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Also admitted in Massachusetts

March 17, 2014

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

Re: **Notice of Exempt Modification – Facility Modification
50 Rockland Road, Norwalk, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 128-foot level of the existing 180-foot tower at 50 Rockland Road in Norwalk, Connecticut (the “Property”). The tower and the Property are owned by Crown Castle. The Council approved Cellco’s use of the existing tower in 1987 (Docket No. 73). Cellco now intends to modify its facility by adding three (3) model MGD3-800TX, 2100 MHz antennas, for a total of fifteen (15) antennas at the same 128-foot level on the tower. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for Cellco’s additional antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Harry Rilling, Mayor of the City of Norwalk.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. The new antennas and RRHs will be located at the 128-foot level on the 180-foot tower.



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Melanie A. Bachman
March 17, 2014
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2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state 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 standard. A cumulative worst-case RF emissions calculation for Cellco's modified facility is included in Attachment 2.

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

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

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Harry Rilling, Norwalk Mayor
Sandy M. Carter



ATTACHMENT 1



SINGLE-BAND PANEL ANTENNA

BROADBAND 1710-2170 MHz

MGD3-800TX

ELECTRICAL SPECIFICATIONS

BROADBAND 1710-2170 MHz

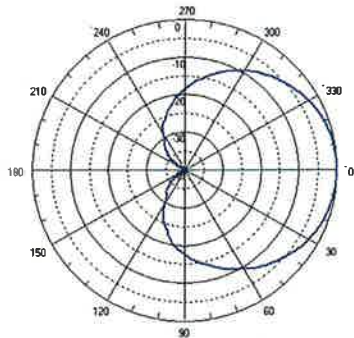
1710 - 2170		
1710-1880	1850-1990	1920-2170
H66° V7.2°	H64° V6.6°	H63° V6.3°
Fixed Tilt	Fixed Tilt	Fixed Tilt
0°, 2°, 4°, 6°	0°, 2°, 4°, 6°	0°, 2°, 4°, 6°

Antenna Model	MGD3-800TX		
Polarization	± 45°		
Frequency	1710-2170		
	1710 - 1880	1850 - 1990	1920 - 2170
Horizontal Beamwidth	66°	64°	63°
Vertical Beamwidth	7.2°	6.6°	6.3°
Gain (dBi)	18	18	18.5
Vertical Electrical Tilt	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°	FIXED 0°, 2°, 4°, 6°
Upper Sidelobe Suppression for the 1 st lobe above main beam (dB)	20	20	20
Front-to-Back Ratio @ 180° ± 20° (dB)	> 30	> 30	> 30
VSWR	< 1.4 : 1	< 1.4 : 1	< 1.4 : 1
Cross Polar Ratio @ ± 60° (dB)	> 10	> 10	> 10
Isolation between Ports (dB)	> 30	> 30	> 30
Maximum Power Per Input (W)	250		
Intermodulation (dBc)	< - 150		
Impedance (Ω)	50		

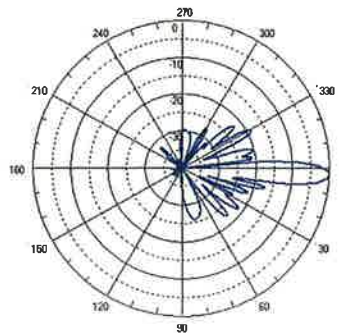


MECHANICAL SPECIFICATIONS

Connectors	2 X 7/16 Female	
Connector Position	Bottom	
Survival Wind Speed	km/h (mph)	
	200 (125)	
Front Windload	370 (85)	
N @ 160 km/h (lbs @ 100 mph)		
Lateral Windload	170 (40)	
N @ 160 km/h (lbs @ 100 mph)		
Radome Color	Grey, paintable	
Humidity	100%	
Antenna Weight	kg (lbs)	
	7 (15)	
Antenna Dimension	1340 X 170 X 100 (53 X 7 X 4)	
mm (in) H X W X D		



H&V Pattern



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Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low

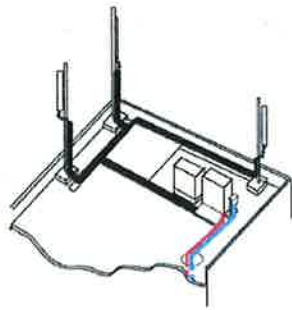
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

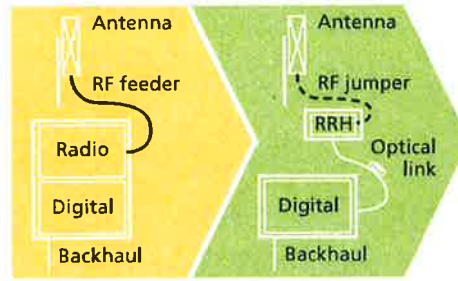
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.



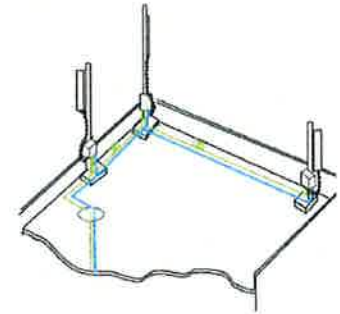
Macro

Features

- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption



RRH for space-constrained cell sites



Distributed

Benefits

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170mm (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
 - With solar load: -40°C to +50°C (-40°F to +122°F)
 - Without solar load: -40°C to +55°C (-40°F to +131°F)

- Passive convection cooling (no fans)
- Enclosure protection
 - IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
 - TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
 - One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
 - Single mode dual fiber (SM/DF)
- Multi-mode variant
 - Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

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HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

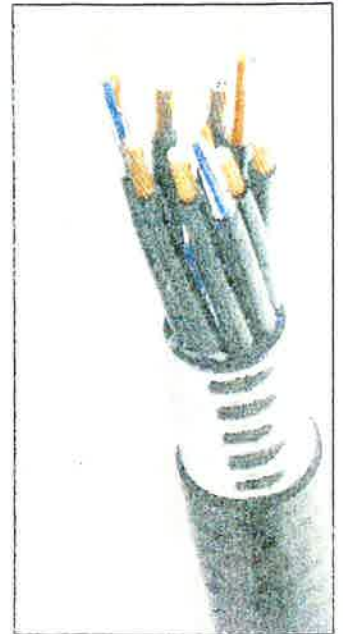


Figure 1: HYBRIFLEX Series

Technical Specifications

Dimensions			
Outer Conductor Armor	Corrugated Aluminum	[mm (in.)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in.)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Mechanical Properties			
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in.)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in.)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm ² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Optical Properties			
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[μm]	50/125
Primary Coating (Acrylate)		[μm]	245
Buffer Diameter, Nominal		[μm]	900
Secondary Protection, Jacket, Nominal		[mm (in.)]	2.0 (0.08)
Minimum Bending Radius		[mm (in.)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL34-V0, UL1666 RoHS Compliant
DC Power Cable Properties			
Size (Power)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in.)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1374), IEEE1202/FT4 RoHS Compliant
Environmental			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

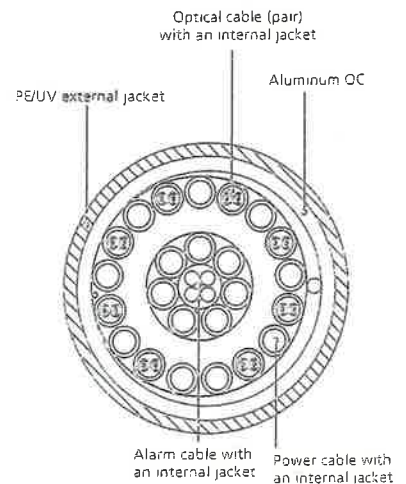


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 2

Site Name: Norwalk Tower Height: Verizon @ 129t		General		Power		Density		MAX. PERMISS. EXP.		FRACTION MPE		Total	
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE						
*AT&T GSM	3	296	107	0.0279	880	0.5867	4.75%						
*AT&T GSM	2	427	107	0.0268	1900	1.0000	2.68%						
*AT&T UMTS	1	500	107	0.0157	880	0.5867	2.68%						
*AT&T UMTS	2	500	107	0.0314	1900	1.0000	3.14%						
*AT&T LTE	1	500	107	0.0157	740	0.4933	3.18%						
*MetroPCS	7	734.8	115	0.1398	2130	1.0000	13.98%						
*Clearwire	2	153	135	0.0060	2496	1.0000	0.60%						
*Clearwire	1	211	135	0.0042	23 GHz	1.0000	0.42%						
*Sprint Nextel iDEN	12	100	135	0.0237	851	0.5673	4.17%						
*Sprint Nextel WiMAX	3	562	135	0.0333	2657	1.0000	3.33%						
*Sprint Nextel microwave	2	31.6	135	0.0012	22500	1.0000	0.12%						
*T-Mobile LTE	2	24	173	0.0006	2100	1.0000	0.06%						
*T-Mobile GSM/UMTS	2	12	173	0.0003	1950	1.0000	0.03%						
*T-Mobile UMTS	2	12	173	0.0003	2100	1.0000	0.03%						
*Sprint CDMA/LTE	5	778	145	0.0665	1900	1.0000	6.65%						
*Sprint CDMA/LTE	1	438	145	0.0075	850	0.5667	1.32%						
Verizon	15	429	128	0.1412	1970	1.0000	14.12%						
Verizon	9	316	128	0.0624	869	0.5793	10.77%						
Verizon	1	1750	128	0.0384	2145	1.0000	3.84%						
Verizon	1	686	128	0.0151	698	0.4653	3.24%						79.13%
* Source: Siting Council													

ATTACHMENT 3



Date: January 29, 2014

Steve Tuttle
Crown Castle
8 Parkmeadow Drive
Pittsford, NY 14534

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Name: Norwalk

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

01-29-2014

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tnxTower Output

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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	APXVSP18-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	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.

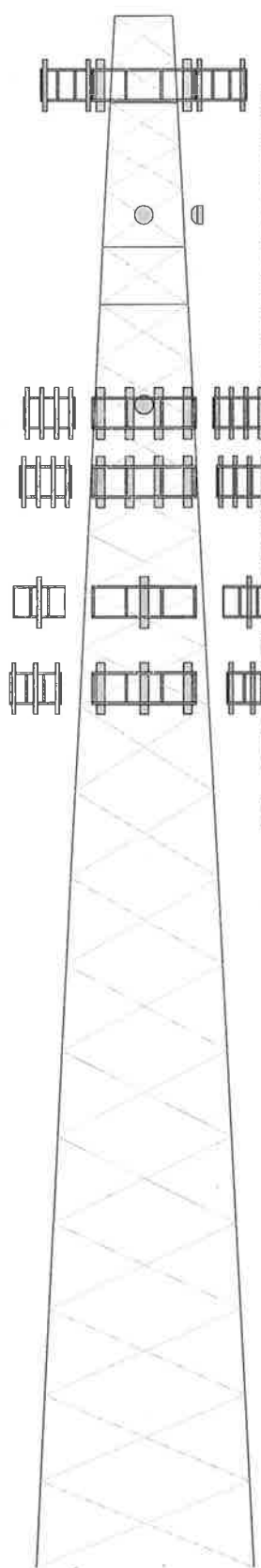
4.1) Recommendations

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

Section	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	
Legs	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH
Leg Grade	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50
Diagonal	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36
Top Grid	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18
Mid Grid	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18	L22x18
Face Width (ft)	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10	10 @ 10
# Panels (ft)	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5	4 @ 5
Weight (K)	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

180.0 ft
150.0 ft
120.0 ft
90.0 ft
60.0 ft
30.0 ft
0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Empty Pipe Mount	178	M0 D3-800TV w/ Mount Pipe	126
Empty Pipe Mount	178	M0 D3-800TV w/ Mount Pipe	126
Side Arm Mount (SO 305-1)	178	M0 D3-800TV w/ Mount Pipe	126
Side Arm Mount (SO 305-1)	178	FES 16-XL-2 w/ Mount Pipe	126
ERICSSON AIR 21 B2A B3P w/ Mount Pipe	172	GPS_A	126
ERICSSON AIR 21 B2A B3P w/ Mount Pipe	172	RRH2X40-AWB	126
ERICSSON AIR 21 B2A B3P w/ Mount Pipe	172	RRH2X40-AWB	126
ERICSSON AIR 21 B4A B3P w/ Mount Pipe	172	M0 D3-800TV w/ Mount Pipe	126
ERICSSON AIR 21 B4A B3P w/ Mount Pipe	172	M0 D3-800TV w/ Mount Pipe	126
ERICSSON AIR 21 B4A B3P w/ Mount Pipe	172	M0 D3-800TV w/ Mount Pipe	126
RRY 112 5441	172	M0 D3-800TV w/ Mount Pipe	126
RRY 112 1441	172	D6-11-62-846-02	126
RRY 112 1441	172	Sector Mount (SM 411-2)	126
(2) Empty Mount Pipe	172	LNK-631405-T40 w/ Mount Pipe	126
(2) Empty Mount Pipe	172	LNK-631405-T40 w/ Mount Pipe	126
(2) Empty Mount Pipe	172	(2) DB4405SAXY w/ Mount Pipe	126
Sector Mount (SM 802-2)	172	Empty Mount Pipe	112
Side Arm Mount (SO 311-3)	157	Empty Mount Pipe	112
WHLPS-18	157	Empty Mount Pipe	112
WHLPS-18	157	Sector Mount (SM 104-0)	112
800MHz RRH	143	800 10504 w/ Mount Pipe	112
800MHz 2X30W RRH	143	800 10504 w/ Mount Pipe	112
800MHz 2X30W RRH	143	800 10504 w/ Mount Pipe	112
800MHz 2X30W RRH	143	(2) LOP135F	102
PCS 1900MHz 4-45W-45MHz	143	(2) LOP135F	102
PCS 1900MHz 4-45W-45MHz	143	(2) LOP13319	102
PCS 1900MHz 4-45W-45MHz	143	(2) LOP140X	102
(2) ACU-A20-N	143	(2) LOP140X	102
(2) ACU-A20-N	143	(2) LOP140X	102
(2) ACU-A20-N	143	(2) RRLUS-11	102
AFXVSP18-C-A20 w/ Mount Pipe	143	(2) RRLUS-11	102
AFXVSP18-C-A20 w/ Mount Pipe	143	(2) RRLUS-11	102
AFXVSP18-C-A20 w/ Mount Pipe	143	FES 16-XL-4RB w/ Mount Pipe	102
Side Arm Mount (SO 312-2)	143	FES 16-XL-4RB w/ Mount Pipe	102
800 MHz RRH	143	FES 16-XL-4RB w/ Mount Pipe	102
800 MHz RRH	143	D08-48-50-18-3P	102
LLPX310R w/ Mount Pipe	134	Empty Mount Pipe	102
(2) DB44-60-XY w/ Mount Pipe	134	Empty Mount Pipe	102
(2) DB44-60-XY w/ Mount Pipe	134	Empty Mount Pipe	102
(2) DB44-60-XY w/ Mount Pipe	134	Sector Mount (SM 301-2)	102
FDO_R6_RRH1	134	(2) 770 00 w/ Mount Pipe	102
FDO_R6_RRH1	134	(2) 770 00 w/ Mount Pipe	102
FDO_R6_RRH1	134	(2) 770 00 w/ Mount Pipe	102
Pipe Mount (PM 801-1)	134	Side Arm Mount (SO 701-1)	30
Sector Mount (SM 902-2)	134	GPS_A	30
LLPX310R w/ Mount Pipe	134	GPS_A	30
LLPX310R w/ Mount Pipe	134	Side Arm Mount (SO 701-1)	30
WHLPS-23	134	VE-1069	12
(2) DB44-60-XY w/ Mount Pipe	126	GPS_A	12
(2) DB44-60SAXY w/ Mount Pipe	126	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

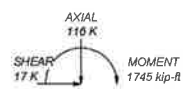
TOWER DESIGN NOTES

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

MAX. CORNER REACTIONS AT BASE:

DOWN: 272 K
SHEAR: 35 K

UPLIFT: -222 K
SHEAR: 29 K



TORQUE 16 kip-R

38 mph WIND - 0.7500 in ICE

AXIAL 80 K



TORQUE 56 kip-R
REACTIONS - 85 mph WIND

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

Project: BRG 134 943057 (BU# 807133)
1421YV1400
Client: Crown Castle
Drawn by: Jeffrey B. Ray
Date: 01/20/14
Scale: NTS
Dwg No: E-1

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

Tower Input Data

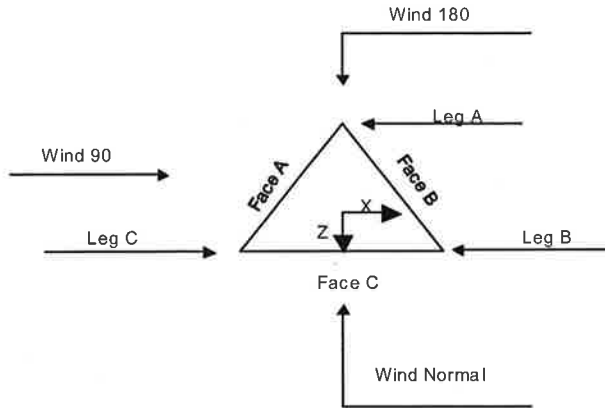
The main tower is a 3x free standing tower with an overall height of 180' above the ground line.
 The base of the tower is set at an elevation of 0' above the ground line.
 The face width of the tower is 6'8-1/4" at the top and 25' at the base.
 This tower is designed using the TIA/EIA-222-F standard.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

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque √ Include Angle Block Shear Check <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|---|---|

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	Client Crown Castle	Designed by Jeffrey B. Ray



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
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
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
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

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	Project 1421YV1400	Date 16:51:03 01/29/14
	Client Crown Castle	Designed by Jeffrey B. Ray

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
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	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
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	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
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)

tnxTower FDH Engineering, Inc. 6521 Meridien Drive, Suite 107 Raleigh, North Carolina Phone: 9197551012 FAX: 9197551031	Job BRG 134 943057 (BU# 807133)	Page 4 of 53
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	Client Crown Castle	Designed by Jeffrey B. Ray

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 Horizontal 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"-1 46'8-1/32"	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T4 146'8-1/32"-14 0'	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

tnxTower FDH Engineering, Inc. 6521 Meridien Drive, Suite 107 Raleigh, North Carolina Phone: 9197551012 FAX: 9197551031	Job	BRG 134 943057 (BU# 807133)	Page	7 of 53
	Project	1421YV1400	Date	16:51:03 01/29/14
	Client	Crown Castle	Designed by	Jeffrey B. Ray

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	A	Yes	Af (CfAe)	157' - 0'	0.0000	-0.4	1	1	3.0000	3.0000	12.0000	0.01
Ladder (Af)												
7983A(1/2")	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	1	1	0.5800	0.0000		0.00
2" Rigid	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	2	2	1.0000	2.0000		0.00
Conduit												
9207(5/16")	A	Yes	Ar (CfAe)	134' - 0'	0.0000	-0.45	6	6	0.3300	0.0000		0.00
*												
MLE Hybrid	A	Yes	Ar (CfAe)	143' - 0'	0.0000	-0.4	3	3	1.0000	1.2500		0.00
3Power/6Fiber												
RL 2												
10AWG(1-1/4')												
*												
LCF158-50JA	A	Yes	Ar (CfAe)	172' - 0'	0.0500	0	7	3	1.0000	1.9800		0.00
-A0(1 5/8")												
LCF158-50JA	A	Yes	Ar (CfAe)	172' - 0'	0.0000	0	6	6	1.0000	1.9800		0.00
-A0(1 5/8")												
Feedline	A	Yes	Af (CfAe)	172' - 0'	0.0000	0	1	1	3.0000	3.0000	12.0000	0.01
Ladder (Af)												
*												
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	B	Yes	Af (CfAe)	113' - 0'	0.0000	0.35	1	1	3.0000	3.0000	12.0000	0.01
Ladder (Af)												
Safety Line	B	No	Ar (Leg)	180' - 0'	0.0000	0	1	1	0.3750	0.3750		0.00
3/8												
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	C	Yes	Af (CfAe)	128' - 0'	-1.0000	-0.3	2	1	3.0000	3.0000	12.0000	0.01
Ladder (Af)												
*												
LDF6-50A(1-1/4")	C	Yes	Ar (CfAe)	134' - 0'	0.0000	0.15	9	9	1.0000	1.5500		0.00
Feedline	C	Yes	Af (CfAe)	134' - 0'	0.0000	0.25	1	1	3.0000	3.0000	12.0000	0.01
Ladder (Af)												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	30' - 0'	0.0000	0.15	2	2	0.6300	0.6300		0.00
*												
CR 50	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	12	8	1.0000	1.9800		0.00
1873(1-5/8")												
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	C	Yes	Ar (CfAe)	102' - 0'	0.0000	0.4	1	1	2.0000	2.0000		0.00
Conduit												
**												

Feed Line/Linear Appurtenances - Entered As Area

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Description	Face or Shield Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA} 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} In Face ft ²	C _{AA} 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} In Face ft ²	C _{AA} 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

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T3	153'3-31/32"-146' 8-1/32"	C		1.213	0.000	0.000	0.000	0.00
		A	0.899	5.520	16.899	0.000	0.000	0.53
		B		1.208	0.000	0.000	0.000	0.01
T4	146'8-1/32"-140'	C		1.208	0.000	0.000	0.000	0.00
		A	0.895	6.264	18.017	0.000	0.000	0.55
		B		1.202	0.000	0.000	0.000	0.01
T5	140'-120'	C		1.202	0.000	0.000	0.000	0.00
		A	0.884	29.961	63.554	0.000	0.000	1.98
		B		3.572	0.000	0.000	0.000	0.03
T6	120'-100'	C		9.706	47.211	0.000	0.000	1.40
		A	0.867	33.203	65.801	0.000	0.000	2.07
		B		7.536	20.643	0.000	0.000	0.51
T7	100'-80'	C		16.401	90.811	0.000	0.000	2.95
		A	0.846	32.722	65.710	0.000	0.000	2.04
		B		9.565	31.713	0.000	0.000	0.76
T8	80'-70'	C		32.289	122.976	0.000	0.000	3.86
		A	0.828	16.148	32.814	0.000	0.000	1.01
		B		4.721	15.836	0.000	0.000	0.38
T9	70'-60'	C		15.931	61.448	0.000	0.000	1.91
		A	0.814	15.983	32.783	0.000	0.000	1.00
		B		4.674	15.821	0.000	0.000	0.37
T10	60'-40'	C		15.767	61.416	0.000	0.000	1.90
		A	0.788	31.378	65.454	0.000	0.000	1.97
		B		9.181	31.585	0.000	0.000	0.73
T11	40'-20'	C		30.945	122.720	0.000	0.000	3.75
		A	0.750	30.483	65.283	0.000	0.000	1.92
		B		8.925	31.500	0.000	0.000	0.71
T12	20'-0'	C		31.825	123.600	0.000	0.000	3.70
		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

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Section	Elevation ft	Face	A_R	$A_{R\ Ice}$	A_F	$A_{F\ Ice}$
			ft ²	ft ²	ft ²	ft ²
T8	80'-70'	C	0.000	5.120	6.207	10.592
		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
		A	0.000	2.897	4.067	7.349
T10	60'-40'	B	0.000	1.128	1.849	2.862
		C	0.000	4.471	6.714	11.343
		A	0.000	2.676	3.995	7.136
		B	0.000	1.047	1.816	2.793
T11	40'-20'	C	0.000	4.229	6.673	11.276
		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 ft	CP_X	CP_Z	$CP_X\ Ice$	$CP_Z\ Ice$
		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:		Azimuth Adjustment	Placement	$C_{AA}\ Front$	$C_{AA}\ Side$	Weight
			Horz	Lateral					
Empty Pipe Mount	A	From Leg	4.00	0.0000	178'	No Ice	1.00	1.00	0.01
						1/2" Ice	1.39	1.39	0.02
						1" Ice	1.70	1.70	0.03
						2" Ice	2.35	2.35	0.06
						4" Ice	3.78	3.78	0.18
Empty Pipe Mount	B	From Leg	4.00	0.0000	178'	No Ice	1.00	1.00	0.01
						1/2" Ice	1.39	1.39	0.02

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						°
				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'	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'	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 B4P w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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 B4P w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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 B4P w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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 B2P w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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 B2P w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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 B2P w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	172'	No Ice	6.83	5.64	0.11
				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'	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'	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'	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

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(2) Empty Mount Pipe	A	From Leg	4.00	0'	0.0000	172'	2" Ice	0.82	0.51	0.03
							4" Ice	1.36	0.97	0.08
							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
(2) Empty Mount Pipe	B	From Leg	4.00	0'	0.0000	172'	4" Ice	5.42	5.42	0.26
							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'	0.0000	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
							No Ice	1.40	1.40	0.03
Sector Mount [SM 602-3]	C	None	0.0000	0'	0.0000	172'	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
							No Ice	33.11	33.11	1.54
							1/2" Ice	44.90	44.90	2.16
* Side Arm Mount [SO 311-3]	C	None	0.0000	0'	0.0000	157'	1" Ice	56.69	56.69	2.78
							2" Ice	80.27	80.27	4.01
							4" Ice	127.43	127.43	6.49
							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
* 800 MHz RRH	A	From Leg	4.00	0'	0.0000	143'	2" Ice	21.88	21.88	0.57
							4" Ice	36.48	36.48	0.96
							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
800 MHz RRH	B	From Leg	4.00	0'	0.0000	143'	4" Ice	4.46	3.93	0.32
							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'	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
							No Ice	2.49	2.07	0.05
800MHz 2X50W RRH	A	From Leg	4.00	0'	0.0000	143'	1" Ice	2.93	2.48	0.10
							2" Ice	3.41	2.93	0.16
							4" Ice	4.46	3.93	0.32
							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
800MHz 2X50W RRH	B	From Leg	4.00	0'	0.0000	143'	2" Ice	3.41	2.93	0.16
							4" Ice	4.46	3.93	0.32
							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
800MHz 2X50W RRH	C	From Leg	4.00	0'	0.0000	143'	4" Ice	4.46	3.93	0.32
							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

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	Client	Crown Castle	Designed by	Jeffrey B. Ray

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
							ft ²	ft ²	K
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00	0.0000	143'	2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
						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
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00	0.0000	143'	4" Ice	4.86	4.74	0.35
						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	0.0000	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
						4" Ice	4.86	4.74	0.35
(3) ACU-A20-N	A	From Leg	4.00	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
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	B	From Leg	4.00	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
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	C	From Leg	4.00	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
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	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
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	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
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	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
						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	
					4" Ice	39.47	39.47	1.08	
* LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	134'	No Ice	5.07	2.98	0.05
			0'			1/2" Ice	5.48	3.53	0.08
			1'			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23

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	Client Crown Castle	Designed by Jeffrey B. Ray

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft			ft ²	ft ²	K
			ft	ft			ft ²	ft ²	K
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	134'	4" Ice	8.70	8.13	0.54
			0'			No Ice	5.07	2.98	0.05
			1'			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
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	134'	4" Ice	8.70	8.13	0.54
			0'			No Ice	5.07	2.98	0.05
			1'			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
(3) DB844H90-XY w/ Mount Pipe	A	From Leg	4.00	0.0000	134'	4" Ice	8.70	8.13	0.54
			0'			No Ice	3.10	5.15	0.03
			1'			1/2" Ice	3.48	5.83	0.07
						1" Ice	3.88	6.52	0.11
						2" Ice	4.76	7.96	0.22
(3) DB844H90-XY w/ Mount Pipe	B	From Leg	4.00	0.0000	134'	4" Ice	6.66	11.09	0.55
			0'			No Ice	3.10	5.15	0.03
			1'			1/2" Ice	3.48	5.83	0.07
						1" Ice	3.88	6.52	0.11
						2" Ice	4.76	7.96	0.22
(3) DB844H90-XY w/ Mount Pipe	C	From Leg	4.00	0.0000	134'	4" Ice	6.66	11.09	0.55
			0'			No Ice	3.10	5.15	0.03
			1'			1/2" Ice	3.48	5.83	0.07
						1" Ice	3.88	6.52	0.11
						2" Ice	4.76	7.96	0.22
FDD_R6_RRH	A	From Leg	4.00	0.0000	134'	4" Ice	3.49	2.14	0.20
			0'			No Ice	1.79	0.78	0.03
			1'			1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
FDD_R6_RRH	B	From Leg	4.00	0.0000	134'	4" Ice	3.49	2.14	0.20
			0'			No Ice	1.79	0.78	0.03
			1'			1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
FDD_R6_RRH	C	From Leg	4.00	0.0000	134'	4" Ice	3.49	2.14	0.20
			0'			No Ice	1.79	0.78	0.03
			1'			1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
Pipe Mount [PM 601-1]	A	From Leg	4.00	0.0000	134'	4" Ice	3.49	2.14	0.20
			0'			No Ice	3.00	0.90	0.07
			0'			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
Sector Mount [SM 502-3]	C	None		0.0000	134'	4" Ice	8.92	2.66	0.18
						No Ice	33.02	33.02	1.67
						1/2" Ice	47.36	47.36	2.22
						1" Ice	61.70	61.70	2.77
						2" Ice	90.38	90.38	3.88
* LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.00	0.0000	126'	4" Ice	147.74	147.74	6.08
			0'			No Ice	8.57	7.00	0.06
			2'			1/2" Ice	9.22	8.19	0.13
						1" Ice	9.84	9.08	0.20
						2" Ice	11.10	10.90	0.38
					4" Ice	13.75	14.93	0.89	

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	Client		Crown Castle		Designed by		Jeffrey B. Ray	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.00	0.0000	126'	No Ice	8.57	7.00	0.06
			0'			1/2" Ice	9.22	8.19	0.13
			2'			1" Ice	9.84	9.08	0.20
						2" Ice	11.10	10.90	0.38
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00	0.0000	126'	No Ice	4.90	4.92	0.03
			0'			1/2" Ice	5.35	5.60	0.08
			2'			1" Ice	5.80	6.28	0.13
						2" Ice	6.73	7.71	0.26
(2) DB844H80-XY w/ Mount Pipe	B	From Leg	4.00	0.0000	126'	No Ice	3.10	5.15	0.03
			0'			1/2" Ice	3.48	5.83	0.07
			2'			1" Ice	3.88	6.52	0.11
						2" Ice	4.76	7.96	0.22
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00	0.0000	126'	No Ice	6.66	11.09	0.55
			0'			1/2" Ice	4.90	4.92	0.03
			2'			1" Ice	5.35	5.60	0.08
						2" Ice	5.80	6.28	0.13
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00	0.0000	126'	No Ice	6.73	7.71	0.26
			0'			1" Ice	8.73	10.83	0.62
			2'			2" Ice	8.73	10.83	0.62
						4" Ice	8.73	10.83	0.62
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00	0.0000	126'	No Ice	3.57	3.42	0.04
			0'			1/2" Ice	3.98	4.12	0.07
			2'			1" Ice	4.39	4.78	0.11
						2" Ice	5.33	6.16	0.21
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00	0.0000	126'	No Ice	7.34	9.18	0.52
			0'			1/2" Ice	3.57	3.42	0.04
			2'			1" Ice	3.98	4.12	0.07
						2" Ice	4.39	4.78	0.11
P65.16.XL.2 w/ Mount Pipe	C	From Leg	4.00	0.0000	126'	No Ice	5.33	6.16	0.21
			0'			1" Ice	7.34	9.18	0.52
			2'			2" Ice	7.34	9.18	0.52
						4" Ice	7.34	9.18	0.52
GPS_A	B	From Leg	4.00	0.0000	126'	No Ice	8.64	5.78	0.06
			0'			1/2" Ice	9.29	6.95	0.12
			4'			1" Ice	9.91	7.83	0.19
						2" Ice	11.18	9.63	0.36
RRH2X40-AWS	A	From Leg	4.00	0.0000	126'	No Ice	13.83	13.44	0.84
			0'			1" Ice	0.30	0.30	0.00
			4'			1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
RRH2X40-AWS	B	From Leg	4.00	0.0000	126'	No Ice	0.65	0.65	0.02
			0'			1" Ice	1.15	1.15	0.08
			2'			2" Ice	1.15	1.15	0.08
						4" Ice	1.15	1.15	0.08
RRH2X40-AWS	C	From Leg	4.00	0.0000	126'	No Ice	2.52	1.59	0.04
			0'			1/2" Ice	2.75	1.80	0.06
			2'			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
RRH2X40-AWS	A	From Leg	4.00	0.0000	126'	No Ice	4.61	3.48	0.28
			0'			1" Ice	4.61	3.48	0.28
			2'			2" Ice	4.61	3.48	0.28
						4" Ice	4.61	3.48	0.28
RRH2X40-AWS	B	From Leg	4.00	0.0000	126'	No Ice	2.52	1.59	0.04
			0'			1/2" Ice	2.75	1.80	0.06
			2'			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
RRH2X40-AWS	C	From Leg	4.00	0.0000	126'	No Ice	4.61	3.48	0.28
			0'			1" Ice	4.61	3.48	0.28
			2'			2" Ice	4.61	3.48	0.28
						4" Ice	4.61	3.48	0.28
RRH2X40-AWS	A	From Leg	4.00	0.0000	126'	No Ice	2.52	1.59	0.04
			0'			1/2" Ice	2.75	1.80	0.06
			2'			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						°
				Vert						
				ft						
				ft						
				ft						
				2'						
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	126'	1" Ice	2.99	2.01	0.08
							2" Ice	3.50	2.46	0.13
							4" Ice	4.61	3.48	0.28
							No Ice	3.57	3.42	0.03
							1/2" Ice	3.98	4.12	0.07
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	126'	1" Ice	4.39	4.78	0.11
							2" Ice	5.33	6.16	0.21
							4" Ice	7.34	9.18	0.52
							No Ice	3.57	3.42	0.03
							1/2" Ice	3.98	4.12	0.07
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	126'	1" Ice	4.39	4.78	0.11
							2" Ice	5.33	6.16	0.21
							4" Ice	7.34	9.18	0.52
							No Ice	3.57	3.42	0.03
							1/2" Ice	3.98	4.12	0.07
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0'	0.0000	126'	1" Ice	4.39	4.78	0.11
							2" Ice	5.33	6.16	0.21
							4" Ice	7.34	9.18	0.52
							No Ice	5.60	2.33	0.04
							1/2" Ice	5.92	2.56	0.08
Sector Mount [SM 411-3]	C	None	4.00	0'	0.0000	126'	1" Ice	6.24	2.79	0.12
							2" Ice	6.91	3.28	0.21
							4" Ice	8.37	4.37	0.45
							No Ice	21.88	21.88	1.07
							1/2" Ice	30.68	30.68	1.48
800 10504 w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	112'	1" Ice	39.48	39.48	1.90
							2" Ice	57.08	57.08	2.73
							4" Ice	92.28	92.28	4.40
							No Ice	3.59	3.18	0.04
							1/2" Ice	4.01	3.91	0.07
800 10504 w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	112'	1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
							No Ice	3.59	3.18	0.04
							1/2" Ice	4.01	3.91	0.07
800 10504 w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	112'	1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
							No Ice	3.59	3.18	0.04
							1/2" Ice	4.01	3.91	0.07
Empty Mount Pipe	A	From Leg	4.00	0'	0.0000	112'	1" Ice	4.42	4.58	0.11
							2" Ice	5.34	5.98	0.21
							4" Ice	7.38	8.98	0.51
							No Ice	1.40	1.40	0.03
							1/2" Ice	2.13	2.13	0.04
Empty Mount Pipe	B	From Leg	4.00	0'	0.0000	112'	1" Ice	2.68	2.68	0.06
							2" Ice	3.56	3.56	0.10
							4" Ice	5.42	5.42	0.26
							No Ice	1.40	1.40	0.03
							1/2" Ice	2.13	2.13	0.04
Empty Mount Pipe	C	From Leg	4.00	0'	0.0000	112'	1" Ice	2.68	2.68	0.06
							2" Ice	3.56	3.56	0.10
							4" Ice	5.42	5.42	0.26
							No Ice	1.40	1.40	0.03
							1/2" Ice	2.13	2.13	0.04
				0'						
				0'						
				0'						

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
(2) RRUS-11	B	From Leg	1.00	0.0000	102'	4" Ice	5.02	2.82	0.30
						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
(2) RRUS-11	C	From Leg	1.00	0.0000	102'	4" Ice	5.02	2.82	0.30
						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
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	1.00	0.0000	102'	4" Ice	5.02	2.82	0.30
						No Ice	8.64	6.36	0.08
						1/2" Ice	9.29	7.54	0.14
						1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	1.00	0.0000	102'	4" Ice	13.83	14.10	0.89
						No Ice	8.64	6.36	0.08
						1/2" Ice	9.29	7.54	0.14
						1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	1.00	0.0000	102'	4" Ice	13.83	14.10	0.89
						No Ice	8.64	6.36	0.08
						1/2" Ice	9.29	7.54	0.14
						1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
DC6-48-60-18-8F	B	From Leg	1.00	0.0000	102'	4" Ice	13.83	14.10	0.89
						No Ice	2.57	4.32	0.03
						1/2" Ice	2.80	4.60	0.06
						1" Ice	3.04	4.88	0.10
						2" Ice	3.54	5.49	0.18
Empty Mount Pipe	A	From Leg	1.00	0.0000	102'	4" Ice	4.66	6.80	0.40
						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
Empty Mount Pipe	B	From Leg	1.00	0.0000	102'	4" Ice	5.42	5.42	0.26
						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
Empty Mount Pipe	C	From Leg	1.00	0.0000	102'	4" Ice	5.42	5.42	0.26
						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
Sector Mount [SM 301-3]	C	None	0.0000	102'	4" Ice	5.42	5.42	0.26	
					No Ice	29.61	1.00	1.30	
					1/2" Ice	39.80	1.20	1.84	
					1" Ice	49.99	1.40	2.38	
					2" Ice	70.37	1.80	3.46	
* GPS_A	B	From Leg	2.00	0.0000	30'	4" Ice	111.13	2.60	5.63
						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

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
GPS_A	C	From Leg	2.00	0.0000	30'	No Ice	0.30	0.30	0.00
			0'			1/2" Ice	0.37	0.37	0.00
			0'			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	0.0000	30'	No Ice	0.85	1.67	0.07
			0'			1/2" Ice	1.14	2.34	0.08
			0'			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	0.0000	30'	No Ice	0.85	1.67	0.07
			0'			1/2" Ice	1.14	2.34	0.08
			0'			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	0.0000	12'	No Ice	0.13	0.13	0.00
			0'			1/2" Ice	0.22	0.22	0.00
			0'			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	0.0000	12'	No Ice	0.30	0.30	0.00
			0'			1/2" Ice	0.37	0.37	0.00
			0'			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	0.0000	12'	No Ice	3.00	0.90	0.07
			0'			1/2" Ice	3.74	1.12	0.08
			0'			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:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral						
			ft	ft	°	°	ft	ft	ft ²	K	
VHLP2-18	A	Paraboloid w/Shroud (HP)	From Leg	1.00	-10.0000	157'	2.17	No Ice	3.72	0.03	
				0'				1/2" Ice	4.01	0.05	
				0'				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	-40.0000	157'	2.17	No Ice	3.72	0.03	
				0'				1/2" Ice	4.01	0.05	
				0'				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	

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

*

Tower Pressures - No Ice

$$G_H = 1.121$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _d A _A In Face	C _d A _S Out Face
ft	ft		ksf	ft ²		ft ²	ft ²	ft ²		ft ²	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

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$$G_H = 1.121$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		ksf	in	ft ²	e	ft ²	ft ²	ft ²			
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"-14'6"-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	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		ksf	ft ²	e	ft ²	ft ²	ft ²			
T1 180'-160'	170'	1.597	0	160.320	A	15.113	29.508	11.688	26.19	0.000	0.000
T2 160'-153'3-31/32"	156'8-1/32'	1.561	0	63.206	B	14.117	12.313		44.22	0.000	0.000
					C	14.117	12.313	44.22	0.000	0.000	
					A	6.120	15.263	5.009	23.42	0.000	0.000
T3	150'	1.541	0	67.816	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

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Section Elevation ft	z ft	K _Z	q _z ksf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
153'3-31/32"-1 46'8-1/32" T4	143'3-31/3 2"	1.521	0	72.425	B	6.262	5.217		43.64	0.000	0.000
C					6.262	5.217		43.64	0.000	0.000	
A					8.488	16.491	5.009	20.05	0.000	0.000	
146'8-1/32"-14 0"	130'	1.48	0	246.784	B	6.622	5.217		42.31	0.000	0.000
C					6.622	5.217		42.31	0.000	0.000	
A					22.616	61.127	18.577	22.18	0.000	0.000	
T5 140'-120'	110'	1.411	0	288.763	B	16.385	19.202		52.20	0.000	0.000
C					19.546	46.310		28.21	0.000	0.000	
A					27.674	66.668	22.118	23.44	0.000	0.000	
T6 120'-100'	90'	1.332	0	329.495	B	24.123	35.613		37.03	0.000	0.000
C					26.946	76.050		21.47	0.000	0.000	
A					27.421	66.675	22.125	23.51	0.000	0.000	
T7 100'-80'	75'	1.264	0	182.118	B	24.471	42.550		33.01	0.000	0.000
C					24.973	102.817		17.31	0.000	0.000	
A					14.495	36.674	14.399	28.14	0.000	0.000	
T8 80'-70'	65'	1.214	0	192.171	B	12.995	24.612		38.29	0.000	0.000
C					13.302	54.745		21.16	0.000	0.000	
A					14.982	36.674	14.399	27.88	0.000	0.000	
T9 70'-60'	50'	1.126	0	414.393	B	13.468	24.612		37.81	0.000	0.000
C					13.804	54.745		21.01	0.000	0.000	
A					34.680	73.348	28.798	26.66	0.000	0.000	
T10 60'-40'	30'	1	0	454.393	B	31.898	49.223		35.50	0.000	0.000
C					32.032	109.490		20.35	0.000	0.000	
A					37.177	73.348	28.798	26.06	0.000	0.000	
T11 40'-20'	10'	1	0	494.393	B	34.356	49.223		34.46	0.000	0.000
C					34.499	110.540		19.86	0.000	0.000	
A					39.642	74.038	28.798	25.33	0.000	0.000	
T12 20'-0'					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	F a c e	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	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"-1 40'	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				

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	klf	
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	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	klf	
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			

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Section Elevation	Add Weight	Self Weight	Face	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
T12 20'-0'	2.45	7.71	C	0.319	2.246	0.622	0.8	1	96.350			
			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	Add Weight	Self Weight	Face	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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		

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Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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"-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			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
146'8"-1/32"			C	0.28	2.351	0.61	0.8	I	12.937			
T4	0.56	1.24	A	0.526	1.869	0.711	0.8	I	29.402	0.34	0.05	A
146'8"-1/32"-1			B	0.27	2.378	0.607	0.8	I	13.334			
40'			C	0.27	2.378	0.607	0.8	I	13.334			
T5 140'-120'	3.42	3.80	A	0.538	1.856	0.717	0.8	I	102.371	1.14	0.06	A
			B	0.224	2.517	0.596	0.8	I	36.722			
			C	0.411	2.042	0.656	0.8	I	75.983			
T6 120'-100'	5.53	4.65	A	0.51	1.888	0.703	0.8	I	112.233	1.28	0.06	C
			B	0.301	2.293	0.616	0.8	I	61.601			
			C	0.536	1.858	0.716	0.8	I	120.687			
T7 100'-80'	6.67	4.77	A	0.443	1.984	0.67	0.8	I	109.156	1.52	0.08	C
			B	0.29	2.322	0.613	0.8	I	68.552			
			C	0.598	1.805	0.752	0.8	I	155.897			
T8 80'-70'	3.30	2.65	A	0.424	2.018	0.662	0.8	I	57.175	0.76	0.08	C
			B	0.286	2.334	0.612	0.8	I	36.981			
			C	0.565	1.83	0.733	0.8	I	80.492			
T9 70'-60'	3.27	3.78	A	0.405	2.055	0.654	0.8	I	57.237	0.73	0.07	C
			B	0.274	2.368	0.608	0.8	I	37.293			
			C	0.538	1.855	0.718	0.8	I	80.354			
T10 60'-40'	6.45	5.88	A	0.385	2.094	0.646	0.8	I	117.186	1.40	0.07	C
			B	0.266	2.39	0.606	0.8	I	78.368			
			C	0.508	1.889	0.702	0.8	I	162.534			
T11 40'-20'	6.33	7.10	A	0.356	2.158	0.635	0.8	I	117.975	1.30	0.06	C
			B	0.248	2.444	0.601	0.8	I	79.999			
			C	0.474	1.936	0.685	0.8	I	164.836			
T12 20'-0'	6.37	10.91	A	0.339	2.198	0.629	0.8	I	121.705	1.35	0.07	C
			B	0.235	2.484	0.598	0.8	I	82.386			
			C	0.448	1.976	0.672	0.8	I	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	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
T1 180'-160'	0.79	2.61	A	0.437	1.996	0.667	0.85	I	54.187	0.70	0.04	A
			B	0.297	2.305	0.615	0.85	I	33.117			
			C	0.297	2.305	0.615	0.85	I	33.117			
T2	0.49	1.02	A	0.507	1.892	0.701	0.85	I	25.551	0.31	0.05	A
160'-153'3"-31/32"			B	0.25	2.438	0.602	0.85	I	10.779			
			C	0.25	2.438	0.602	0.85	I	10.779			
T3	0.54	1.20	A	0.529	1.866	0.712	0.85	I	28.781	0.34	0.05	A
153'3"-31/32"-146'8"-1/32"			B	0.28	2.351	0.61	0.85	I	13.250			
			C	0.28	2.351	0.61	0.85	I	13.250			
T4	0.56	1.24	A	0.526	1.869	0.711	0.85	I	30.511	0.35	0.05	A
146'8"-1/32"-140'			B	0.27	2.378	0.607	0.85	I	13.665			
			C	0.27	2.378	0.607	0.85	I	13.665			
T5 140'-120'	3.42	3.80	A	0.538	1.856	0.717	0.85	I	106.025	1.18	0.06	A
			B	0.224	2.517	0.596	0.85	I	37.541			
			C	0.411	2.042	0.656	0.85	I	78.967			
T6 120'-100'	5.53	4.65	A	0.51	1.888	0.703	0.85	I	116.213	1.34	0.07	C
			B	0.301	2.293	0.616	0.85	I	63.638			
			C	0.536	1.858	0.716	0.85	I	125.898			
T7 100'-80'	6.67	4.77	A	0.443	1.984	0.67	0.85	I	113.155	1.59	0.08	C

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

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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			

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	Client	Crown Castle	Designed by	Jeffrey B. Ray

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
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		

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Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	klf	
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 _{AAC} Front ft ²	C _{AAC} 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

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _A A _c Front ft ²	C _A A _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
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.08	0'	-10'31/32"	145'	1.526	0	8.50	6.95
APXVSP18-C-A20 w/ Mount Pipe	120.0000	0.08	8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
APXVSP18-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'	-10'7-7/16"	135'	1.496	0	1.79	0.78

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _A Ac Front ft ²	C _A Ac Side ft ²
FDD_R6_RRH	120.0000	0.03	9'2-9/32"	5'3-23/32" 6"	135'	1.496	0	1.79	0.78
FDD_R6_RRH	240.0000	0.03	-9'2-9/32"	5'3-23/32" 6"	135'	1.496	0	1.79	0.78
Pipe Mount [PM 601-1]	0.0000	0.07	0'	-10'7-7/16" 6"	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" 6"	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" 6"	128'	1.473	0	8.57	7.00
DB844G65ZAXY w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/16" 6"	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" 6"	128'	1.473	0	6.21	10.31
DB844G65ZAXY w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32" 6"	128'	1.473	0	9.81	9.84
MG D3-800TV w/ Mount Pipe	0.0000	0.04	0'	-11'1-3/16" 6"	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" 6"	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" 6"	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" 6"	128'	1.473	0	8.64	5.78
GPS_A	120.0000	0.00	9'7-5/16"	5'6-19/32" 6"	130'	1.480	0	0.30	0.30
RRH2X40-AWS	0.0000	0.04	0'	-11'1-3/16" 6"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	120.0000	0.04	9'7-5/16"	5'6-19/32" 6"	128'	1.473	0	2.52	1.59
RRH2X40-AWS	240.0000	0.04	-9'7-5/16"	5'6-19/32" 6"	128'	1.473	0	2.52	1.59
MG D3-800Tx w/ Mount Pipe	0.0000	0.03	0'	-11'1-3/16" 6"	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" 6"	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" 6"	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" 6"	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" 2"	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" 2"	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" 2"	112'	1.418	0	3.59	3.18
Empty Mount Pipe	0.0000	0.03	0'	-11'10-13/16" 2"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	120.0000	0.03	10'3-23/32"	5'11-13/32" 2"	112'	1.418	0	1.40	1.40
Empty Mount Pipe	240.0000	0.03	-10'3-23/32"	5'11-13/32" 2"	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" 2"	102'	1.380	0	12.24	8.51

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	Client Crown Castle	Designed by Jeffrey B. Ray

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _y ft	z ft	K _z	q _z ksf	C _{AAC} Front ft ²	C _{AAC} 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 _y ft	z ft	K _z	q _z ksf	C _{AAC} Front ft ²	C _{AAC} Side ft ²	t _z in
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	Client	Crown Castle	Designed by	Jeffrey B. Ray

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _y ft	z ft	K _z	q _z ksf	C _{Ac} Front ft ²	C _{Ac} 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
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.21	0'	-10'31/32"	145'	1.526	0	9.64	8.83	0.8943
APXVSP18-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
APXVSP18-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

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	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 _{AAc} Front ft ²	C _{AAc} 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.XL2 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	10'3-23/32"	5'11-13/32"	112'	1.418	0	2.53	2.53	0.8685

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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 _{AC} Front ft ²	C _{AC} 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
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.08	0'	-10'31/32"	145'	1.526	0	8.50	6.95
APXVSP18-C-A20 w/ Mount Pipe	120.0000	0.08	8'8-3/4"	5'15/32"	145'	1.526	0	8.50	6.95
APXVSP18-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

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	Client Crown Castle	Designed by Jeffrey B. Ray

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _y ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Pipe LLPX310R w/ Mount	120.0000	0.05	9'2-9/32"	5'3-23/32" 6"	135'	1.496	0	5.07	2.98
Pipe LLPX310R w/ Mount	240.0000	0.05	-9'2-9/32"	5'3-23/32"	135'	1.496	0	5.07	2.98
Pipe DB844H90-XY w/ Mount Pipe	0.0000	0.09	0'	-10'7-7/1 6"	135'	1.496	0	9.31	15.46
Pipe 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
Pipe 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
Pipe FDD_R6_RRH	0.0000	0.03	0'	-10'7-7/1 6"	135'	1.496	0	1.79	0.78
Pipe FDD_R6_RRH	120.0000	0.03	9'2-9/32"	5'3-23/32"	135'	1.496	0	1.79	0.78
Pipe 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'	-10'7-7/1 6"	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
Pipe LNX-6514DS-T4M w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/1 6"	128'	1.473	0	8.57	7.00
Pipe 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
Pipe DB844G65ZAXY w/ Mount Pipe	0.0000	0.06	0'	-11'1-3/1 6"	128'	1.473	0	9.81	9.84
Pipe 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
Pipe DB844G65ZAXY w/ Mount Pipe	240.0000	0.06	-9'7-5/16"	5'6-19/32"	128'	1.473	0	9.81	9.84
Pipe MG D3-800TV w/ Mount Pipe	0.0000	0.04	0'	-11'1-3/1 6"	128'	1.473	0	3.57	3.42
Pipe 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
Pipe 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
Pipe 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
Pipe GPS_A	120.0000	0.00	9'7-5/16"	5'6-19/32"	130'	1.480	0	0.30	0.30
Pipe RRH2X40-AWS	0.0000	0.04	0'	-11'1-3/1 6"	128'	1.473	0	2.52	1.59
Pipe RRH2X40-AWS	120.0000	0.04	9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
Pipe RRH2X40-AWS	240.0000	0.04	-9'7-5/16"	5'6-19/32"	128'	1.473	0	2.52	1.59
Pipe MG D3-800Tx w/ Mount Pipe	0.0000	0.03	0'	-11'1-3/1 6"	128'	1.473	0	3.57	3.42
Pipe 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
Pipe 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
Pipe 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
Pipe 800 10504 w/ Mount Pipe	0.0000	0.04	0'	-11'10-13 /16"	112'	1.418	0	3.59	3.18
Pipe 800 10504 w/ Mount Pipe	120.0000	0.04	10'3-23/3 2"	5'11-13/3 2"	112'	1.418	0	3.59	3.18

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Description	Aiming Azimuth °	Weight K	Offset _x		z ft	K _z	q _z ksf	C _{AAC} Front ft ²	C _{AAC} Side ft ²
			ft	ft					
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	11'10-7/6"	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

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
		11.52	32"						
	Sum Weight:								

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'-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'-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'-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					
Total Weight	59.57			55.82	9.39	9.39

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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

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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

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T3	153.333 - 146.667	Leg	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
			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
			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
T4	146.667 - 140	Leg	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
			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
			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			
T5	140 - 120	Leg	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
			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
			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			
T6	120 - 100	Leg	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
			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

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
T7	100 - 80	Diagonal	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			
			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			
		Leg	Max. Vy	21	0.05	0.08	-0.01			
			Max. Vx	19	-0.00	0.00	0.00			
			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			
Diagonal	Max. Vx	6	-0.16	-0.13	-0.60					
	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			
Max. Tension				5	10.19	0.00	0.00			
Diagonal			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			
Max. Tension	5	10.98				0.00	0.00			
Diagonal	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			
Max. Tension			5	11.44		0.00	0.00			
Diagonal			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			

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft		
T12	20 - 0	Diagonal	Max. Vy	17	0.99	-5.89	-0.03		
			Max. Vx	7	-0.17	-0.17	-1.16		
			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		
		Leg	Max. Vy	21	0.10	0.27	0.03		
			Max. Vx	19	0.01	0.00	0.00		
			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		
		Diagonal	Max. Vy	17	-1.17	-5.89	-0.03		
			Max. Vx	7	-0.36	-0.23	-2.35		
			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

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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			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
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%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
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

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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

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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

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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
T6	120	Diagonal	A325X	0.6250	1	6.28	6.80	0.924	1.333	Member Bearing
		Leg	A325X	1.0000	6	11.06	34.56	0.320	1.333	Bolt Tension
T7	100	Diagonal	A325X	0.6250	1	7.78	7.62	1.021	1.333	Member Bearing
		Leg	A325X	1.0000	8	11.93	34.56	0.345	1.333	Bolt Tension
T8	80	Diagonal	A325X	0.7500	1	9.81	9.14	1.073	1.333	Member Bearing
T9	70	Diagonal	A325X	0.7500	1	10.19	9.14	1.115	1.333	Member Bearing
		Leg	A325X	1.0000	8	15.86	34.56	0.459	1.333	Bolt Tension
T10	60	Diagonal	A325X	0.7500	1	10.98	12.91	0.850	1.333	Gusset Bearing
		Leg	A325X	1.0000	8	19.71	34.56	0.570	1.333	Bolt Tension
T11	40	Diagonal	A325X	0.7500	1	11.44	9.14	1.251	1.333	Member Bearing
		Leg	A325X	1.0000	8	23.42	34.56	0.678	1.333	Bolt Tension
T12	20	Diagonal	A325X	0.7500	1	12.10	11.43	1.059	1.333	Member Bearing
		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 P P _a
T1	180 - 160	ROHN 3 EH	20'15/32"	5'1/8"	52.9	23.893	3.0159	-8.01	72.06	0.111
					K=1.00					
T2	160 - 153.333	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	23.671	4.4074	-11.85	104.33	0.114
					K=1.00					
T3	153.333 - 146.667	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	23.671	4.4074	-16.86	104.33	0.162
					K=1.00					
T4	146.667 - 140	ROHN 4 EH	6'8-5/32"	6'8-5/32"	54.3	23.671	4.4074	-22.95	104.33	0.220
					K=1.00					
T5	140 - 120	ROHN 5 EH	20'15/32"	6'8-5/32"	43.6	25.320	6.1120	-49.59	154.75	0.320
					K=1.00					
T6	120 - 100	ROHN 6 EHS	20'3/8"	6'8-5/32"	36.0	26.380	6.7133	-84.25	177.09	0.476
					K=1.00					
T7	100 - 80	ROHN 6 EH	20'15/32"	10'1/4"	54.8	23.589	8.4049	-118.64	198.26	0.598
					K=1.00					
T8	80 - 70	ROHN 8 EHS	10'1/4"	10'1/4"	41.2	25.667	9.7193	-136.76	249.47	0.548
					K=1.00					
T9	70 - 60	ROHN 8 EHS	10'1/4"	10'1/4"	41.2	25.667	9.7193	-155.28	249.47	0.622
					K=1.00					
T10	60 - 40	ROHN 8 EHS	20'3/8"	10'1/4"	41.2	25.667	9.7193	-191.70	249.47	0.768
					K=1.00					
T11	40 - 20	ROHN 8 EH	20'3/8"	10'1/4"	41.8	25.582	12.7627	-227.66	326.50	0.697
					K=1.00					
T12	20 - 0	ROHN 8 EH	20'3/8"	10'1/4"	41.8	25.582	12.7627	-263.43	326.50	0.807
					K=1.00					

Diagonal Design Data (Compression)

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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 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 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

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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 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 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

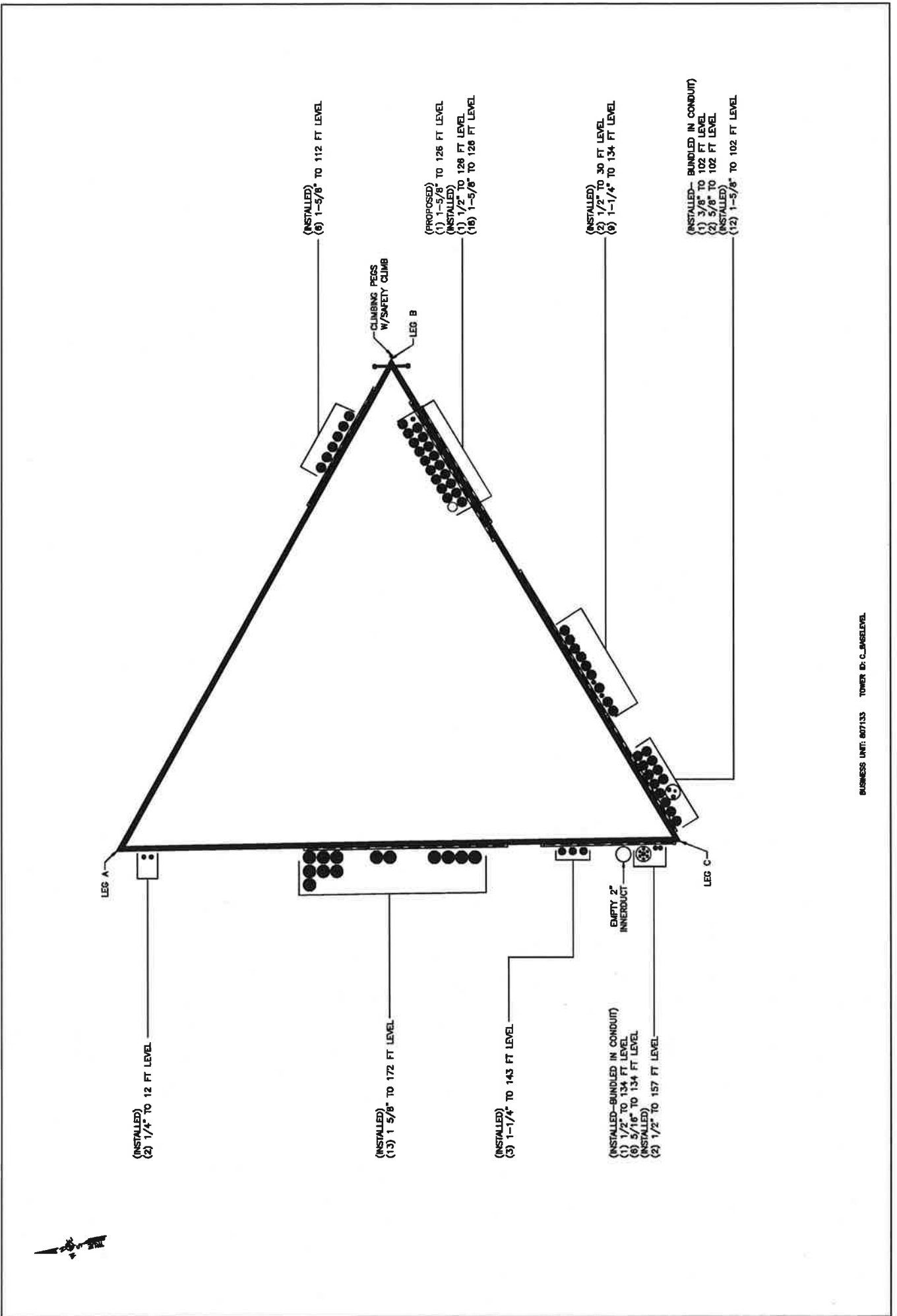
Section Capacity Table

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	Pass
T2	160 - 153.333	Diagonal	L2 1/2x2 1/2x1/4	42	-2.27	13.09	17.3	Pass
T3	153.333 - 146.667	Diagonal	L2 1/2x2 1/2x1/4	54	-2.60	11.83	24.2 (b) 21.9	Pass
T4	146.667 - 140	Diagonal	L2 1/2x2 1/2x1/4	66	-3.15	10.74	27.4 (b) 29.3	Pass
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	75	-6.31	8.26	34.1 (b) 76.4	Pass
T6	120 - 100	Diagonal	L3x3x1/4	95	-7.81	11.62	67.2	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	113	-9.79	12.51	76.6 (b) 78.3	Pass
T8	80 - 70	Diagonal	L3 1/2x3 1/2x1/4	128	-10.37	11.68	80.5 (b) 88.8	Pass
T9	70 - 60	Diagonal	2L3 1/2x3 1/2x1/4x3/8	137	-11.19	17.97	62.3	Pass
T10	60 - 40	Diagonal	L4x4x1/4	146	-11.77	13.64	63.8 (b) 86.3	Pass
							93.9 (b)	

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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

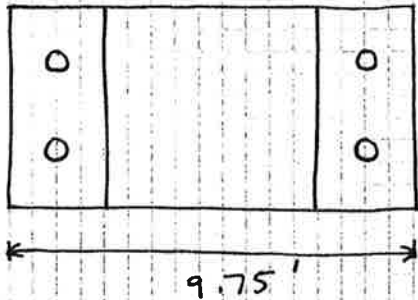
APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS



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



TNK Reactions
uplift = 222
Down = 272

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

Compression

ultimate Bearing Capacity = 30 ksf per Geo

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

$$\text{total down load} = 272 \text{ k} + 82.27 \text{ k} = 354.27$$

$$\text{Actual Bearing stress} = \frac{354.27 \text{ k}}{60.9375 \text{ ft}^2} = 5.81 \text{ ksf}$$

$$\text{Capacity} = 5.81 \text{ ksf} / (0.5 \times 30 \text{ ksf})$$

$$= \underline{38.8\%}$$



Project: _____
 Sheet _____ of _____
 By: _____
 Checked By: _____

Date: _____
 FDH Project #: _____
 Drawing #: _____

Uplift Anchor = #11 BAR A615 Gr 60

Tensile strength of BAR

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

$$P_u = 222 \text{ k} / 4 = 55.5 \text{ k}$$

$$\text{Capacity} = 55.5 / 56.1 = 98.9\%$$

Soil-grout interaction

ultimate skin friction = 16.0 ksf

$$\frac{P_N}{\Omega} = \frac{\pi (2.25'' \times \frac{1}{12}'') (15.5') (16 \text{ ksf})}{2} = 73.04 \text{ k}$$

$$P_u = 222 \text{ k} / 4 = 55.5 \text{ k}$$

$$\text{Capacity} = 55.5 \text{ k} / 73.04 \text{ k} = 76.0\%$$