4"	10'1/4"	41.2	30.000	9.7193	111.19	291.58	0.381
T9	70 - 60	ROHN 8 EHS	10'1/4"	10'1/4"	41.2	30.000	9.7193	126.88	291.58	0.435
T10	60 - 40	ROHN 8 EHS	20'3/8"	10'1/4"	41.2	30.000	9.7193	157.67	291.58	0.541
T11	40 - 20	ROHN 8 EH	20'3/8"	10'1/4"	41.8	30.000	12.7627	187.34	382.88	0.489
T12	20 - 0	ROHN 8 EH	20'3/8"	10'1/4"	41.8	30.000	12.7627	215.09	382.88	0.562

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	L2x2x3/16	9'5-1/32"	4'6-27/32"	91.3	29.000	0.4308	1.72	12.49	0.138
T2	160 - 153.333	L2 1/2x2 1/2x1/4	11'3-15/32"	5'6-1/8"	87.8	29.000	0.7519	2.20	21.80	0.101
T3	153.333 - 146.667	L2 1/2x2 1/2x1/4	11'10-3/16"	5'9-15/32"	92.2	29.000	0.7519	2.48	21.80	0.114
T4	146.667 - 140	L2 1/2x2 1/2x1/4	12'5-5/32"	6'31/32"	96.7	29.000	0.7519	3.09	21.80	0.142
T5	140 - 120	L2 1/2x2 1/2x1/4	14'2-3/4"	6'11-5/32"	110.0	29.000	0.7519	6.28	21.80	0.288
T6	120 - 100	L3x3x1/4	15'11-7/8"	7'9"	101.5	32.500	0.9394	7.78	30.53	0.255
T7	100 - 80	L3 1/2x3 1/2x1/4	19'3-1/8"	9'5-3/4"	105.9	32.500	1.1034	9.81	35.86	0.274
T8	80 - 70	L3 1/2x3 1/2x1/4	20'1-13/16"	9'9-27/32"	109.6	32.500	1.1034	10.19	35.86	0.284
T9	70 - 60	2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 59.6944 in - 136	21'3/8"	10'3-1/8"	114.4	29.000	2.2069	10.98	64.00	0.172
T10	60 - 40	L4x4x1/4	22'9-23/32"	11'1-13/16"	108.3	32.500	1.2909	11.44	41.96	0.273
T11	40 - 20	L4x4x5/16	24'7-7/16"	12'23/32"	118.0	32.500	1.5949	12.10	51.84	0.233
T12	20 - 0	2L4x4x5/16x3/8 2L 'a' > 74.5105 in - 175	26'5-17/32"	12'11-3/4"	126.9	29.000	3.1898	13.34	92.51	0.144

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	L2x2x1/8	6'8-9/32"	6'1-29/32'	122.6	29.000	0.2930	0.06	8.50	0.007
T3	153.333 - 146.667	L2x2x1/8	9'5-13/32'	8'10-3/32'	173.9	29.000	0.2930	0.27	8.50	0.032
T4	146.667 - 140	L2x2x1/8	10'1-11/16"	9'6-3/8"	187.2	29.000	0.2930	0.24	8.50	0.029

Mid 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	L2x2x1/8	7'8-5/8"	7'2-9/32"	142.4	29.000	0.2930	0.20	8.50	0.024

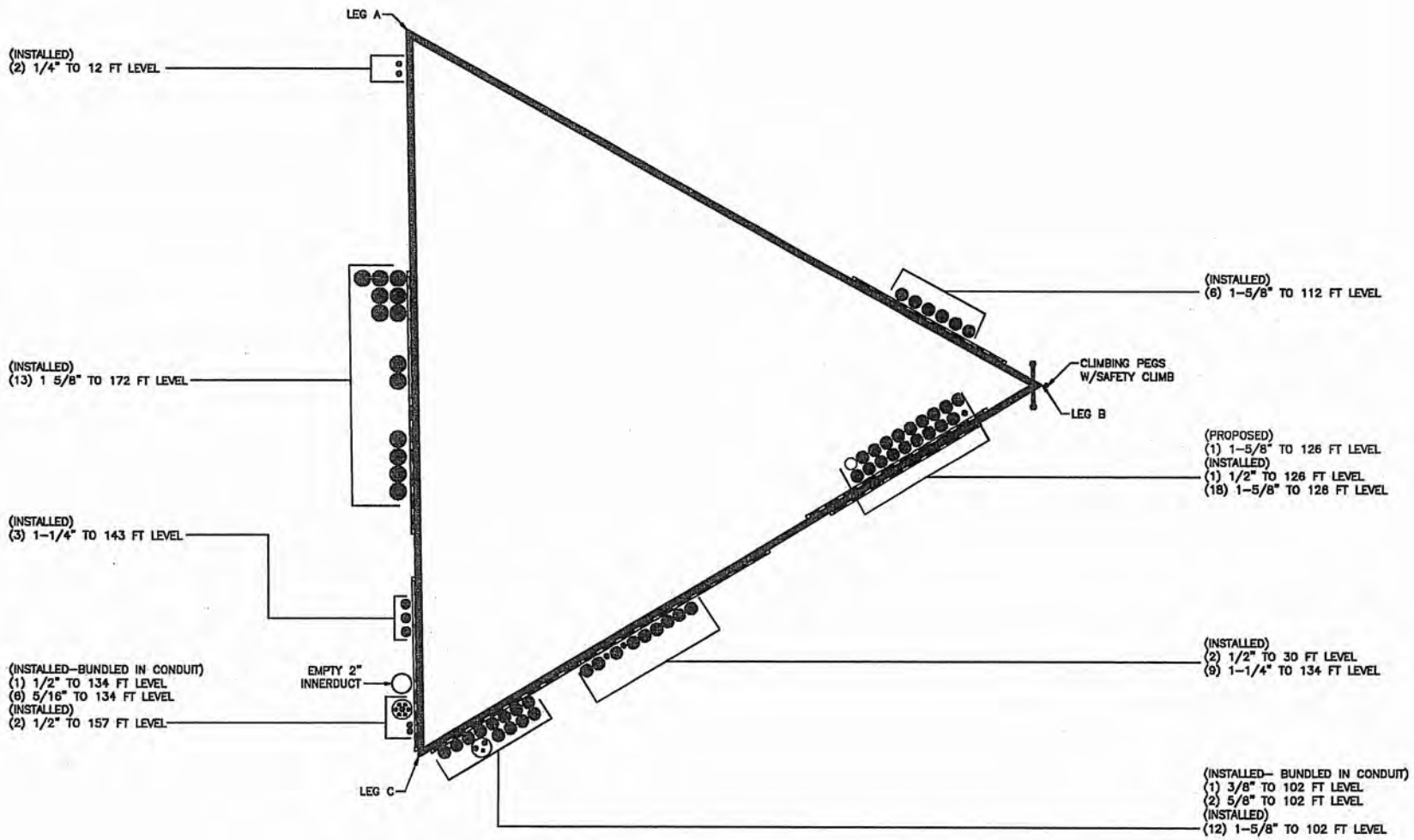
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 3 EH	3	-8.01	96.06	8.3	Pass
T2	160 - 153.333	Leg	ROHN 4 EH	34	-11.85	139.07	8.5	Pass
T3	153.333 - 146.667	Leg	ROHN 4 EH	43	-16.86	139.07	12.1	Pass
T4	146.667 - 140	Leg	ROHN 4 EH	55	-22.95	139.07	16.5	Pass
T5	140 - 120	Leg	ROHN 5 EH	67	-49.59	206.29	24.0	Pass
T6	120 - 100	Leg	ROHN 6 EHS	88	-84.25	236.06	35.7	Pass
T7	100 - 80	Leg	ROHN 6 EH	109	-118.64	264.29	44.9	Pass
T8	80 - 70	Leg	ROHN 8 EHS	124	-136.76	332.54	41.1	Pass
T9	70 - 60	Leg	ROHN 8 EHS	133	-155.28	332.54	46.7	Pass
T10	60 - 40	Leg	ROHN 8 EHS	142	-191.70	332.54	57.6	Pass
T11	40 - 20	Leg	ROHN 8 EH	157	-227.66	435.22	52.3	Pass
T12	20 - 0	Leg	ROHN 8 EH	172	-263.43	435.22	60.5	Pass
T1	180 - 160	Diagonal	L2x2x3/16	15	-1.69	6.68	25.3 28.4 (b)	Pass
T2	160 - 153.333	Diagonal	L2 1/2x2 1/2x1/4	42	-2.27	13.09	17.3 24.2 (b)	Pass
T3	153.333 - 146.667	Diagonal	L2 1/2x2 1/2x1/4	54	-2.60	11.83	21.9 27.4 (b)	Pass
T4	146.667 - 140	Diagonal	L2 1/2x2 1/2x1/4	66	-3.15	10.74	29.3 34.1 (b)	Pass
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	75	-6.31	8.26	76.4	Pass
T6	120 - 100	Diagonal	L3x3x1/4	95	-7.81	11.62	67.2 76.6 (b)	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	113	-9.79	12.51	78.3 80.5 (b)	Pass
T8	80 - 70	Diagonal	L3 1/2x3 1/2x1/4	128	-10.37	11.68	88.8	Pass
T9	70 - 60	Diagonal	2L3 1/2x3 1/2x1/4x3/8	137	-11.19	17.97	62.3 63.8 (b)	Pass
T10	60 - 40	Diagonal	L4x4x1/4	146	-11.77	13.64	86.3 93.9 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T11	40 - 20	Diagonal	L4x4x5/16	161	-12.45	14.28	87.2	Pass
T12	20 - 0	Diagonal	2L4x4x5/16x3/8	176	-13.59	20.68	65.7	Pass
							77.5 (b)	
T1	180 - 160	Top Girt	L2x2x1/8	6	-0.08	2.79	2.8	Pass
T3	153.333 - 146.667	Top Girt	L2x2x1/8	46	-0.16	1.36	11.7	Pass
T4	146.667 - 140	Top Girt	L2x2x1/8	59	-0.14	1.17	12.4	Pass
T1	180 - 160	Mid Girt	L2x2x1/8	7	-0.18	2.05	9.0	Pass
							Summary	
						Leg (T12)	60.5	Pass
						Diagonal (T10)	93.9	Pass
						Top Girt (T4)	12.4	Pass
						Mid Girt (T1)	9.0	Pass
						Bolt Checks	93.9	Pass
						RATING =	**93.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



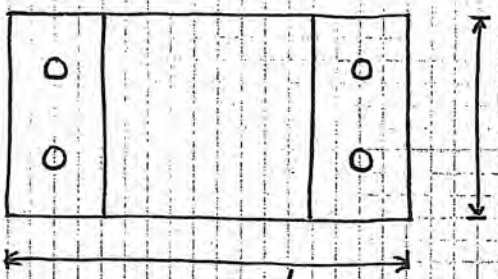
BUSINESS UNIT: 807133 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

FDH

Project: 807133 BRG 134 943057
Sheet ____ of ____ Date: ____
By: ____ FDH Project #: ____
Checked By: ____ Drawing #: ____



TNX Reactions
uplift = 222
Down = 272

$W_c = \{6.25' \cdot 9.75' \cdot 9'\} \cdot 150\ kcf = 82.27\ K$

Compression ultimate Bearing capacity = 30 ksf per Geo

Bearing Area = $6.25' \cdot 9.75' = 60.9375\ ft^2$

total down load = $272\ K + 82.27\ K = 354.27$

Actual Bearing stress = $354.27^{K} / 60.9375\ ft^2 = 5.81\ ksf$

Capacity = $5.81\ ksf / (0.5)(30\ ksf)$

$= 38.8\ \%$

6521 Meridien Drive, Raleigh, NC 27616 (919) 755-1012 Fax: (919) 755-1031 www.fdh-inc.com

FDH

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

Uplift Anchor = #11 BAR A615 Gr 60

Tensile strength of BAR

$$P_N = \frac{F_y A_g}{\Omega} = \frac{(60\ ksi)\ \pi/4 \cdot (1.410)^2}{1.67} = 56.1\ k$$

$P_u = 222\ k/4 = 55.5\ k$

Capacity = 55.5/56.1 = 98.9 %

Soil - Grout interaction

ultimate skin friction = 16.0 ksf

$$\frac{P_N}{\Omega} = \frac{\pi (2.25" \times 1/12") (15.5') (16\ ksf)}{2}$$

$= 73.04\ k$

$P_u = 222\ k/4 = 55.5\ k$

Capacity = 55.5k/73.04k = 76.0 %

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

2122

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

April 21, 2011

Douglas L. Culp, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-103-110330** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 50 Rockland Road, Norwalk, Connecticut.

Dear Mr. Culp:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 30, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Richard Moccia, Mayor, City of Norwalk
Michael Greene, Director of Planning and Zoning, City of Norwalk
Crown Castle USA, Inc.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

April 7, 2011

The Honorable Richard Moccia
Mayor
City of Norwalk
City Hall
125 East Avenue
P. O. Box 5125
Norwalk, CT 06856-5125

RE: **EM-CING-103-110330** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 50 Rockland Road, Norwalk, Connecticut.

Dear Mayor Moccia:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by April 21, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Michael Greene, Director of Planning and Zoning, City of Norwalk

G:\EM\CINGULAR\NORWALK\Moccia5.DOC

CONNECTICUT SITING COUNCIL

EM-CING-103-110330

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

March 30, 2011

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 50 Rockland Road Norwalk, CT (owner Crown Castle)

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications, designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

50 Rockland Road Norwalk, CT
Site Number CT2122
Exempt Mod's: 10/05

Tower Owner/Manager: Crown Castle USA, Inc.

Equipment configuration: SSLT

Current and/or approved:
Six PowerWave antennas @ 100 ft
Six PowerWave TMA's and Diplexer's @ 100 ft
Twelve runs 1 5/8 inch coax to 100 ft
Equipment Shelter

Planned Modifications:
Retain existing PowerWave Diplexers and TMA's at 100 ft
Retain existing PowerWave Antennas @ 100 ft
Retain all Coax Cabling
Install three PowerWave P65-16 antennas or equivalent @ 100 ft
Install six Ericsson RRUS 11 remote radio heads @ 100 ft
Install one RayCap DC6-48-60-18-8F surge protector @ 100 ft
Install one fiber and two DC power cables to 100 ft

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 65.5% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 68.7 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							52.25
AT&T UMTS	107	1900 Band	2	500	0.0314	1.0000	3.14
AT&T UMTS	107	800 Band	1	500	0.0157	0.5867	2.68
AT&T GSM	107	800Band	3	296	0.0279	0.5867	4.75
AT&T GSM	107	1900 Band	2	427	0.0268	1.0000	2.68
Total							**65.5%**

* Data for other users are from Siting Council records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							52.25
AT&T UMTS	107	800 Band	1	500	0.0157	0.5867	2.68
AT&T UMTS	107	1900 Band	2	500	0.0314	1.0000	3.14
AT&T GSM	107	1900 Band	2	427	0.0268	1.0000	2.68
AT&T GSM	107	880 - 894	3	296	0.0279	0.5867	4.75
AT&T LTE	107	740 - 746	1	500	0.0157	0.4933	3.18
Total							**68.7%**

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (Vertical Structures, Inc. dated 3-22-11)

SITE NUMBER: CT2122
SITE NAME: NORWALK - ROCKLAND ROAD

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	50 ROCKLAND ROAD NORWALK, CT 06854
LATITUDE:	41.081381° N 41° 04' 52.97" N
LONGITUDE:	-73.430943° W -73° 25' 51.39" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

DRAWING INDEX

DRAWING INDEX	REV
T-1 TITLE SHEET	1
GN-1 GENERAL NOTES	1
A-1 COMPOUND & EQUIPMENT PLAN	1
A-2 ANTENNA LAYOUT AND ELEVATION	1
A-3 DETAILS	1
G-1 PLUMBING DIAGRAM & DETAILS	1

VICINITY MAP

DIRECTION TO SITE:
START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. MERGE ONTO I-95 S/GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD N.Y. CITY. TAKE THE US-7 EXIT, EXIT 15, TOWARD NORWALK/DANBURY. TAKE THE EXIT TOWARD SOUTH NORWALK/MARITIME AQUARIUM. TURN LEFT ONTO WEST AVE. TURN SLIGHT RIGHT ONTO DR MARTIN LUTHER KING JR DR/MARTIN LUTHER KING DR. CONTINUE TO FOLLOW DR MARTIN LUTHER KING JR DR. TURN RIGHT ONTO ROCKLAND RD. 50 ROCKLAND RD IS ON THE RIGHT.

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455
UNDERGROUND SERVICE ALERT

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2122
SITE NAME: NORWALK - ROCKLAND ROAD
50 ROCKLAND ROAD
NORWALK, CT 06854
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/11	ISSUED FOR CONSTRUCTION	HB	DC	DPH
0	02/10/11	ISSUED FOR REVIEW	DB	DC	DCH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

AT&T
TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2122.01	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION		PROPOSED / NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF.	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ'D	REQUIRED	TYP	TYPICAL

Hudson Design Group LLC
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TEL: (978) 557-1111
FAX: (978) 336-5181

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2122
SITE NAME: NORWALK - ROCKLAND ROAD
50 ROCKLAND ROAD
NORWALK, CT 06854
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/11	ISSUED FOR CONSTRUCTION	MD	DC	TYPP
0	02/10/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 21179 — LICENSED PROFESSIONAL ENGINEER

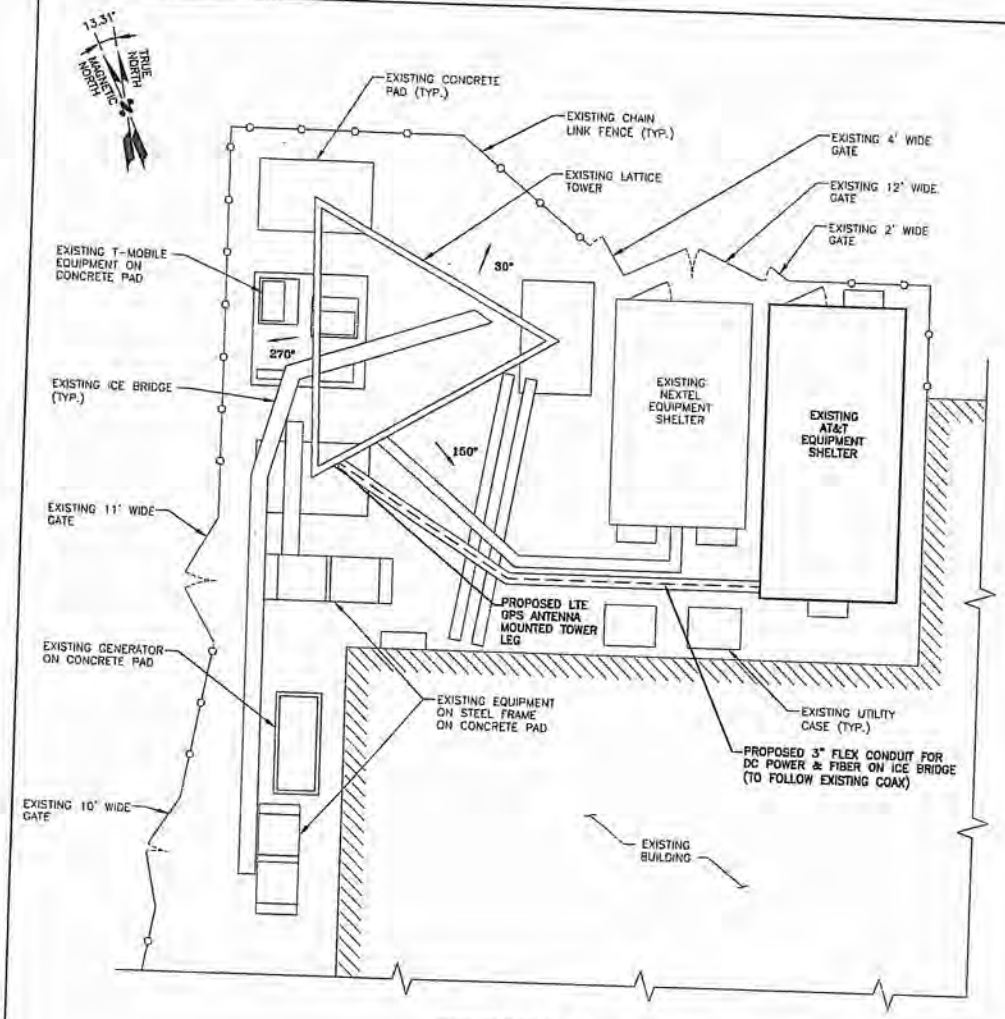
AT&T

GENERAL NOTES (LTE)

JOB NUMBER: 2122.01

DRAWING NUMBER: GN-1

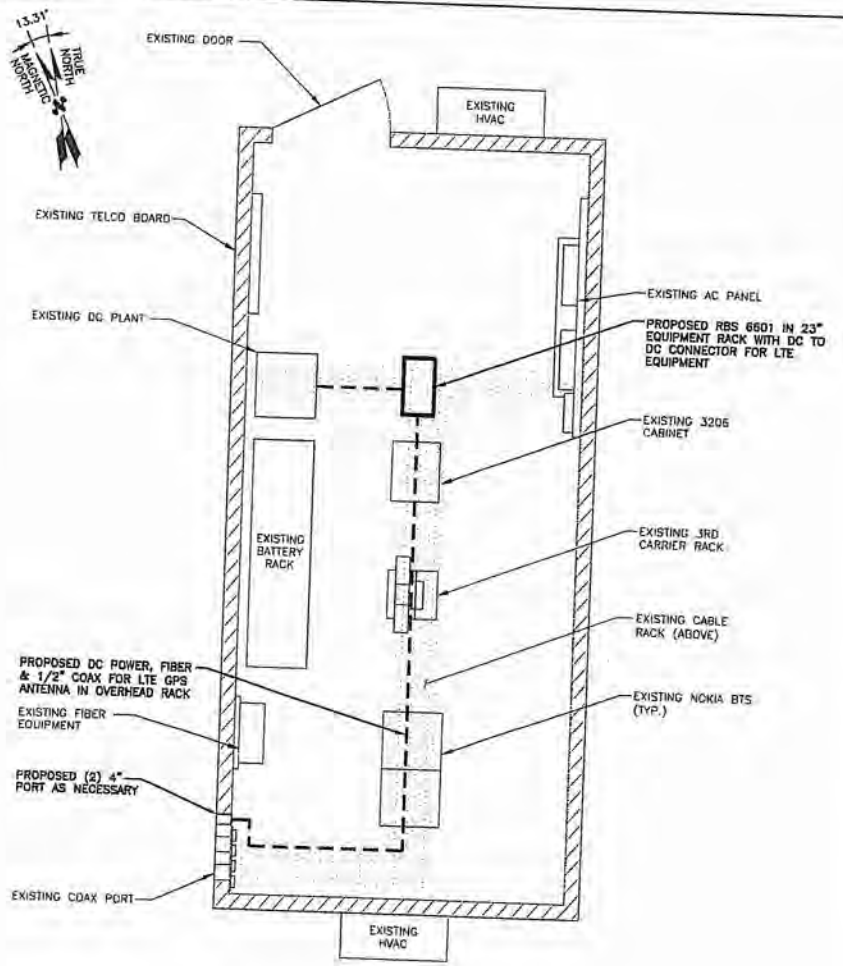
REV: 1



COMPOUND PLAN

SCALE: 3/16"=1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"



EQUIPMENT PLAN

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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SALEM, NH 03079

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NORWALK, CT 06854
FAIRFIELD COUNTY

at&t
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ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	02/10/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 21179
LICENSED PROFESSIONAL ENGINEER

AT&T
COMPOUND & EQUIPMENT PLANS (LTE)

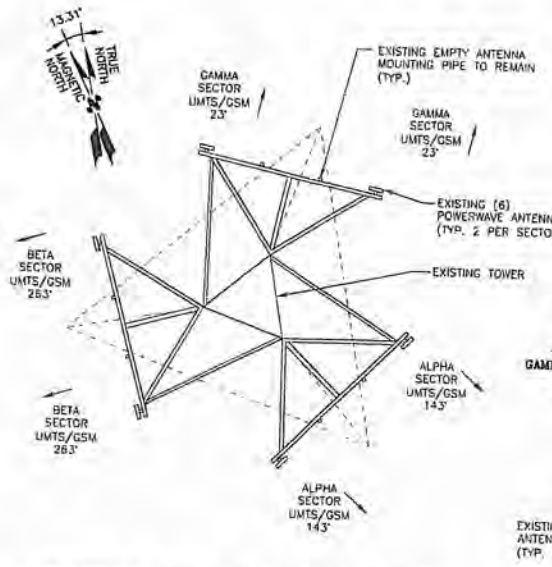
JOB NUMBER	DRAWING NUMBER	REV
2122.01	A-1	1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

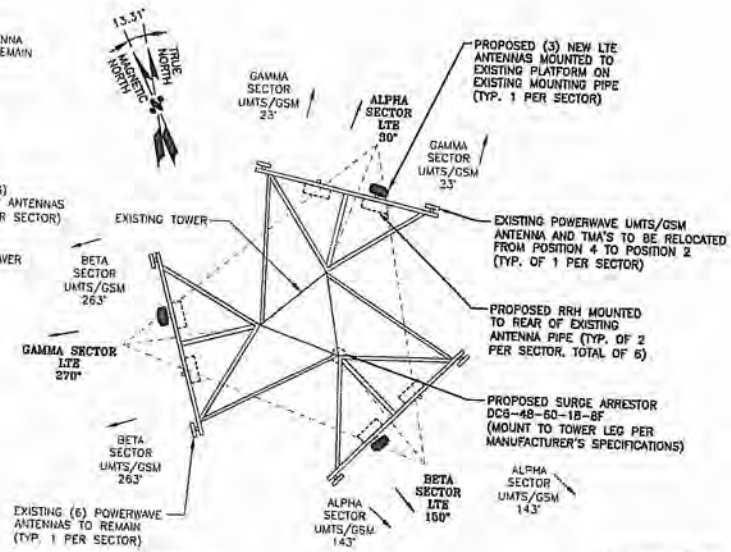
*NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION



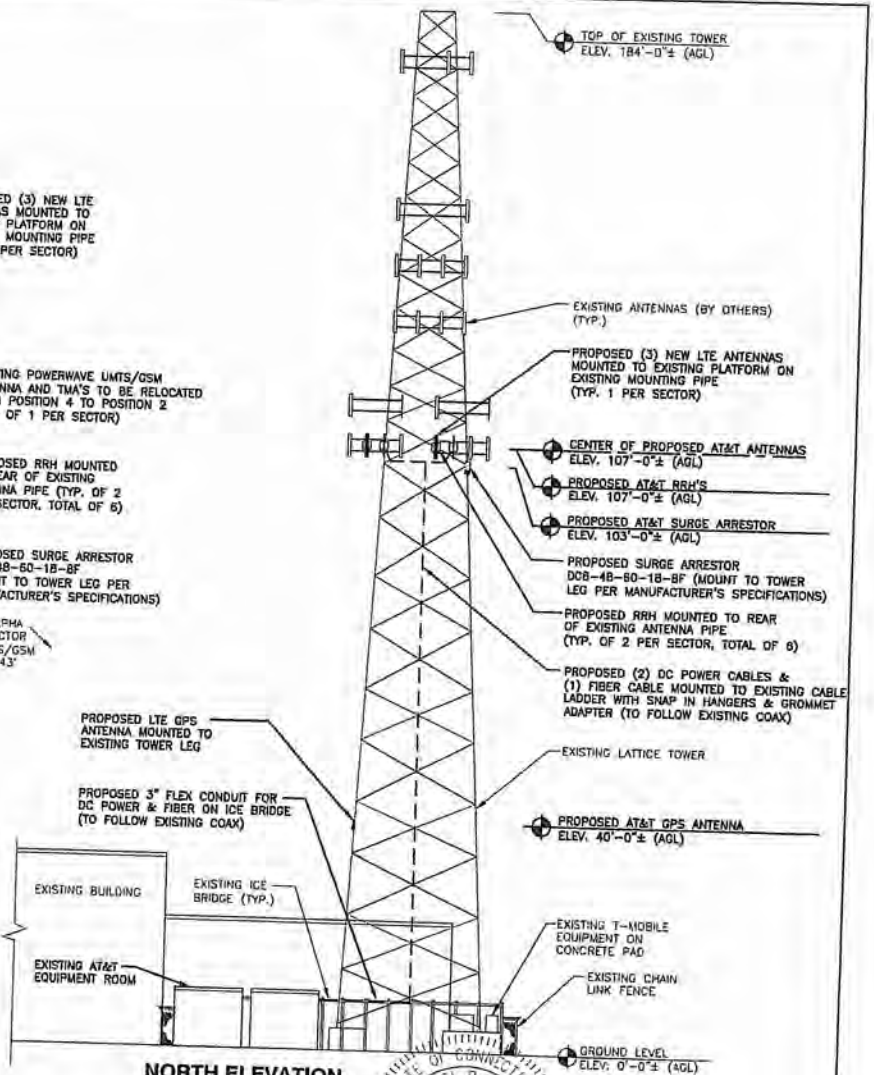
EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

SCALE: 3/32"=1'-0"

Hudson Design Groupe LLC
1400 OSGOOD STREET
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N. ANDOVER, MA 01845
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FAX: (978) 336-5586

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FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/08/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH
0	02/10/11	ISSUED FOR REVIEW	DB	DC	DPH

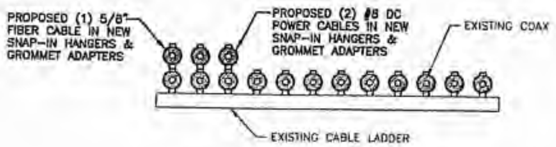
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT DANIEL P. HAMM No. 26178 LICENSED PROFESSIONAL ENGINEER

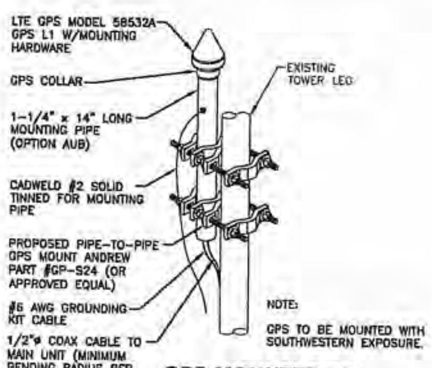
AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2122.01	A-2	1

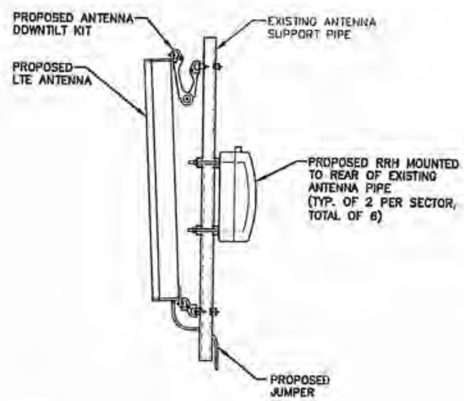


CABLE MOUNTING DETAIL
SCALE: N.T.S.



NOTE:
GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE.

GPS MOUNTED TO TOWER LEG/ICE BRIDGE
SCALE: N.T.S.

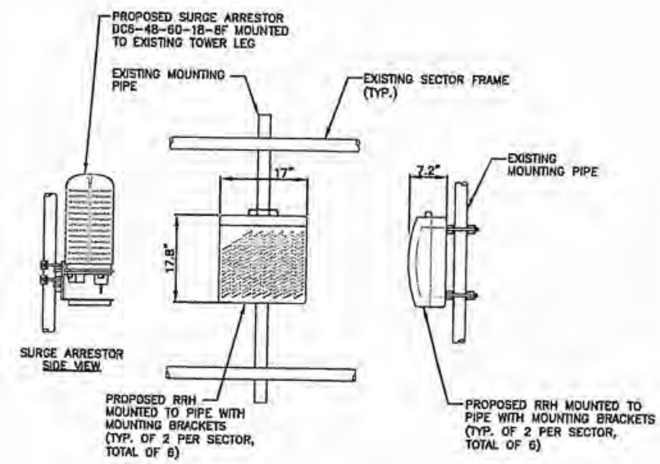


NOTES:

1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

PROPOSED LTE ANTENNA DETAIL
SCALE: 1" = 1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"



PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL
SCALE: N.T.S.

Hudson Design Group LLC

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2122
SITE NAME: NORWALK - ROCKLAND ROAD
50 ROCKLAND ROAD
NORWALK, CT 06854
FAIRFIELD COUNTY

at&t
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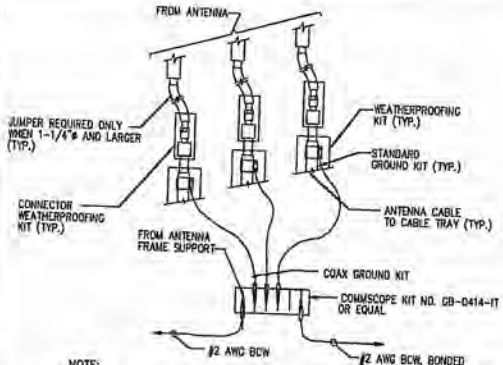
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH
0	02/10/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 24178 — LICENSED PROFESSIONAL ENGINEER

AT&T
DETAILS (LTE)
JOB NUMBER: 2122.01
DRAWING NUMBER: A-3
REV: 1

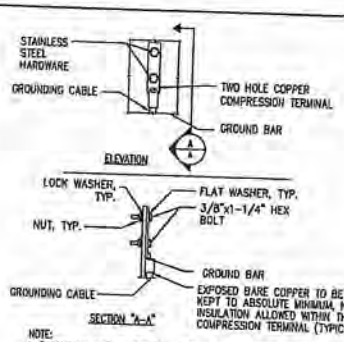


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

1 — N.T.S.

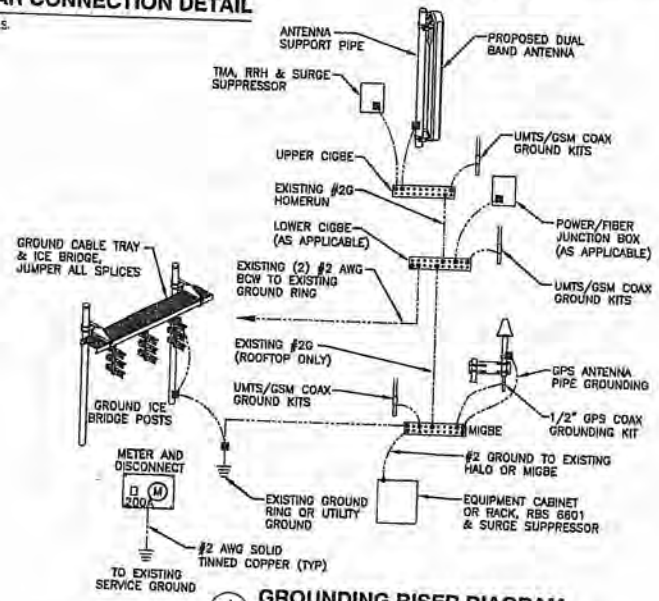


NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

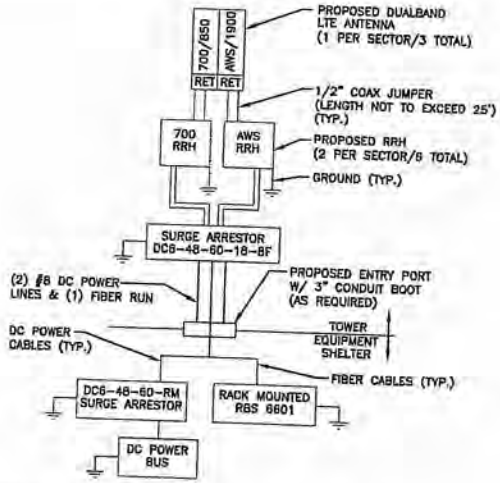
TYPICAL GROUND BAR CONNECTION DETAIL

2 — N.T.S.



GROUNDING RISER DIAGRAM

4 — N.T.S.



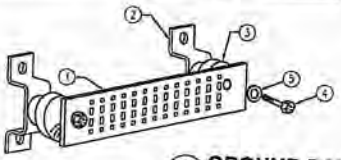
NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

LTE PLUMBING DIAGRAM

3 — N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



GROUND BAR - DETAIL

5 — N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

Hudson Design Group LLC
1600 EDGEWOOD STREET
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SALEM, NH 03079

SITE NUMBER: CT2122
SITE NAME: NORWALK - ROCKLAND ROAD
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NORWALK, CT 06854
FAIRFIELD COUNTY

at&t
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ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/08/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH
0	02/10/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 21179 — LICENSED PROFESSIONAL ENGINEER

AT&T

PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER: 2122.01
DRAWING NUMBER: G-1
REV: 1

Date: **March 22, 2011**

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Boulevard
Mahwah, NJ 07430
(201) 236-9094

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
ncoomes@verticalstructures.com

Subject: **Structural Analysis Report**

Carrier Designation:

***AT&T Mobility* Co-Locate**
Carrier Site Number: 2122
Carrier Site Name: Norwalk-Rockland Road

Crown Castle Designation:

Crown Castle BU Number: 807133
Crown Castle Site Name: BRG 134
Crown Castle JDE Job Number: 151873
Crown Castle Work Order Number: 394285

Engineering Firm Designation:

Vertical Structures, Inc. Project Number: 2011-004-027

Site Data:

50 Rockland Road Norwalk OFC-MTSO,
SO Norwalk, CT, Fairfield County
Latitude *41° 4' 54.44"*, Longitude *-73° 25' 49.52"*
182.354 Foot - Self Support Tower

Dear Veronica Harris,

Vertical Structures, 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 408157, in accordance with application 119126, revision 1.

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:

LC1: 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 local code requirements 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 *Vertical Structures, Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Nathan Coomes, P.E.
Project Engineer

RISA Tower Report - version 5.4.2.0

Date: **March 22, 2011**

Veronica Harris
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(201) 236-9094

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
ncoomes@verticalstructures.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	2122
	Carrier Site Name:	Norwalk-Rockland Road
Crown Castle Designation:	**Crown Castle BU Number:**	807133
	Crown Castle Site Name:	BRG 134
	Crown Castle JDE Job Number:	151873
	Crown Castle Work Order Number:	394285
Engineering Firm Designation:	**Vertical Structures, Inc. Project Number:**	2011-004-027
Site Data:	**50 Rockland Road Norwalk OFC-MTSO, SO Norwalk, CT, Fairfield County**	
	Latitude *41° 4' 54.44"*, Longitude *-73° 25' 49.52"*	
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We at *Vertical Structures, Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Nathan Coomes, P.E.
Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 182.354 ft Self Support tower designed by Rohn in 1987. The tower was originally designed for a wind pressure of 30 psf. The tower has been reworked to accommodate additional loading.

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 and 50 mph under service loads. Also, per Crown Castle's direction and in accordance with ASCE-7-05 we have considered a fastest mile wind speed of 38 mph with an escalating 0.75 inch ice thickness.

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
100	102	6	ericsson	RRUS-11 BTS	2 1	5/8 3/8	
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F Surge Arrestor			

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
178	178	2		Side Arm Mount [SO 305-1]			1
172	173	9	celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	18	1 5/8	1
	172	1		Sector Mount [SM 602-3]			
		3	celwave	ATMAA1412D-1A20 TMA			
		6	siemens	DTMA GSM 1900 TMA			
157	157	2		Side Arm Mount [SO 203-1]			1
		1		Side Arm Mount [SO 203-1]			2
		2	andrew	VHLP2-23	2	1/2	1
		1	andrew	VHLP800-11	1	1/2	2
143	143	1		Side Arm Mount [SO 601-3]	6	1 5/8	1
		3	andrew	UMWD-06516-XD w/Mount Pipe			
		3	communications components	DTMA1819VG12A TMA			2

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134	135	3	argus technologies	LLPX310R w/ Mount Pipe	3 3 1 9	1/4 5/16 1/2 1 1/4	1
		1	andrew	VHLP2-23			
		9	decibel	DB844H90-XY w/Mount Pipe			
		3	samsung telecommunications	FDD_R6_RRH TMA			
	134	1		Sector Mount [SM 506-3]			
128	130	2	andrew	LNX-6514DS-T4M w/Mount Pipe	18	1 5/8	1
		1	powerwave technologies	P65.16.XL.2			
		3	rymsa	MG D3-800TV w/ Mount Pipe			
	128	1		Sector Mount [SM 410-3]			
		4	decibel	DB844G65ZAXY w/Mount Pipe			
		2	decibel	DB844H80E-XY w/Mount Pipe			
113	113	1		Sector Mount [SM 104-3]	6	1 5/8	1
		3	kathrein	800 10504 w/ Mount Pipe			
100	102	6	powerwave technologies	7770.00 w/ mount pipe	12	1 5/8	1
		6	powerwave technologies	LGP13519 Diplexer			
		6	powerwave technologies	LGP2140X TMA			
	100	1		10' Angle Gate (3)			
30	30	2		GPS Antenna	2	1/2	1

Notes:
1) Existing Equipment
2) 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)
217	217	4	celwave	PD10017		
		3	rohn	3' Sidearm		
207	207	6	celwave	PD1132		
		3	rohn	3'-6" Sidearm		
180	180	3		8' Dish		
		3		Pipe Mount		
170	170	1		8' Dish		
		1		Pipe Mount		
156	156	1		8' Dish		
		1		Pipe Mount		
150	150	1		8' Dish		
		1		Pipe Mount		
130	130	1	celwave	PD1109		
		1	rohn	6' Sidearm		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate Revision #1	119126	CCI iSite
Tower Drawing	Rohn Drawing No. C870588	392878	CCI iSite
Tower Information	Vertical Structures Job No. 2008-004-0102	N/A	On File
Foundation Drawing	Paul J. Ford Project No. 31298-49	821566	CCI iSite
Geotechnical Report	FDH Project No. 08-07100E G1	2311843	CCI iSite
Rework Drawings	Vertical Structures Job No. 2004-004-033	1257479	CCI iSite

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

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. Vertical Structures, 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 (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	182.354 - 177.292	Leg	ROHN 3 EH	2	-266.65	72060.70	0.4	Pass
		Diagonal	L2x2x3/16	7	-125.25	9365.82	1.3 1.7 (b)	Pass
		Top Girt	L2x2x1/8	5	-54.89	2581.69	2.1	Pass
T2	177.292 - 172.292	Leg	ROHN 3 EH	14	-642.70	72059.50	0.9	Pass
		Diagonal	L2x2x3/16	16	-419.54	8480.25	4.9	Pass
T3	172.292 - 167.292	Leg	ROHN 3 EH	23	-3755.63	96055.31	3.9	Pass
		Diagonal	L2x2x3/16	28	-1725.37	7682.89	22.5 23.2 (b)	Pass
		Top Girt	L2 1/2x2 1/2x3/16	26	-425.72	5530.83	7.7	Pass
T4	167.292 - 162.208	Leg	ROHN 3 EH	34	-9209.86	96057.31	9.6	Pass
		Diagonal	L2x2x3/16	37	-1930.61	6990.97	27.6	Pass
T5	162.208 - 155.458	Leg	ROHN 4 EH	43	-11729.40	139071.88	8.4	Pass
		Diagonal	L2 1/2x2 1/2x1/4	50	-2391.16	13470.76	17.8 27.8 (b)	Pass
T6	155.458 - 148.792	Leg	ROHN 4 EH	52	-17058.50	139069.22	12.3	Pass
		Diagonal	L2 1/2x2 1/2x1/4	59	-2939.24	12187.90	24.1 34.2 (b)	Pass
		Top Girt	L3x3x3/16	57	678.60	20648.90	3.3 10.1 (b)	Pass
T7	148.792 - 142.021	Leg	ROHN 4 EH	64	-26863.30	139071.88	19.3	Pass
		Diagonal	L2 1/2x2 1/2x1/4	74	-3191.88	11078.72	28.8 37.2 (b)	Pass
		Top Girt	L3x3x3/16	69	-277.00	5609.26	4.9 9.8 (b)	Pass
T8	142.021 - 121.813	Leg	ROHN 5 EH	76	-55437.80	206287.07	26.9	Pass
		Diagonal	L2 1/2x2 1/2x1/4	83	-6509.96	8483.79	76.7	Pass
T9	121.813 - 101.604	Leg	ROHN 6 EHS	97	-90234.70	236066.29	38.2	Pass
		Diagonal	L3x3x1/4	101	-7814.83	11890.11	65.7 91.1 (b)	Pass
T10	101.604 - 81.3333	Leg	ROHN 6 EH	118	-129083.00	264291.23	48.8	Pass
		Diagonal	L3 1/2x3 1/2x1/4	122	-10157.20	12668.82	80.2 83.6 (b)	Pass
T11	81.3333 - 71.1667	Leg	ROHN 8 EHS	133	-137741.00	332544.83	41.4	Pass
		Diagonal	L3 1/2x3 1/2x1/4	137	-10703.10	11760.79	91.0	Pass
T12	71.1667 - 61	Leg	ROHN 8 EHS	142	-167436.00	332544.83	50.4	Pass
		Diagonal	2L4x4x1/4x3/8	146	-11574.00	27169.07	42.6 65.8 (b)	Pass
T13	61 - 40.6667	Leg	ROHN 8 EHS	151	-204576.00	332546.16	61.5	Pass
		Diagonal	L4x4x1/4	155	-12168.10	13779.89	88.3 98.4 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T14	40.6667 - 20.3333	Leg	ROHN 8 EH	166	-241455.00	435225.81	55.5	Pass
		Diagonal	L4x4x5/16	170	-12904.20	14433.59	89.4	Pass
T15	20.3333 - 0	Leg	ROHN 8 EH	181	-277811.00	435225.81	63.8	Pass
		Diagonal	2L4x4x5/16x3/8	185	-13761.40	20880.11	65.9 78.7 (b)	Pass
							Summary	
						Leg (T15)	63.8	Pass
						Diagonal (T13)	98.4	Pass
						Top Girt (T6)	10.1	Pass
						Bolt Checks	98.4	Pass
						Rating =	98.4	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.6	Pass
	Base Foundation (Compared w/ Design Loads)	0	93.3	Pass

Structure Rating (max from all components) =	98.4%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.
2) Capacities up to 105% are considered acceptable based on analysis methods used.

4.1) Recommendations

N/A

APPENDIX A

RISA TOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Side Arm Mount [SO 305-1]	178	P65-16-XL-2 w/ Mount Pipe	128
Side Arm Mount [SO 305-1]	178	MG D3-800TV w/ Mount Pipe (VSI)	128
Sector Mount [SM 602-3]	172	(2) DB844G65ZAXY w/Mount Pipe	128
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	172	Sector Mount [SM 410-3]	128
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	172	LNX-6514DS-T4M w/Mount Pipe	128
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	172	MG D3-800TV w/ Mount Pipe (VSI)	128
ATMAA1412D-1A20 TMA	172	(2) DB844G65ZAXY w/Mount Pipe	128
(2) DTMA GSM 1900 TMA	172	LNX-6514DS-T4M w/Mount Pipe	128
ATMAA1412D-1A20 TMA	172	MG D3-800TV w/ Mount Pipe (VSI)	128
(2) DTMA GSM 1900 TMA	172	(2) DB844H80E-XY w/Mount Pipe	128
ATMAA1412D-1A20 TMA	172	Sector Mount [SM 104-3]	113
(2) DTMA GSM 1900 TMA	172	800 10504 w/ Mount Pipe	113
6' x 2" Mount Pipe	172	6' x 2" Mount Pipe	113
6' x 2" Mount Pipe	172	800 10504 w/ Mount Pipe	113
6' x 2" Mount Pipe	172	6' x 2" Mount Pipe	113
Side Arm Mount [SO 203-1]	157	800 10504 w/ Mount Pipe	113
Side Arm Mount [SO 203-1]	157	6' x 2" Mount Pipe	113
Side Arm Mount [SO 203-1]	157	(2) RRUS-11 BTS (AT&T Mobility)	100
VHLP2-23	157	(2) RRUS-11 BTS (AT&T Mobility)	100
VHLP2-23	157	DC6-48-60-18-8F Surge Arrestor (AT&T Mobility)	100
VHLP800-11	157	5'6"x2" Antenna Mount Pipe (AT&T Mobility)	100
DTMA1819VG12A TMA	143	5'6"x2" Antenna Mount Pipe (AT&T Mobility)	100
Side Arm Mount [SO 601-3]	143	10' Angle Gate (3) (AT&T Mobility)	100
UMWD-05516-XD w/Mount Pipe	143	(2) 7770.00 w/ mount pipe (AT&T Mobility)	100
DTMA1819VG12A TMA	143	(2) LGP13519 Diplexer (AT&T Mobility)	100
UMWD-05516-XD w/Mount Pipe	143	(2) 7770.00 w/ mount pipe (AT&T Mobility)	100
DTMA1819VG12A TMA	143	(2) LGP13519 Diplexer (AT&T Mobility)	100
UMWD-05516-XD w/Mount Pipe	143	(2) LGP21401X (AT&T Mobility)	100
FDD_R8_RRH TMA	134	P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	100
(3) DB844H80-XY w/Mount Pipe	134	P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	100
(3) DB844H80-XY w/Mount Pipe	134	P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	100
(3) DB844H80-XY w/Mount Pipe	134	(2) RRUS-11 BTS (AT&T Mobility)	100
Sector Mount [SM 508-3]	134	(2) LGP21401X (AT&T Mobility)	100
LLPX310R w/ Mount Pipe	134	(2) 7770.00 w/ mount pipe (AT&T Mobility)	100
LLPX310R w/ Mount Pipe	134	(2) LGP13519 Diplexer (AT&T Mobility)	100
LLPX310R w/ Mount Pipe	134	(2) LGP21401X (AT&T Mobility)	100
FDD_R8_RRH TMA	134	GPS/BMR Antenna	30
FDD_R8_RRH TMA	134	GPS/BMR Antenna	30
VHLP2-23	134		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16		

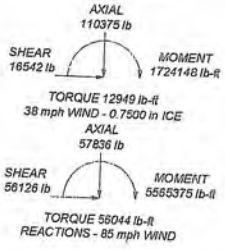
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.4%

MAX. CORNER REACTIONS AT BASE:
DOWN: 276332 lb
UPLIFT: -227022 lb
SHEAR: 34261 lb



Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job	BRG 134, CT BU#807133
Project	Vertical Structures Job No. 2011-004-027
Client: Crown Castle	Drawn by: ncoomes
Code: TIA/EIA-222-F	Date: 03/29/11
Path:	Scale: NTS
	Dwg No. E-1

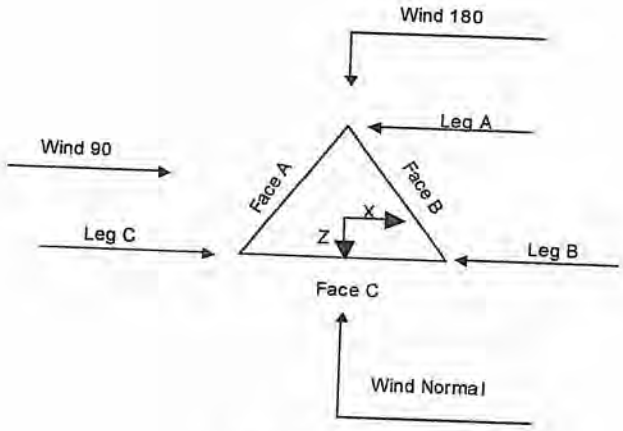
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 182.35 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.69 ft at the top and 25.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
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, feedline 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	182.35-177.29			6.69	1	5.06
T2	177.29-172.29			7.21	1	5.00
T3	172.29-167.29			7.72	1	5.00
T4	167.29-162.21			8.24	1	5.08
T5	162.21-155.46			8.76	1	6.75
T6	155.46-148.79			9.45	1	6.67
T7	148.79-142.02			10.14	1	6.77
T8	142.02-121.81			10.83	1	20.21
T9	121.81-101.60			12.92	1	20.21
T10	101.60-81.33			14.85	1	20.27
T11	81.33-71.17			16.99	1	10.17
T12	71.17-61.00			17.99	1	10.17
T13	61.00-40.67			19.00	1	20.33
T14	40.67-20.33			21.00	1	20.33
T15	20.33-0.00			23.00	1	20.33

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

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	182.35-177.29	5.00	X Brace	No	No	0.7500	0.0000
T2	177.29-172.29	5.00	X Brace	No	No	0.0000	0.0000
T3	172.29-167.29	5.00	X Brace	No	No	0.0000	0.0000
T4	167.29-162.21	5.00	X Brace	No	No	0.0000	1.0000
T5	162.21-155.46	6.67	X Brace	No	No	1.0000	0.0000
T6	155.46-148.79	6.67	X Brace	No	No	0.0000	0.0000
T7	148.79-142.02	6.67	X Brace	No	No	0.0000	1.2500
T8	142.02-121.81	6.67	X Brace	No	No	1.2500	1.2500
T9	121.81-101.60	6.67	X Brace	No	No	1.2500	1.2500
T10	101.60-81.33	10.00	X Brace	No	No	1.2500	2.0000
T11	81.33-71.17	10.00	X Brace	No	No	2.0000	0.0000
T12	71.17-61.00	10.00	X Brace	No	No	0.0000	2.0000
T13	61.00-40.67	10.00	X Brace	No	No	2.0000	2.0000
T14	40.67-20.33	10.00	X Brace	No	No	2.0000	2.0000
T15	20.33-0.00	10.00	X Brace	No	No	2.0000	2.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 182.35-177.29	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 177.29-172.29	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 172.29-167.29	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 167.29-162.21	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T5 162.21-155.46	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 155.46-148.79	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T7 148.79-142.02	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T8 142.02-121.81	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T9 121.81-101.60	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T10 101.60-81.33	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 81.33-71.17	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T12 71.17-61.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Double Equal Angle	2L4x4x1/4x3/8	A36 (36 ksi)
T13 61.00-40.67	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)
T14 40.67-20.33	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T15 20.33-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x5/16x3/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 182.35-177.29	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 172.29-167.29	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 155.46-148.79	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 148.79-142.02	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

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
T1 182.35-177.29	0.44	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 177.29-172.29	0.44	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T3 172.29-167.29	0.44	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T4 167.29-162.21	0.46	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T5 162.21-155.46	0.46	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T6 155.46-148.79	0.46	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T7 148.79-142.02	1.39	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T8 142.02-121.81	1.39	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T9 121.81-101.60	1.04	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T10 101.60-81.33	0.52	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T11 81.33-71.17	0.52	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T12 71.17-61.00	1.04	0.3750	A36 (36 ksi)	1	1	1	122.5200	30.0000
T13 61.00-40.67	1.04	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T14 40.67-20.33	1.04	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T15 20.33-0.00	1.04	0.3750	A36 (36 ksi)	1	1	1	154.9200	30.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 182.35-177.29	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 177.29-172.29	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 172.29-167.29	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 167.29-162.21	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 162.21-155.46	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 155.46-148.79	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 148.79-142.02	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 142.02-121.81	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 121.81-101.60	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 101.60-81.33	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 81.33-71.17	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T12 71.17-61.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T13 61.00-40.67	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T14 40.67-20.33	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T15 20.33-0.00	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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 182.35-177.29	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 177.29-172.29	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 172.29-167.29	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 167.29-162.21	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 162.21-155.46	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 155.46-148.79	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	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
T7 148.79-142.02	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 142.02-121.81	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 121.81-101.60	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 101.60-81.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 81.33-71.17	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 71.17-61.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 61.00-40.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.67-20.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 20.33-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 182.35-177.29	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T2 177.29-172.29	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T3 172.29-167.29	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T4 167.29-162.21	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T5 162.21-155.46	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T6 155.46-148.79	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T7 148.79-142.02	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T8 142.02-121.81	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T9 121.81-101.60	2.5000	5.4063	2.5000	5.4063	0.0000	0.0000	0.0000	0.0000
T10 101.60-81.33	2.5000	5.4063	2.5000	5.4063	0.0000	0.0000	0.0000	0.0000
T11 81.33-71.17	2.5000	6.4063	2.5000	6.4063	0.0000	0.0000	0.0000	0.0000
T12 71.17-61.00	2.5000	6.4063	2.5000	6.4063	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T13 61.00-40.67	2.5000	6.4063	2.5000	6.4063	0.0000	0.0000	0.0000	0.0000
T14 40.67-20.33	2.5000	6.4063	2.5000	6.4063	0.0000	0.0000	0.0000	0.0000
T15 20.33-0.00	2.5000	6.4063	2.5000	6.4063	0.0000	0.0000	0.0000	0.0000

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 182.35-177.29	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 177.29-172.29	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 172.29-167.29	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 167.29-162.21	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 162.21-155.46	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 155.46-148.79	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 148.79-142.02	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 142.02-121.81	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 121.81-101.60	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 101.60-81.33	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 81.33-71.17	Flange	1.0000 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 71.17-61.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 61.00-40.67	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 40.67-20.33	Flange	1.0000 A325N	8	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 20.33-0.00	Flange	1.0000 A354-BC	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	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
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	173.00 - 8.00	2.0000	0	18	12	0.2700	1.9800		0.82
Feedline Ladder (Af)	A	Yes	Af (CfAe)	172.00 - 8.00	1.0000	0	1	1	1.0000 3.0000	0.5000	1.5000	8.40
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	113.00 - 8.00	2.0000	0.35	6	6	1.0000	1.9800		0.82
Feedline Ladder (Af)	B	Yes	Af (CfAe)	182.35 - 8.00	1.0000	0.35	1	1	3.0000	3.0000	12.0000	8.40
LDF7-50A (1-5/8 FOAM)	C	Yes	Ar (CfAe)	130.00 - 8.00	-2.0000	-0.35	18	10	0.2700	1.9800		0.82
Feedline Ladder (Af)	C	Yes	Af (CfAe)	128.00 - 8.00	-1.0000	-0.35	1	1	1.0000 3.0000	3.0000	12.0000	8.40
Feedline Ladder (Af)	C	Yes	Af (CfAe)	120.00 - 8.00	1.0000	-0.35	1	1	3.0000	1.5000	3.5000	8.40
Feedline Ladder (Af)	C	Yes	Af (CfAe)	182.35 - 120.00	1.0000	-0.35	1	1	3.0000	3.0000	12.0000	8.40
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	135.00 - 8.00	2.0000	0.25	9	9	0.7000	1.5500		0.66
CR 50 1873 (1-5/8 FOAM) (A&T Mobility)	C	Yes	Ar (CfAe)	102.00 - 8.00	2.0000	0.35	12	8	0.2700 1.0000	1.9800		0.83
FB-L98-002-XXX (3/8") (A&T Mobility)	C	Yes	Ar (CfAe)	102.00 - 8.00	2.0000	0.35	1	1	0.3937	0.0000		0.10
WR-VG86ST-BRD (Power Cable) (A&T Mobility)	C	Yes	Ar (CfAe)	102.00 - 8.00	2.0000	0.35	2	2	0.7760	0.0000		0.15
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	30.00 - 8.00	0.5000	0.3	2	2	1.6300	0.6300		0.15
Feedline Ladder (Af)	C	Yes	Af (CfAe)	100.00 - 8.00	1.0000	0.3	1	1	3.0000	0.5000	1.5000	8.40
Feedline Ladder (Af)	C	Yes	Af (CfAe)	135.00 - 100.00	1.0000	0.3	1	1	3.0000	1.5000	3.5000	8.40
HJ7-50A (1-5/8 AIR)	A	Yes	Ar (CfAe)	143.00 - 8.00	2.0000	-0.35	6	6	0.2700	1.9800		1.04
Feedline Ladder (Af)	A	Yes	Af (CfAe)	143.00 - 8.00	1.0000	-0.35	1	1	3.0000	3.0000	12.0000	8.40
3" Rigid Conduit	A	Yes	Ar (CfAe)	135.00 - 8.00	2.0000	-0.4	2	2	1.0000	3.0000		3.00
860 10012 (5/16" FOAM)	A	Yes	Ar (CfAe)	135.00 - 8.00	2.0000	-0.4	3	2	0.0000	0.0000		0.06
LDF1-50A (1/4 FOAM)	A	Yes	Ar (CfAe)	135.00 - 8.00	2.0000	-0.4	3	2	0.0000	0.0000		0.06
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	135.00 - 8.00	2.0000	-0.45	4	2	1.0000	0.6300		0.15
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	157.00 - 135.00	2.0000	-0.45	3	2	1.0000	0.6300		0.15

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 lb

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 lb
T1	182.35-177.29	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	1.266	0.000	0.000	42.52
		C	0.000	1.266	0.000	0.000	42.52
T2	177.29-172.29	A	1.402	0.000	0.000	0.000	10.45
		B	0.000	1.250	0.000	0.000	42.00
		C	0.000	1.250	0.000	0.000	42.00
T3	172.29-167.29	A	9.900	0.196	0.000	0.000	113.35
		B	0.000	1.250	0.000	0.000	42.00
		C	0.000	1.250	0.000	0.000	42.00
T4	167.29-162.21	A	10.065	0.212	0.000	0.000	117.73
		B	0.000	1.271	0.000	0.000	42.70
		C	0.000	1.271	0.000	0.000	42.70
T5	162.21-155.46	A	13.527	0.281	0.000	0.000	157.02
		B	0.000	1.688	0.000	0.000	56.70
		C	0.000	1.688	0.000	0.000	56.70
T6	155.46-148.79	A	13.900	0.278	0.000	0.000	157.40
		B	0.000	1.667	0.000	0.000	56.00
		C	0.000	1.667	0.000	0.000	56.00
T7	148.79-142.02	A	15.087	0.527	0.000	0.000	174.19
		B	0.000	1.693	0.000	0.000	56.87
		C	0.000	1.693	0.000	0.000	56.87
T8	142.02-121.81	A	68.734	5.894	0.000	0.000	858.82
		B	0.000	5.052	0.000	0.000	169.75
		C	28.840	8.247	0.000	0.000	531.68
T9	121.81-101.60	A	72.245	5.894	0.000	0.000	904.52
		B	11.282	5.052	0.000	0.000	225.82
		C	57.358	10.331	0.000	0.000	931.66
T10	101.60-81.33	A	72.468	5.912	0.000	0.000	907.32
		B	20.068	5.068	0.000	0.000	270.01
		C	83.769	8.580	0.000	0.000	1140.44
T11	81.33-71.17	A	36.346	2.965	0.000	0.000	455.06
		B	10.065	2.542	0.000	0.000	135.42
		C	42.014	4.236	0.000	0.000	571.98
T12	71.17-61.00	A	36.346	2.965	0.000	0.000	455.06
		B	10.065	2.542	0.000	0.000	135.42
		C	42.014	4.236	0.000	0.000	571.98
T13	61.00-40.67	A	72.692	5.931	0.000	0.000	910.12
		B	20.130	5.083	0.000	0.000	270.84
		C	84.027	8.472	0.000	0.000	1143.95
T14	40.67-20.33	A	72.692	5.931	0.000	0.000	910.12
		B	20.130	5.083	0.000	0.000	270.84
		C	85.042	8.472	0.000	0.000	1146.85
T15	20.33-0.00	A	44.092	3.597	0.000	0.000	552.04
		B	12.210	3.083	0.000	0.000	164.28
		C	52.263	5.139	0.000	0.000	697.57

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 lb
T1	182.35-177.29	A	0.919	0.000	0.000	0.000	0.000	0.00
		B		0.000	1.783	0.000	0.000	70.54
		C		0.000	1.783	0.000	0.000	70.54
T2	177.29-172.29	A	0.916	0.225	1.461	0.000	0.000	39.47
		B		0.000	1.759	0.000	0.000	69.55
		C		0.000	1.759	0.000	0.000	69.55
T3	172.29-167.29	A	0.913	1.586	10.986	0.000	0.000	326.02

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 lb
		B		0.000	1.757	0.000	0.000	69.44
		C		0.000	1.757	0.000	0.000	69.44
T4	167.29-162.21	A	0.910	1.609	11.210	0.000	0.000	333.98
		B		0.000	1.785	0.000	0.000	70.47
		C		0.000	1.785	0.000	0.000	70.47
T5	162.21-155.46	A	0.906	2.446	15.092	0.000	0.000	450.21
		B		0.000	2.367	0.000	0.000	93.38
		C		0.000	2.367	0.000	0.000	93.38
T6	155.46-148.79	A	0.901	3.452	15.601	0.000	0.000	468.67
		B		0.000	2.334	0.000	0.000	92.00
		C		0.000	2.334	0.000	0.000	92.00
T7	148.79-142.02	A	0.896	3.803	17.101	0.000	0.000	507.83
		B		0.000	2.367	0.000	0.000	93.19
		C		0.000	2.367	0.000	0.000	93.19
T8	142.02-121.81	A	0.886	25.816	77.637	0.000	0.000	2327.92
		B		0.000	7.041	0.000	0.000	276.61
		C		6.210	45.740	0.000	0.000	1298.04
T9	121.81-101.60	A	0.868	30.326	79.899	0.000	0.000	2432.54
		B		3.529	21.151	0.000	0.000	541.71
		C		12.030	81.138	0.000	0.000	2354.32
T10	101.60-81.33	A	0.848	30.003	80.053	0.000	0.000	2411.78
		B		6.208	32.146	0.000	0.000	741.30
		C		23.626	106.837	0.000	0.000	3100.53
T11	81.33-71.17	A	0.829	14.862	40.109	0.000	0.000	1197.06
		B		3.083	16.102	0.000	0.000	367.48
		C		11.694	53.454	0.000	0.000	1540.07
T12	71.17-61.00	A	0.815	14.718	40.077	0.000	0.000	1187.43
		B		3.059	16.086	0.000	0.000	364.16
		C		11.575	53.406	0.000	0.000	1528.97
T13	61.00-40.67	A	0.790	28.922	80.039	0.000	0.000	2340.61
		B		6.032	32.115	0.000	0.000	716.51
		C		22.721	106.641	0.000	0.000	3018.45
T14	40.67-20.33	A	0.750	28.111	79.859	0.000	0.000	2287.04
		B		5.897	32.025	0.000	0.000	697.98
		C		25.476	106.370	0.000	0.000	2983.96
T15	20.33-0.00	A	0.750	17.051	48.439	0.000	0.000	1387.22
		B		3.577	19.425	0.000	0.000	423.37
		C		17.750	64.520	0.000	0.000	1828.25

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	182.35-177.29	A	0.000	0.000	0.000	0.000
		B	0.000	0.214	0.144	0.233
		C	0.000	0.214	0.144	0.233
T2	177.29-172.29	A	0.000	0.124	0.113	0.135
		B	0.000	0.148	0.100	0.162
		C	0.000	0.148	0.100	0.162
T3	172.29-167.29	A	0.000	1.310	1.215	1.541
		B	0.000	0.206	0.150	0.242
		C	0.000	0.206	0.150	0.242
T4	167.29-162.21	A	0.000	0.905	0.782	0.995
		B	0.000	0.141	0.097	0.155
		C	0.000	0.141	0.097	0.155
T5	162.21-155.46	A	0.000	0.991	1.056	1.367

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	0.000	0.150	0.129	0.207
T6	155.46-148.79	C	0.000	0.150	0.129	0.207
		A	0.000	1.493	1.603	2.192
		B	0.000	0.205	0.188	0.302
T7	148.79-142.02	C	0.000	0.205	0.188	0.302
		A	0.000	1.583	1.715	2.339
		B	0.000	0.201	0.186	0.297
T8	142.02-121.81	C	0.000	0.201	0.186	0.297
		A	0.000	5.303	5.298	7.485
		B	0.000	0.404	0.359	0.570
T9	121.81-101.60	C	0.000	2.711	2.633	3.826
		A	0.000	5.348	6.436	9.240
		B	0.000	1.223	1.345	2.113
T10	101.60-81.33	C	0.000	4.581	5.575	7.915
		A	0.000	3.687	5.329	7.613
		B	0.000	1.295	1.709	2.673
T11	81.33-71.17	C	0.000	4.391	6.279	9.065
		A	0.000	1.751	2.598	3.694
		B	0.000	0.615	0.833	1.299
T12	71.17-61.00	C	0.000	2.084	3.056	4.398
		A	0.000	1.693	2.931	4.154
		B	0.000	0.596	0.940	1.462
T13	61.00-40.67	C	0.000	2.016	3.448	4.947
		A	0.000	3.207	5.765	8.120
		B	0.000	1.131	1.849	2.863
T14	40.67-20.33	C	0.000	3.824	6.783	9.682
		A	0.000	2.962	5.664	7.900
		B	0.000	1.047	1.816	2.793
T15	20.33-0.00	C	0.000	3.630	6.737	9.681
		A	0.000	1.772	3.388	4.726
		B	0.000	0.626	1.086	1.671
		C	0.000	2.233	4.078	5.954

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	182.35-177.29	3.1381	1.8118	2.2373	1.2917
T2	177.29-172.29	2.1308	1.2302	1.9840	1.1455
T3	172.29-167.29	-4.6620	-2.6916	-2.3661	-1.3661
T4	167.29-162.21	-5.7945	-3.3455	-3.1892	-1.8413
T5	162.21-155.46	-5.7692	-3.1410	-3.4050	-1.8411
T6	155.46-148.79	-5.5757	-2.5034	-3.0522	-1.3857
T7	148.79-142.02	-6.8303	-2.1900	-3.8406	-1.1972
T8	142.02-121.81	-13.0935	6.7157	-8.3446	5.1760
T9	121.81-101.60	-6.9704	11.6885	-3.7408	9.0431
T10	101.60-81.33	-10.1366	17.4449	-6.2348	13.8870
T11	81.33-71.17	-10.2820	17.8166	-6.4666	14.4560
T12	71.17-61.00	-10.4008	18.0816	-6.5624	14.7596
T13	61.00-40.67	-11.0445	19.2836	-7.0356	15.8344
T14	40.67-20.33	-12.0466	20.9723	-8.1271	17.6264
T15	20.33-0.00	-9.6515	16.7232	-6.8607	14.3947

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0.00 0.00	0.0000	178.00	No Ice	0.94	1.41	30.00
						1/2" Ice	1.48	2.17	43.27
						1" Ice	2.02	2.93	56.54
						2" Ice	3.10	4.45	83.07
						4" Ice	5.26	7.49	136.14
Side Arm Mount [SO 305-1]	C	From Leg	1.50 0.00 0.00	0.0000	178.00	No Ice	0.94	1.41	30.00
						1/2" Ice	1.48	2.17	43.27
						1" Ice	2.02	2.93	56.54
						2" Ice	3.10	4.45	83.07
						4" Ice	5.26	7.49	136.14
** Sector Mount [SM 602-3]	C	None		0.0000	172.00	No Ice	33.11	33.11	1540.50
						1/2" Ice	44.90	44.90	2158.77
						1" Ice	56.69	56.69	2777.04
						2" Ice	80.27	80.27	4013.58
						4" Ice	127.43	127.43	6486.66
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	A	From Leg	5.00 -1.00 1.00	-10.0000	172.00	No Ice	7.07	3.43	61.50
						1/2" Ice	7.64	4.25	106.30
						1" Ice	8.18	4.95	160.90
						2" Ice	9.29	6.40	291.72
						4" Ice	11.64	9.51	670.63
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	B	From Leg	4.75 -1.50 1.00	-20.0000	172.00	No Ice	7.07	3.43	61.50
						1/2" Ice	7.64	4.25	106.30
						1" Ice	8.18	4.95	160.90
						2" Ice	9.29	6.40	291.72
						4" Ice	11.64	9.51	670.63
(3) APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	C	From Leg	5.00 -1.00 1.00	-10.0000	172.00	No Ice	7.07	3.43	61.50
						1/2" Ice	7.64	4.25	106.30
						1" Ice	8.18	4.95	160.90
						2" Ice	9.29	6.40	291.72
						4" Ice	11.64	9.51	670.63
ATMAA1412D-1A20 TMA	A	From Leg	5.00 -1.00 0.00	-10.0000	172.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
(2) DTMA GSM 1900 TMA	A	From Leg	5.00 -1.00 0.00	-10.0000	172.00	No Ice	0.83	0.39	11.20
						1/2" Ice	0.96	0.50	16.67
						1" Ice	1.10	0.62	23.82
						2" Ice	1.41	0.89	43.89
						4" Ice	2.13	1.52	112.65
ATMAA1412D-1A20 TMA	B	From Leg	4.75 -1.50 0.00	-20.0000	172.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
(2) DTMA GSM 1900 TMA	B	From Leg	4.75 -1.50 0.00	-20.0000	172.00	No Ice	0.83	0.39	11.20
						1/2" Ice	0.96	0.50	16.67
						1" Ice	1.10	0.62	23.82
						2" Ice	1.41	0.89	43.89
						4" Ice	2.13	1.52	112.65
ATMAA1412D-1A20 TMA	C	From Leg	5.00	-10.0000	172.00	No Ice	1.17	0.47	13.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
			-1.00 0.00			1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
(2) DTMA GSM 1900 TMA	C	From Leg	5.00 -1.00 0.00	-10.0000	172.00	4" Ice	2.58	1.57	137.44
						No Ice	0.83	0.39	11.20
						1/2" Ice	0.96	0.50	16.67
						1" Ice	1.10	0.62	23.82
						2" Ice	1.41	0.89	43.89
6' x 2" Mount Pipe	A	From Leg	5.00 -1.00 0.00	0.0000	172.00	4" Ice	2.13	1.52	112.65
						No Ice	1.43	1.43	22.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	B	From Leg	4.75 -1.50 0.00	0.0000	172.00	4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	22.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	C	From Leg	5.00 -1.00 0.00	0.0000	172.00	4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	22.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
**						4" Ice	4.70	4.70	230.84
Side Arm Mount [SO 601-3]	A	None		0.0000	143.00	No Ice	8.46	8.46	476.10
						1/2" Ice	11.77	11.77	589.56
						1" Ice	15.08	15.08	703.02
						2" Ice	21.70	21.70	929.94
UMWD-06516-XD w/Mount Pipe	A	From Leg	1.95 2.25 0.00	50.0000	143.00	4" Ice	34.94	34.94	1383.78
						No Ice	4.27	3.90	38.75
						1/2" Ice	4.88	4.96	75.51
						1" Ice	5.41	5.73	122.56
						2" Ice	6.56	7.32	238.28
DTMA1819VG12A TMA	A	From Leg	1.95 2.25 0.00	50.0000	143.00	4" Ice	9.02	10.72	590.48
						No Ice	0.81	0.30	12.60
						1/2" Ice	0.94	0.39	17.78
						1" Ice	1.07	0.49	24.54
						2" Ice	1.36	0.72	43.58
UMWD-06516-XD w/Mount Pipe	B	From Leg	1.95 2.25 0.00	50.0000	143.00	4" Ice	2.05	1.28	109.20
						No Ice	4.27	3.90	38.75
						1/2" Ice	4.88	4.96	75.51
						1" Ice	5.41	5.73	122.56
						2" Ice	6.56	7.32	238.28
DTMA1819VG12A TMA	B	From Leg	1.95 2.25 0.00	50.0000	143.00	4" Ice	9.02	10.72	590.48
						No Ice	0.81	0.30	12.60
						1/2" Ice	0.94	0.39	17.78
						1" Ice	1.07	0.49	24.54
						2" Ice	1.36	0.72	43.58
UMWD-06516-XD w/Mount Pipe	A	From Leg	1.05 -2.85 0.00	-70.0000	143.00	4" Ice	2.05	1.28	109.20
						No Ice	4.27	3.90	38.75
						1/2" Ice	4.88	4.96	75.51
						1" Ice	5.41	5.73	122.56
						2" Ice	6.56	7.32	238.28
DTMA1819VG12A TMA	A	From Leg	1.05 -2.85	-70.0000	143.00	4" Ice	9.02	10.72	590.48
						No Ice	0.81	0.30	12.60
						1/2" Ice	0.94	0.39	17.78

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
				0.00						
							1" Ice	1.07	0.49	24.54
							2" Ice	1.36	0.72	43.58
							4" Ice	2.05	1.28	109.20
** Sector Mount [SM 506-3]	B	None			0.0000	134.00	No Ice	35.47	35.47	1742.40
							1/2" Ice	50.60	50.60	2347.80
							1" Ice	65.73	65.73	2953.20
							2" Ice	95.99	95.99	4164.00
							4" Ice	156.51	156.51	6585.60
LLPX310R w/ Mount Pipe	A	From Leg	3.25		50.0000	134.00	No Ice	5.43	3.38	50.56
			3.75				1/2" Ice	5.99	4.15	89.99
			1.00				1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
LLPX310R w/ Mount Pipe	B	From Leg	3.25		50.0000	134.00	No Ice	5.43	3.38	50.56
			3.75				1/2" Ice	5.99	4.15	89.99
			1.00				1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
LLPX310R w/ Mount Pipe	C	From Leg	3.25		50.0000	134.00	No Ice	5.43	3.38	50.56
			3.75				1/2" Ice	5.99	4.15	89.99
			1.00				1" Ice	6.51	4.80	138.53
							2" Ice	7.57	6.19	255.15
							4" Ice	9.86	9.25	597.35
FDD_R6_RRH TMA	A	From Leg	3.25		50.0000	134.00	No Ice	1.79	0.78	33.00
			3.75				1/2" Ice	1.97	0.92	44.50
			1.00				1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
FDD_R6_RRH TMA	B	From Leg	3.25		50.0000	134.00	No Ice	1.79	0.78	33.00
			3.75				1/2" Ice	1.97	0.92	44.50
			1.00				1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
FDD_R6_RRH TMA	C	From Leg	3.25		50.0000	134.00	No Ice	1.79	0.78	33.00
			3.75				1/2" Ice	1.97	0.92	44.50
			1.00				1" Ice	2.16	1.07	58.31
							2" Ice	2.57	1.39	93.60
							4" Ice	3.49	2.14	200.35
(3) DB844H90-XY w/Mount Pipe	A	From Leg	3.25		50.0000	134.00	No Ice	3.58	5.63	35.55
			3.75				1/2" Ice	4.20	6.73	77.48
			1.00				1" Ice	4.73	7.54	129.56
							2" Ice	5.86	9.21	254.87
							4" Ice	8.27	12.75	624.47
(3) DB844H90-XY w/Mount Pipe	B	From Leg	3.25		50.0000	134.00	No Ice	3.58	5.63	35.55
			3.75				1/2" Ice	4.20	6.73	77.48
			1.00				1" Ice	4.73	7.54	129.56
							2" Ice	5.86	9.21	254.87
							4" Ice	8.27	12.75	624.47
(3) DB844H90-XY w/Mount Pipe	C	From Leg	3.25		50.0000	134.00	No Ice	3.58	5.63	35.55
			3.75				1/2" Ice	4.20	6.73	77.48
			1.00				1" Ice	4.73	7.54	129.56
							2" Ice	5.86	9.21	254.87
							4" Ice	8.27	12.75	624.47
** Sector Mount [SM 410-3]	B	None			0.0000	128.00	No Ice	23.96	23.96	1100.47
							1/2" Ice	34.06	34.06	1599.78

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 lb
LNX-6514DS-T4M w/Mount Pipe	A	From Leg	3.25 3.75 2.00	50.0000	128.00	1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	44.16 64.36 104.76 8.63 9.29 9.90 11.17 13.82	44.16 64.36 104.76 7.07 8.25 9.15 10.98 15.01	2099.09 3097.71 5094.95 63.55 129.72 207.93 391.18 899.38
MG D3-800TV w/ Mount Pipe (VSI)	A	From Leg	3.25 3.75 2.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.71 4.19 4.63 5.65 7.82	3.56 4.39 5.09 6.54 9.69	39.50 72.47 114.81 219.81 541.92
(2) DB844G65ZAXY w/Mount Pipe	A	From Leg	3.25 3.75 0.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.38 6.07 6.65 7.83 10.34	5.40 6.49 7.30 8.96 12.49	41.55 89.98 148.78 288.22 688.80
LNX-6514DS-T4M w/Mount Pipe	B	From Leg	3.25 3.75 2.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.63 9.29 9.90 11.17 13.82	7.07 8.25 9.15 10.98 15.01	63.55 129.72 207.93 391.18 899.38
MG D3-800TV w/ Mount Pipe (VSI)	B	From Leg	3.25 3.75 2.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.71 4.19 4.63 5.65 7.82	3.56 4.39 5.09 6.54 9.69	39.50 72.47 114.81 219.81 541.92
(2) DB844H80E-XY w/Mount Pipe	B	From Leg	3.25 3.75 0.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.58 4.20 4.73 5.86 8.27	5.63 6.73 7.54 9.21 12.75	35.55 77.48 129.56 254.87 624.47
P65.16.XL.2 w/ Mount Pipe	C	From Leg	3.25 3.75 2.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.02 7.29 8.41 10.32 14.36	62.20 124.60 199.63 376.85 877.75
MG D3-800TV w/ Mount Pipe (VSI)	C	From Leg	3.25 3.75 2.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.71 4.19 4.63 5.65 7.82	3.56 4.39 5.09 6.54 9.69	39.50 72.47 114.81 219.81 541.92
(2) DB844G65ZAXY w/Mount Pipe	C	From Leg	3.25 3.75 0.00	50.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.38 6.07 6.65 7.83 10.34	5.40 6.49 7.30 8.96 12.49	41.55 89.98 148.78 288.22 688.80
** 10' Angle Gate (3) (AT&T Mobility)	B	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.88 22.50 28.13 39.38 61.88	16.88 22.50 28.13 39.38 61.88	525.00 750.00 975.00 1425.00 2325.00
(2) 7770.00 w/ mount pipe (AT&T Mobility)	A	From Leg	0.75 0.00 2.00	43.0000	100.00	No Ice 1/2" Ice 1" Ice	6.22 6.77 7.30	4.35 5.20 5.92	56.90 102.99 159.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) LGP13519 Diplexer (AT&T Mobility)	A	From Leg	0.75	0.00	43.0000	100.00	2" Ice	8.38	7.41	293.01
							4" Ice	10.69	10.76	679.74
				2.00			No Ice	0.27	0.18	5.50
							1/2" Ice	0.34	0.25	7.92
							1" Ice	0.43	0.32	11.41
(2) LGP2140X (AT&T Mobility)	A	From Leg	0.75	0.00	43.0000	100.00	2" Ice	0.62	0.49	22.43
							4" Ice	1.10	0.94	66.02
				2.00			No Ice	1.23	0.37	17.50
							1/2" Ice	1.38	0.48	24.46
							1" Ice	1.54	0.60	33.28
(2) 7770.00 w/ mount pipe (AT&T Mobility)	B	From Leg	0.75	0.00	43.0000	100.00	2" Ice	1.89	0.87	57.28
							4" Ice	2.69	1.51	136.16
				2.00			No Ice	6.22	4.35	56.90
							1/2" Ice	6.77	5.20	102.99
							1" Ice	7.30	5.92	159.01
(2) LGP13519 Diplexer (AT&T Mobility)	B	From Leg	0.75	0.00	43.0000	100.00	2" Ice	8.38	7.41	293.01
							4" Ice	10.69	10.76	679.74
				2.00			No Ice	0.27	0.18	5.50
							1/2" Ice	0.34	0.25	7.92
							1" Ice	0.43	0.32	11.41
(2) LGP2140X (AT&T Mobility)	B	From Leg	0.75	0.00	43.0000	100.00	2" Ice	0.62	0.49	22.43
							4" Ice	1.10	0.94	66.02
				2.00			No Ice	1.23	0.37	17.50
							1/2" Ice	1.38	0.48	24.46
							1" Ice	1.54	0.60	33.28
(2) 7770.00 w/ mount pipe (AT&T Mobility)	C	From Leg	0.75	0.00	43.0000	100.00	2" Ice	1.89	0.87	57.28
							4" Ice	2.69	1.51	136.16
				2.00			No Ice	6.22	4.35	56.90
							1/2" Ice	6.77	5.20	102.99
							1" Ice	7.30	5.92	159.01
(2) LGP13519 Diplexer (AT&T Mobility)	C	From Leg	0.75	0.00	43.0000	100.00	2" Ice	8.38	7.41	293.01
							4" Ice	10.69	10.76	679.74
				2.00			No Ice	0.27	0.18	5.50
							1/2" Ice	0.34	0.25	7.92
							1" Ice	0.43	0.32	11.41
(2) LGP2140X (AT&T Mobility)	C	From Leg	0.75	0.00	43.0000	100.00	2" Ice	0.62	0.49	22.43
							4" Ice	1.10	0.94	66.02
				2.00			No Ice	1.23	0.37	17.50
							1/2" Ice	1.38	0.48	24.46
							1" Ice	1.54	0.60	33.28
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	A	From Leg	0.75	0.00	50.0000	100.00	2" Ice	1.89	0.87	57.28
							4" Ice	2.69	1.51	136.16
				2.00			No Ice	8.88	6.60	82.20
							1/2" Ice	9.63	7.88	147.36
							1" Ice	10.36	9.00	225.21
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	B	From Leg	0.75	0.00	50.0000	100.00	2" Ice	11.75	10.93	408.26
							4" Ice	14.66	15.02	921.60
				2.00			No Ice	8.88	6.60	82.20
							1/2" Ice	9.63	7.88	147.36
							1" Ice	10.36	9.00	225.21
P65-16-XLH-RR w/ Mount Pipe (AT&T Mobility)	C	From Leg	0.75	0.00	50.0000	100.00	2" Ice	11.75	10.93	408.26
							4" Ice	14.66	15.02	921.60
				2.00			No Ice	8.88	6.60	82.20
							1/2" Ice	9.63	7.88	147.36
							1" Ice	10.36	9.00	225.21
							2" Ice	11.75	10.93	408.26
							4" Ice	14.66	15.02	921.60

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 lb
(2) RRUS-11 BTS (AT&T Mobility)	A	From Leg	0.75 0.00 2.00	50.0000	100.00	No Ice	4.42	1.19	55.00
						1/2" Ice	4.71	1.35	80.77
						1" Ice	5.00	1.53	109.98
						2" Ice	5.61	1.90	179.45
						4" Ice	6.94	2.75	368.09
(2) RRUS-11 BTS (AT&T Mobility)	B	From Leg	0.75 0.00 2.00	50.0000	100.00	No Ice	4.42	1.19	55.00
						1/2" Ice	4.71	1.35	80.77
						1" Ice	5.00	1.53	109.98
						2" Ice	5.61	1.90	179.45
						4" Ice	6.94	2.75	368.09
(2) RRUS-11 BTS (AT&T Mobility)	C	From Leg	0.75 0.00 2.00	50.0000	100.00	No Ice	4.42	1.19	55.00
						1/2" Ice	4.71	1.35	80.77
						1" Ice	5.00	1.53	109.98
						2" Ice	5.61	1.90	179.45
						4" Ice	6.94	2.75	368.09
DC6-48-60-18-8F Surge Arrestor (AT&T Mobility)	B	From Leg	0.75 0.00 2.00	50.0000	100.00	No Ice	2.22	2.22	20.00
						1/2" Ice	2.44	2.44	39.25
						1" Ice	2.66	2.66	61.47
						2" Ice	3.15	3.15	115.61
						4" Ice	4.21	4.21	268.16
5'6"x2" Antenna Mount Pipe (AT&T Mobility)	A	From Leg	0.75 0.00 2.00	0.0000	100.00	No Ice	1.31	1.31	20.00
						1/2" Ice	1.70	1.70	29.95
						1" Ice	2.04	2.04	43.65
						2" Ice	2.75	2.75	82.93
						4" Ice	4.28	4.28	213.27
5'6"x2" Antenna Mount Pipe (AT&T Mobility)	B	From Leg	0.75 0.00 2.00	0.0000	100.00	No Ice	1.31	1.31	20.00
						1/2" Ice	1.70	1.70	29.95
						1" Ice	2.04	2.04	43.65
						2" Ice	2.75	2.75	82.93
						4" Ice	4.28	4.28	213.27
5'6"x2" Antenna Mount Pipe (AT&T Mobility)	C	From Leg	0.75 0.00 2.00	0.0000	100.00	No Ice	1.31	1.31	20.00
						1/2" Ice	1.70	1.70	29.95
						1" Ice	2.04	2.04	43.65
						2" Ice	2.75	2.75	82.93
						4" Ice	4.28	4.28	213.27
** GPS/BMR Antenna	B	From Leg	0.50 -2.00 0.00	-90.0000	30.00	No Ice	2.00	2.00	50.00
						1/2" Ice	2.80	2.80	70.00
						1" Ice	3.60	3.60	90.00
						2" Ice	5.20	5.20	130.00
						4" Ice	8.40	8.40	210.00
GPS/BMR Antenna	C	From Leg	0.50 2.00 0.00	90.0000	30.00	No Ice	2.00	2.00	50.00
						1/2" Ice	2.80	2.80	70.00
						1" Ice	3.60	3.60	90.00
						2" Ice	5.20	5.20	130.00
						4" Ice	8.40	8.40	210.00
** Side Arm Mount [SO 203-1]	A	From Leg	1.50 0.00 0.00	0.0000	157.00	No Ice	2.96	3.36	125.00
						1/2" Ice	4.10	4.68	153.55
						1" Ice	5.24	6.00	182.10
						2" Ice	7.52	8.64	239.19
						4" Ice	12.08	13.92	353.38
Side Arm Mount [SO 203-1]	B	From Leg	1.50 0.00 0.00	0.0000	157.00	No Ice	2.96	3.36	125.00
						1/2" Ice	4.10	4.68	153.55
						1" Ice	5.24	6.00	182.10
						2" Ice	7.52	8.64	239.19
						4" Ice	12.08	13.92	353.38

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 lb
Side Arm Mount [SO 203-1]	C	From Leg	1.50 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.96 4.10 5.24 7.52 12.08	3.36 4.68 6.00 8.64 13.92	125.00 153.55 182.10 239.19 353.38
** Sector Mount [SM 104-3]	C	None		0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	30.02 40.48 50.94 71.86 113.70	30.02 40.48 50.94 71.86 113.70	952.50 1404.60 1856.70 2760.90 4569.30
800 10504 w/ Mount Pipe	A	From Leg	3.83 -3.21 0.00	-40.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.47 3.84 4.23 5.08 6.99	3.05 3.68 4.33 5.67 8.61	35.85 65.14 103.05 198.43 494.74
6' x 2" Mount Pipe	A	From Leg	3.83 -3.21 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84
800 10504 w/ Mount Pipe	B	From Leg	3.83 -3.21 0.00	-40.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.47 3.84 4.23 5.08 6.99	3.05 3.68 4.33 5.67 8.61	35.85 65.14 103.05 198.43 494.74
6' x 2" Mount Pipe	B	From Leg	3.83 -3.21 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84
800 10504 w/ Mount Pipe	C	From Leg	3.83 -3.21 0.00	-40.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.47 3.84 4.23 5.08 6.99	3.05 3.68 4.33 5.67 8.61	35.85 65.14 103.05 198.43 494.74
6' x 2" Mount Pipe	C	From Leg	3.83 -3.21 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84

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 lb
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00	-35.0000		157.00	2.17	No Ice 1/2" Ice	3.72 4.01	31.00 51.56

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft 0.00	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight lb
									1" Ice	4.30	72.12
									2" Ice	4.88	113.24
									4" Ice	6.04	195.48
VHLP2-23	B	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	-75.0000		157.00	2.17	No Ice	3.72	31.00
									1/2" Ice	4.01	51.56
									1" Ice	4.30	72.12
									2" Ice	4.88	113.24
									4" Ice	6.04	195.48
VHLP800-11	C	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	68.0000		157.00	2.92	No Ice	6.68	47.60
									1/2" Ice	7.07	83.90
									1" Ice	7.46	120.20
									2" Ice	8.23	192.80
									4" Ice	9.78	338.00
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	3.25 3.75 1.00	50.0000		134.00	2.17	No Ice	3.72	31.00
									1/2" Ice	4.01	51.56
									1" Ice	4.30	72.12
									2" Ice	4.88	113.24
									4" Ice	6.04	195.48

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	182.354	Diagonal	A325N	0.6250	1	123.73	5437.50	0.023 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	54.89	5437.50	0.010 ✓	1.333	Member Bearing
T2	177.292	Diagonal	A325N	0.6250	1	419.54	6442.72	0.065 ✓	1.333	Bolt Shear
T3	172.292	Diagonal	A325N	0.6250	1	1679.76	5437.50	0.309 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	419.18	5437.50	0.077 ✓	1.333	Member Bearing
T4	167.292	Leg	A325N	0.8750	4	1528.32	26426.70	0.058 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	1950.27	5437.50	0.359 ✓	1.333	Member Bearing
T5	162.208	Diagonal	A325N	0.6250	1	2391.16	6442.72	0.371 ✓	1.333	Bolt Shear
T6	155.458	Diagonal	A325N	0.6250	1	2939.24	6442.72	0.456 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	734.68	5437.50	0.135 ✓	1.333	Member Bearing
T7	148.792	Leg	A325N	1.0000	4	5111.25	34490.20	0.148 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	3191.88	6442.72	0.495 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	707.72	5437.50	0.130 ✓	1.333	Member Bearing
T8	142.021	Leg	A325N	1.0000	6	7092.92	34440.00	0.206 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6509.96	6442.72	1.010 ✓	1.333	Bolt Shear
T9	121.813	Leg	A325N	1.0000	6	12035.70	34375.70	0.350 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7822.80	6442.72	1.214 ✓	1.333	Bolt Shear
T10	101.604	Leg	A325N	1.0000	8	13144.60	34415.40	0.382 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	10191.10	9140.63	1.115 ✓	1.333	Member Bearing
T11	81.3333	Diagonal	A325N	0.7500	1	10703.10	9277.52	1.154 ✓	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T12	71.1667	Leg	A325N	1.0000	8	17208.10	34379.70	0.501	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	11332.40	12914.10	0.878	1.333	Gusset Bearing
T13	61	Leg	A325N	1.0000	8	21160.00	34348.80	0.616	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	12168.10	9277.52	1.312	1.333	Bolt Shear
T14	40.6667	Leg	A325N	1.0000	8	24959.90	34320.20	0.727	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	12904.20	13253.60	0.974	1.333	Bolt Shear
T15	20.3333	Diagonal	A325N	0.7500	1	13553.70	12914.10	1.050	1.333	Gusset Bearing

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	182.354 - 177.292	ROHN 3 EH	5.07	5.01	52.9 K=1.00	23.893	3.0159	-266.65	72060.70	0.004
T2	177.292 - 172.292	ROHN 3 EH	5.01	5.01	52.9 K=1.00	23.893	3.0159	-642.70	72059.50	0.009
T3	172.292 - 167.292	ROHN 3 EH	5.01	5.01	52.9 K=1.00	23.893	3.0159	-3755.63	72059.50	0.052
T4	167.292 - 162.208	ROHN 3 EH	5.09	5.01	52.9 K=1.00	23.894	3.0159	-9209.86	72061.00	0.128
T5	162.208 - 155.458	ROHN 4 EH	6.76	6.68	54.3 K=1.00	23.671	4.4074	-11729.40	104330.00	0.112
T6	155.458 - 148.792	ROHN 4 EH	6.68	6.68	54.3 K=1.00	23.671	4.4074	-17058.50	104328.00	0.164
T7	148.792 - 142.021	ROHN 4 EH	6.78	6.68	54.3 K=1.00	23.671	4.4074	-26863.30	104330.00	0.257
T8	142.021 - 121.813	ROHN 5 EH	20.24	6.68	43.6 K=1.00	25.320	6.1120	-55437.80	154754.00	0.358
T9	121.813 - 101.604	ROHN 6 EHS	20.24	6.68	36.0 K=1.00	26.380	6.7133	-90234.70	177094.00	0.510
T10	101.604 - 81.3333	ROHN 6 EH	20.31	10.02	54.8 K=1.00	23.590	8.4049	-129083.00	198268.00	0.651
T11	81.3333 - 71.1667	ROHN 8 EHS	10.18	10.02	41.2 K=1.00	25.668	9.7193	-137741.00	249471.00	0.552
T12	71.1667 - 61	ROHN 8 EHS	10.18	10.02	41.2 K=1.00	25.668	9.7193	-167436.00	249471.00	0.671
T13	61 - 40.6667	ROHN 8 EHS	20.37	10.02	41.2 K=1.00	25.668	9.7193	-204576.00	249472.00	0.820
T14	40.6667 - 20.3333	ROHN 8 EH	20.37	10.02	41.8 K=1.00	25.582	12.7627	-241455.00	326501.00	0.740
T15	20.3333 - 0	ROHN 8 EH	20.37	10.02	41.8	25.582	12.7627	-277811.00	326501.00	0.851

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=1.00					

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	182.354 - 177.292	L2x2x3/16	7.80	4.04	123.1 K=1.00	9.827	0.7150	-125.25	7026.12	0.018
T2	177.292 - 172.292	L2x2x3/16	8.22	4.25	129.6 K=1.00	8.898	0.7150	-419.54	6361.78	0.066
T3	172.292 - 167.292	L2x2x3/16	8.66	4.47	136.1 K=1.00	8.061	0.7150	-1725.37	5763.61	0.299
T4	167.292 - 162.208	L2x2x3/16	9.10	4.68	142.7 K=1.00	7.335	0.7150	-1930.61	5244.54	0.368
T5	162.208 - 155.458	L2 1/2x2 1/2x1/4	10.46	5.43	132.6 K=1.00	8.492	1.1900	-2391.16	10105.60	0.237
T6	155.458 - 148.792	L2 1/2x2 1/2x1/4	11.02	5.70	139.4 K=1.00	7.683	1.1900	-2939.24	9143.21	0.321
T7	148.792 - 142.021	L2 1/2x2 1/2x1/4	11.59	5.98	146.2 K=1.00	6.984	1.1900	-3191.88	8311.12	0.384
T8	142.021 - 121.813	L2 1/2x2 1/2x1/4	13.31	6.84	167.1 K=1.00	5.348	1.1900	-6509.96	6364.43	1.023
T9	121.813 - 101.604	L3x3x1/4	14.99	7.66	155.3 K=1.00	6.194	1.4400	-7814.83	8919.81	0.876
T10	101.604 - 81.3333	L3 1/2x3 1/2x1/4	18.26	9.42	163.0 K=1.00	5.624	1.6900	-10157.20	9503.99	1.069
T11	81.3333 - 71.1667	L3 1/2x3 1/2x1/4	19.03	9.78	169.1 K=1.00	5.221	1.6900	-10703.10	8822.80	1.213
T12	71.1667 - 61	2L4x4x1/4x3/8	19.89	10.21	168.6 K=1.00	5.253	3.8800	-11574.00	20381.90	0.568
T13	61 - 40.6667	2L 'a' > 58.4334 in - 146 L4x4x1/4	21.66	11.09	167.4 K=1.00	5.329	1.9400	-12168.10	10337.50	1.177
T14	40.6667 - 20.3333	L4x4x5/16	23.47	11.99	181.9 K=1.00	4.512	2.4000	-12904.20	10827.90	1.192
T15	20.3333 - 0	2L4x4x5/16x3/8	25.31	12.91	213.9 K=1.00	3.263	4.8000	-13761.40	15664.00	0.879
		2L 'a' > 74.1135 in - 185								

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	182.354 - 177.292	L2x2x1/8	6.69	6.40	193.3 K=1.00	3.998	0.4844	-54.89	1936.75	0.028
T3	172.292 - 167.292	L2 1/2x2 1/2x3/16	7.72	7.43	180.2 K=1.00	4.600	0.9020	-425.72	4149.16	0.103
T6	155.458 - 148.792	L3x3x3/16	9.45	9.08	182.7 K=1.00	4.472	1.0900	-132.86	4874.89	0.027
T7	148.792 - 142.021	L3x3x3/16	10.14	9.77	196.7 K=1.00	3.861	1.0900	-277.00	4208.00	0.066

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 lb	Allow. P_a lb	Ratio P / P_a
T1	182.354 - 177.292	ROHN 3 EH	5.07	5.01	52.9	30.000	3.0159	48.43	90477.90	0.001
T2	177.292 - 172.292	ROHN 3 EH	5.01	5.01	52.9	30.000	3.0159	281.01	90477.90	0.003
T3	172.292 - 167.292	ROHN 3 EH	5.01	5.01	52.9	30.000	3.0159	1798.66	90477.90	0.020
T4	167.292 - 162.208	ROHN 3 EH	5.09	5.01	52.9	30.000	3.0159	6113.29	90477.90	0.068
T5	162.208 - 155.458	ROHN 4 EH	6.76	6.68	54.3	30.000	4.4074	8133.78	132223.00	0.062
T6	155.458 - 148.792	ROHN 4 EH	6.68	6.68	54.3	30.000	4.4074	12541.20	132223.00	0.095
T7	148.792 - 142.021	ROHN 4 EH	6.78	6.68	54.3	30.000	4.4074	20445.00	132223.00	0.155
T8	142.021 - 121.813	ROHN 5 EH	20.24	6.68	43.6	30.000	6.1120	42557.50	183359.00	0.232
T9	121.813 - 101.604	ROHN 6 EHS	20.24	6.68	36.0	30.000	6.7133	72214.50	201398.00	0.359
T10	101.604 - 81.3333	ROHN 6 EH	20.31	10.02	54.8	30.000	8.4049	105157.00	252148.00	0.417
T11	81.3333 - 71.1667	ROHN 8 EHS	10.18	10.02	41.2	30.000	9.7193	112516.00	291579.00	0.386
T12	71.1667 - 61	ROHN 8 EHS	10.18	10.02	41.2	30.000	9.7193	137665.00	291579.00	0.472
T13	61 - 40.6667	ROHN 8 EHS	20.37	10.02	41.2	30.000	9.7193	169280.00	291579.00	0.581
T14	40.6667 - 20.3333	ROHN 8 EH	20.37	10.02	41.8	30.000	12.7627	199679.00	382882.00	0.522
T15	20.3333 - 0	ROHN 8 EH	20.37	10.02	41.8	30.000	12.7627	228343.00	382882.00	0.596

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	182.354 - 177.292	L2x2x3/16	7.80	4.04	78.6	29.000	0.4308	123.73	12492.70	0.010
T2	177.292 - 172.292	L2x2x3/16	8.22	4.25	82.7	29.000	0.4308	348.58	12492.70	0.028
T3	172.292 - 167.292	L2x2x3/16	8.66	4.47	86.9	29.000	0.4308	1679.76	12492.70	0.134
T4	167.292 - 162.208	L2x2x3/16	9.10	4.68	91.1	29.000	0.4308	1950.27	12492.70	0.156
T5	162.208 - 155.458	L2 1/2x2 1/2x1/4	10.46	5.43	84.7	29.000	0.7519	2327.97	21804.40	0.107
T6	155.458 - 148.792	L2 1/2x2 1/2x1/4	11.02	5.70	89.0	29.000	0.7519	2784.88	21804.40	0.128
T7	148.792 - 142.021	L2 1/2x2 1/2x1/4	11.59	5.98	93.4	29.000	0.7519	3131.07	21804.40	0.144
T8	142.021 - 121.813	L2 1/2x2 1/2x1/4	13.31	6.84	106.7	29.000	0.7519	6493.00	21804.40	0.298
T9	121.813 - 101.604	L3x3x1/4	14.99	7.66	98.8	32.500	0.9394	7822.80	30529.70	0.256
T10	101.604 - 81.3333	L3 1/2x3 1/2x1/4	18.26	9.42	103.8	32.500	1.1034	10191.10	35861.70	0.284
T11	81.3333 - 71.1667	L3 1/2x3 1/2x1/4	19.03	9.78	107.7	32.500	1.1034	10505.10	35861.70	0.293
T12	71.1667 - 61	2L4x4x1/4x3/8	19.89	10.21	98.0	29.000	2.5819	11332.40	74874.40	0.151
T13	61 - 40.6667	2L 'a' > 58.4334 in - 145 L4x4x1/4	21.66	11.09	106.5	32.500	1.2909	11800.80	41955.50	0.281
T14	40.6667 - 20.3333	L4x4x5/16	23.47	11.99	116.1	32.500	1.5949	12545.60	51835.00	0.242
T15	20.3333 - 0	2L4x4x5/16x3/8 2L 'a' > 74.1135 in - 184	25.31	12.91	124.9	29.000	3.1898	13553.70	92505.50	0.147

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	182.354 - 177.292	L2x2x1/8	6.69	6.40	122.7	29.000	0.2930	33.67	8496.09	0.004
T3	172.292 - 167.292	L2 1/2x2 1/2x3/16	7.72	7.43	114.6	29.000	0.5710	419.18	16559.90	0.025
T6	155.458 - 148.792	L3x3x3/16	9.45	9.08	116.0	29.000	0.7120	678.60	20648.90	0.033
T7	148.792 - 142.021	L3x3x3/16	10.14	9.77	124.8	29.000	0.7120	611.13	20648.90	0.030

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	182.354 - 177.292	Leg	ROHN 3 EH	2	-266.65	72060.70	0.4	Pass
		Diagonal	L2x2x3/16	7	-125.25	9365.82	1.3	Pass
T2	177.292 - 172.292	Top Girt	L2x2x1/8	5	-54.89	2581.69	1.7 (b)	
		Leg	ROHN 3 EH	14	-642.70	72059.50	2.1	Pass
							0.9	Pass
T3	172.292 - 167.292	Diagonal	L2x2x3/16	16	-419.54	8480.25	4.9	Pass
		Leg	ROHN 3 EH	23	-3755.63	96055.31	3.9	Pass
		Diagonal	L2x2x3/16	28	-1725.37	7682.89	22.5	Pass
T4	167.292 - 162.208	Top Girt	L2 1/2x2 1/2x3/16	26	-425.72	5530.83	23.2 (b)	
		Leg	ROHN 3 EH	34	-9209.86	96057.31	7.7	Pass
							9.6	Pass
T5	162.208 - 155.458	Diagonal	L2x2x3/16	37	-1930.61	6990.97	27.6	Pass
		Leg	ROHN 4 EH	43	-11729.40	139071.88	8.4	Pass
		Diagonal	L2 1/2x2 1/2x1/4	50	-2391.16	13470.76	17.8	Pass
T6	155.458 - 148.792	Leg	ROHN 4 EH	52	-17058.50	139069.22	27.8 (b)	
		Diagonal	L2 1/2x2 1/2x1/4	59	-2939.24	12187.90	12.3	Pass
		Top Girt	L3x3x3/16	57	678.60	20648.90	24.1	Pass
T7	148.792 - 142.021	Leg	ROHN 4 EH	64	-26863.30	139071.88	34.2 (b)	
		Diagonal	L2 1/2x2 1/2x1/4	74	-3191.88	11078.72	3.3	Pass
		Top Girt	L3x3x3/16	69	-277.00	5609.26	10.1 (b)	
T8	142.021 - 121.813	Leg	ROHN 5 EH	76	-55437.80	206287.07	19.3	Pass
							28.8	Pass
T9	121.813 - 101.604	Diagonal	L2 1/2x2 1/2x1/4	83	-6509.96	8483.79	37.2 (b)	
		Leg	ROHN 6 EHS	97	-90234.70	236066.29	4.9	Pass
		Diagonal	L3x3x1/4	101	-7814.83	11890.11	9.8 (b)	
T10	101.604 - 81.3333	Leg	ROHN 6 EH	118	-129083.00	264291.23	26.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	122	-10157.20	12668.82	76.7	Pass
T11	81.3333 - 71.1667	Leg	ROHN 8 EHS	133	-137741.00	332544.83	38.2	Pass
							65.7	Pass
T12	71.1667 - 61	Diagonal	L3 1/2x3 1/2x1/4	137	-10703.10	11760.79	91.1 (b)	
		Leg	ROHN 8 EHS	142	-167436.00	332544.83	48.8	Pass
		Diagonal	2L4x4x1/4x3/8	146	-11574.00	27169.07	80.2	Pass
							83.6 (b)	
							41.4	Pass
							91.0	Pass
							50.4	Pass
							42.6	Pass
							65.8 (b)	

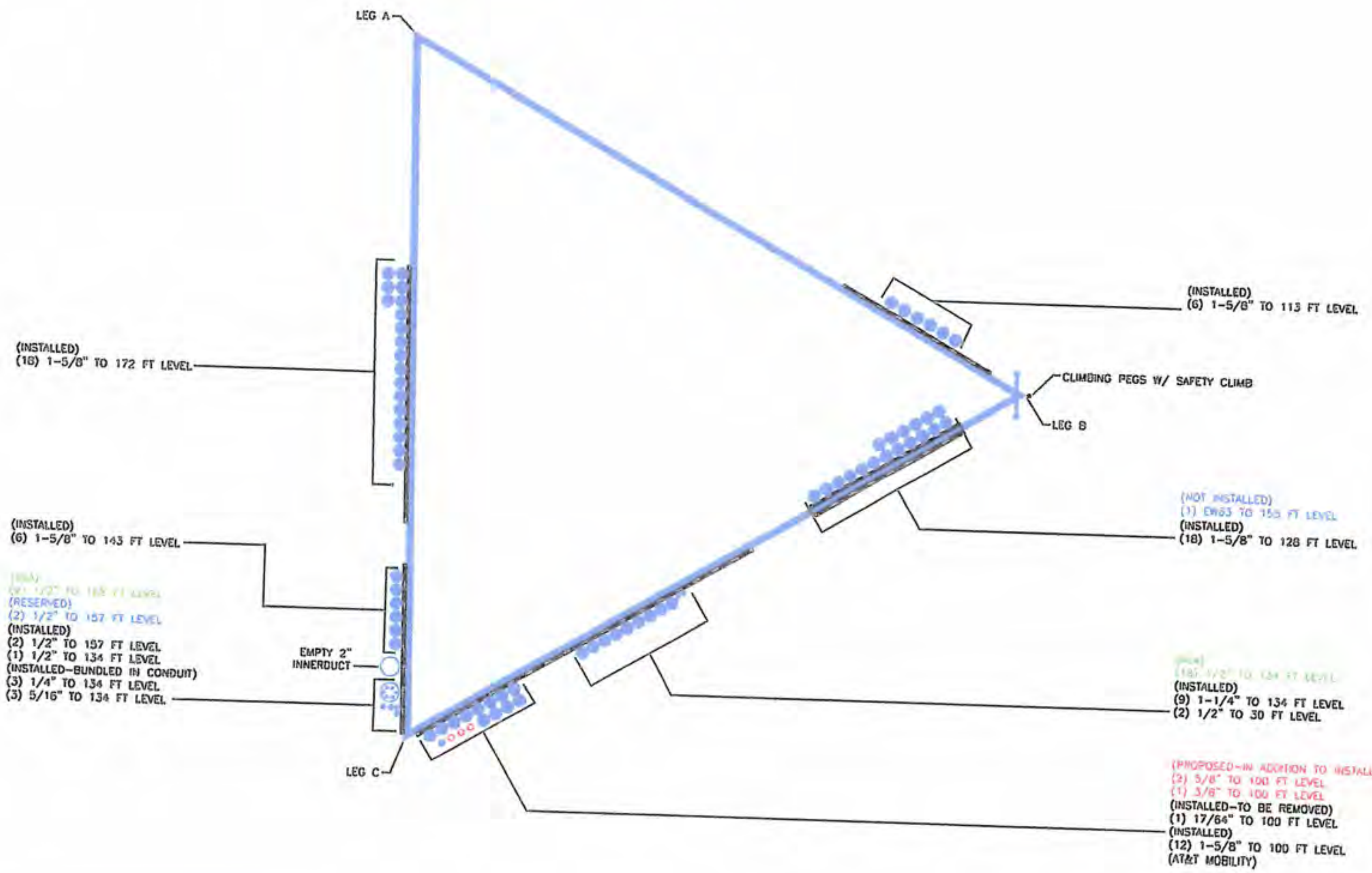
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T13	61 - 40.6667	Leg	ROHN 8 EHS	151	-204576.00	332546.16	61.5	Pass
		Diagonal	L4x4x1/4	155	-12168.10	13779.89	88.3	Pass
T14	40.6667 - 20.3333	Leg	ROHN 8 EH	166	-241455.00	435225.81	98.4 (b) 55.5	Pass
T15	20.3333 - 0	Diagonal	L4x4x5/16	170	-12904.20	14433.59	89.4	Pass
		Leg	ROHN 8 EH	181	-277811.00	435225.81	63.8	Pass
		Diagonal	2L4x4x5/16x3/8	185	-13761.40	20880.11	65.9	Pass
							78.7 (b)	
							Summary	
						Leg (T15)	63.8	Pass
						Diagonal (T13)	98.4	Pass
						Top Girt (T6)	10.1	Pass
						Bolt Checks	98.4	Pass
						RATING =	**98.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

CROWN REGION ADDRESS

USA



07/10/08 AS-BUILT INFORMATION ADDED PER WORK ORDER # 159001 CDS
20/12/08 APPLICATION ADDED PER WORK ORDER # 245925 EDS
01/05/09 AS-BUILT INFORMATION ADDED PER WORK ORDER # 256054 AC
08/09/09 APPLICATION ADDED PER WORK ORDER # 293992 ADC
07/12/09 APPLICATION ADDED PER WORK ORDER # 308032
12/05/10 AS-BUILT INFORMATION ADDED PER WORK ORDER # 325297
15/06/10 APPLICATION ADDED PER WORK ORDER # 341302
10/03/11 AS-BUILT INFORMATION ADDED PER WORK ORDER # 384798 & # 380563
14/03/11 APPLICATION ADDED PER WORK ORDER # 394615

DRAWN BY: KDI/DK
CHECKED BY:
DRAWING DATE: 18/08/06

SITE NUMBER:
SITE NAME:

SITE NAME

BRG 134 943057

BUSINESS UNIT NUMBER

807133

SITE ADDRESS

50 ROCKLAND ROAD
SO NORWALK, CT 06854
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

LEGEND: FEEDLINES

- SOLID BLUE CIRCLE DENOTES EXISTING FEEDLINE
- OPEN RED CIRCLE DENOTES PROPOSED FEEDLINE
- BLUE "X" DENOTES LOCATION NOT GIVEN

NOTE: ASSUME FEEDLINE ATTACHMENT HEIGHT TO TOWER STEEL AT 8-FEET ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED

SCALE: N.T.S. 1

BUSINESS UNIT: 807133 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

PLOT DATE: 3/14/2011 FILE NAME: 807133 BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

ANCHOR BOLT CALCULATIONS

Customer:	Crown Castle
Site Name:	BRG 134, CT BU#807133
Job Number:	2011-004-027
Tower Model:	180' Rohn SSV Self-Supporting Tower
Date:	3/22/2011

Input Information:

# Bolts	10	
Bolt Diameter	1	in
Allowable Tension, F_u	125	ksi
Steel Grade	A193 B7	
Applied Shear	34.261	kips
Uplift per Leg	227.022	kips

Bolt Cross-Sectional Area, **A**	0.785	in^2
Applied Shear, f_v	4.36	ksi
Maximum Allowable Tensile Stress, F_t	41.25	ksi
Allowable Tension Force	323.98	kips
Maximum Allowable	431.86	kips
% Capacity	**52.6%**	

The Bolt Group is sufficient for the applied Uplift Force

Maximum Allowable Tensile Stress, F_t

$$0.43F_u - 1.8f_v \leq 0.33F_u$$

This equation is for threaded parts, A449 bolts over 1 1/2" dia. (threads included in shear plane) Manual of Steel Construction ASD, 9th Edition, pg. 5-74, Table J3.3

P65-16-XLH-RR : Dual Broadband Antennas

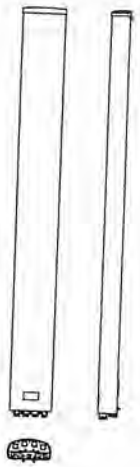
POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 65, 65
GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
TILT: 1-12, 0-8
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	698-894			1710-2170		
Frequency band (MHz)	698-806		806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14.8/12.7		15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Polarization	Dual Linear +/- 45				Dual Linear +/- 45	
Nominal Impedance (Ω)	50				50	
VSWR	< 1.5:1				< 1.5:1	
Horizontal beam width, -3 dB (°)	66		65	60	63	63
Vertical beam width, -3 dB (°)	14.7		12.5	6.8	6.4	5.7
Electrical down tilt (°)	1 to 12				0 to 8	
Side lobe suppression, vertical 1st upper (dB)	> 16		>16	> 16		
Isolation between inputs (dB)	>16		>16			
Inter band Isolation (dB)	> 30		> 30	> 30	> 30	
Tracking, horizontal plane ±60° (dB)	> 40				> 40	
First null fill (dB)	< 2			< 2	< 2	< 2
Vertical beam squint (°)				>-20	>-20	>-20
Front to back ratio (dB) 180°±30° copolar	< 0.8		< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) 180°±30° total power	>24		>24	> 30	>30	>28
Cross polar discrimination (XPD) 0° (dB)	> 15		> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) ±60° (dB)	> 10		> 10	> 10	> 10	> 10
Far field coupling						
IM3, 2xTx@43dBm (dBc)	<-153				<-153	
IM7, 2xTx@43dBm (dBc)						
Power handling, average per input (W)	500				250	
Power handling, average total (W)	1000				500	

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

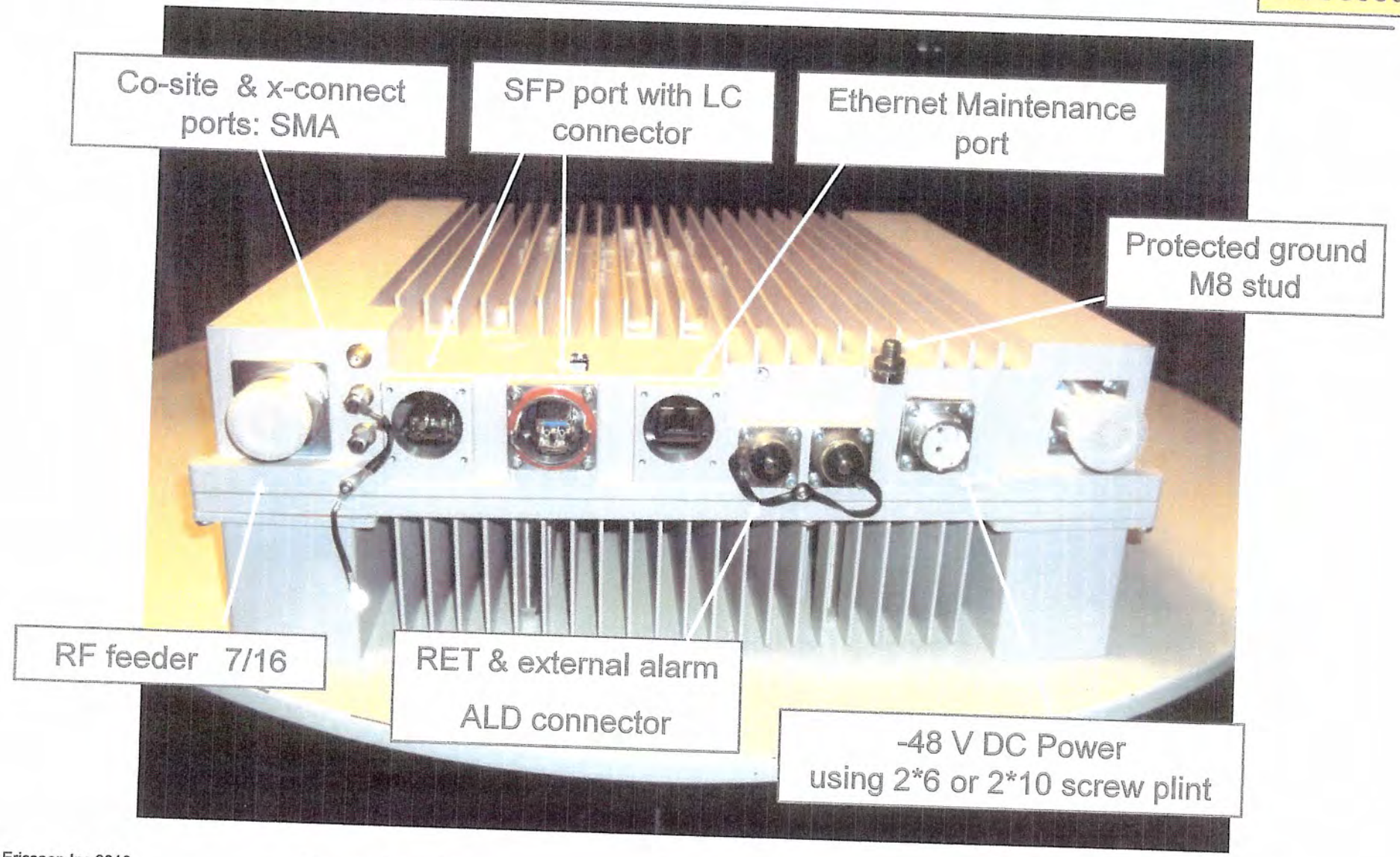
RRUS 11 – Dual PA RRU.
Technical Data

RBS6000

- Multi standard
- RF: 2x30 Watts
- Carrier BW: 1.4 – 20 MHz
- Alarms: 2
- Dimensions (with sunshield):
  - Width: 17.0 in
  - Height: 17.8 in
  - Depth: 7.2 in
  - Weight: 55 lbs (Band 12)
  - Weight: 50 lbs (Band 4)
- Temperature: -40 to +131 F
- Cooling: Self convection
- Power: -48 VDC
- Rec. fuse size 20 Amp
  - Rec. DC cable:
    - 6 mm^2 up to 60 meters
    - 10 mm^2 over 60 meters
    - Shielded
- Power Cons: 200 Watts typ.

RRUS-11 I/F

RBS6000



TT19-08BP111-001 | TMA Twin 1900 with 850 Bypass 12 dB AISG 1.1

ELECTRICAL SPECIFICATIONS

UL Frequency Range (MHz)	1850-1910 with 824-894 bypass
UL Rejection	>77 dB
UL Gain(dB)	12
UL Return Loss	>18
UL Noise Figure	<1.7 dB, Typical
UL Output 3rd Order Intercept Point(dBm)	>+23
UL Bypass Loss(dB)	2.5, Typical
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	1930-1990 with 824-894 bypass
DL Return Loss	>18
DL Insertion Loss (dB)	850 MHz, <0.3; 1900 MHz, <0.5
Intermodulation	@ 2 x +43 dBm TX carriers, in receive band, <160 dBc, reffered to antenna port
Input Voltage (V)	AISG Mode: 10-30; Current alarm mode: 8 -17
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.1W @12V
Power Handling, RMS	850: >57 dBm; 1900: >55 dBm
AISG Compatibility	AISG 1.1 fully upgreadable to AISG 2.0 (AISG version only dependent on loaded SW version) TT19-08BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS

Dimension HxWxD mm(ft)	250x169x137 mm (9.9"x6.7"x5.4")
Weight(lbs)	<16
Colors	Off white (NCS 1502-R)
RF Connectors	DIN 7/16 female, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-40° C to +65° C (-40° F to +149° F)
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	3 kA 10/350 µs; 20 kA (Shield)
Housing	Aluminum
MTBF	>1 million hours per TMA
Ingress Protection	IP65 and IP68

APPROVAL AND TESTS

Safety	EN60950
EMC	3GPP: TS 25.113

*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.

POWER

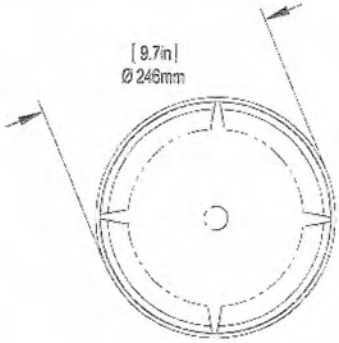
DC6-48-60-18-8F

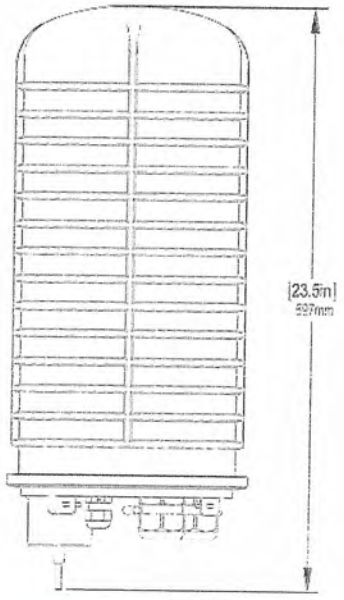
DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.





Raycap

Phone 208.777.1166 Toll Free 800.890.2569 Fax 208.777.4466 www.raycapsurgeprotection.com

DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 µs
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 – 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)

GS-07F-0435V

Certified to ISO 9001:2000

TÜV Rheinland of North America

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

March 30, 2011

Mr. Richard A. Moccia
Mayor, City of Norwalk
Norwalk City Hall
125 East Ave.
Norwalk, CT 06851-3200

Re: Telecommunications Facility – 50 Rockland Road Norwalk, CT

Dear Mayor Moccia:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure