ROBINSON & COLE LLP

KENNETH C. BALDWIN

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Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

February 20, 2014

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

Re: **Notice of Exempt Modification – Antenna Swap**
400 Reily Mountain Road, Coventry, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) wireless telecommunications antennas at the 127-foot level of the existing 152-foot tower at 400 Reily Mountain Road in Coventry, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of the tower in 2005. Cellco now intends to replace six (6) of its existing antennas with three (3) model 742 213V01, 1900 MHz antennas and three (3) model 742 213V01, 2100 MHz antennas, all at the 127-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 inside the monopole. Included in Attachment 1 are specifications for Cellco's replacement 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 John Elsesser, Town Manager for the Town of Coventry. A copy of this letter is also being sent to James and Concetta Wallbeoff, Trustees, the record owner of the Property.

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 replaced antennas and RRHs will be located on Cellco's existing platform at the 127-foot level on the tower.

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state 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 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:
John Elsesser, Coventry Town Manager
James and Concetta Wallbeoff
Sandy M. Carter

ATTACHMENT 1

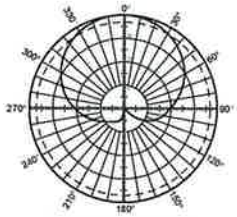
KATHREIN
SCALA DIVISION

742 213V01

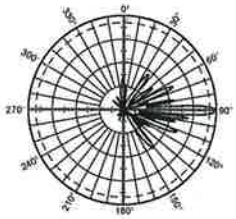
65° Panel Antenna

Kathrein's X-polarized adjustable electrical downtilt antennas offer the wireless carrier the ability to tailor polarization diversity sites for optimum performance. Using variable downtilt, only a few models need be procured to accommodate the needs of widely varying conditions. Remotely controlled downtilt is available as a retrofitable option.

- 0-6° downtilt range.
- UV resistant pulltruded fiberglass radome.
- DC Grounded metallic parts for impulse suppression.
- No moving electrical connections.
- Wideband vector dipole technology.
- Optional remote downtilt Control.
- Will accomodate future 3G / UMTS applications.



Horizontal pattern
±45°- polarization



Vertical pattern
±45°- polarization
0°–6° electrical downtilt

General specifications:

Frequency range	1710–2200 MHz
VSWR	< 1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Front-to-back ratio (180°±30°)	>30 dB (co-polar) >25 dB (total power)
Maximum input power	300 watts per input (at 50°C)
Electrical downtilt continuously adjustable	0–6 degrees
Connector	2 x 7-16 DIN female
Isolation	>30 dB
Cross polar ratio Main direction 0° Sector ±60°	 25 dB (typical) >10 dB
Tracking, average	0.5 dB
Squint	±2.0°
Weight	19.8 lb (9 kg) 24.3 lb (11 kg) clamps included
Dimensions	76.9 x 6.1 x 2.8 inches (1954 x 155 x 70 mm)
Wind load Front/Side/Rear Mounting category	at 93 mph (150kph) 115 lbf / 32 lbf / 115 lbf (510 N) / (140 N) / (510 N) M (Medium)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	88 x 6.8 x 3.6 inches (2235 x 172 x 92 mm)
Shipping weight	28.7 lb (13 kg)
Mounting	Fixed mounts for 2 to 4.6 inch (50 to 115 mm) OD masts are included and tilt options are available.
See reverse for order information.	

Specifications:	**1710–1880 MHz**				**1850–1990 MHz**				**1920–2200 MHz**			
Gain	19 dBi				19.2 dBi				19.5 dBi			
+45° and -45° polarization horizontal beamwidth	67° (half-power)				65° (half-power)				63° (half-power)			
+45° and -45° polarization vertical beamwidth	4.7° (half-power)				4.5° (half-power)				4.3° (half-power)			
Sidelobe suppression for first sidelobe above main beam	0° 18	2° 18	4° 16	6° T 15 dB	0° 18	2° 18	4° 17	6° T 16 dB	0° 18	2° 18	4° 18	6° T 18 dB

11271-B
936.3740/b

*Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

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

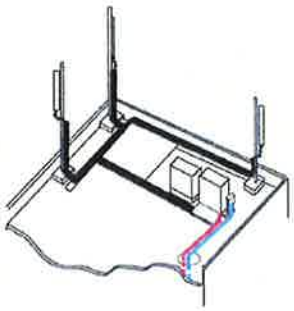
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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.

Features

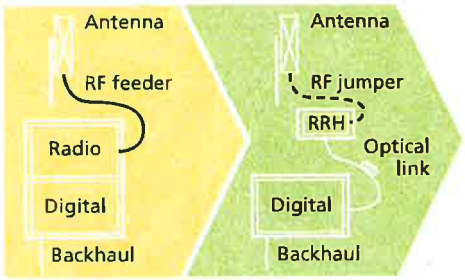
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

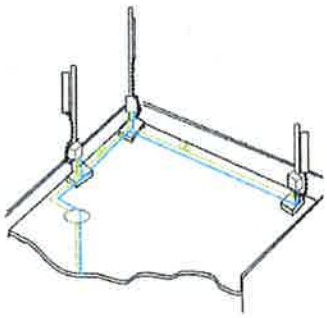
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (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

CPG2809100912 (09)

Alcatel·Lucent

Product Data Sheet **HB158-1-08U8-S8J18**

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 CELLFLEX³ accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

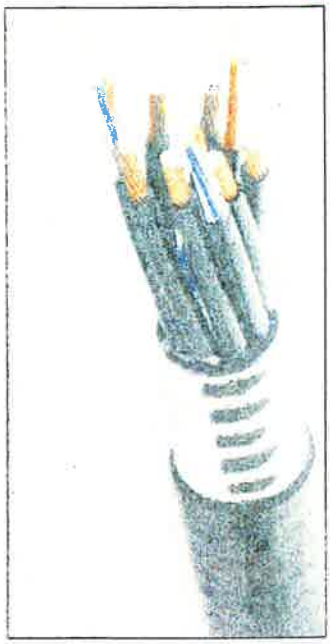


Figure 1: HYBRIFLEX Series

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

Technical Specifications

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
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)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	.068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
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)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (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 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

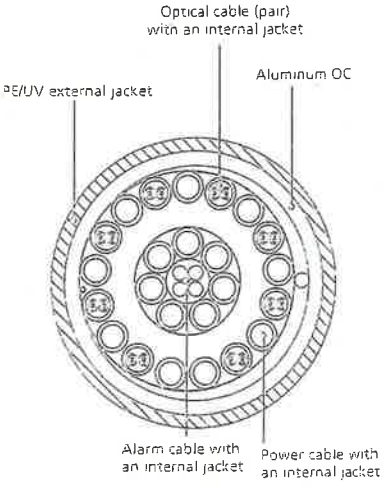


Figure 2: Construction Detail

¹ This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Coventry N								
Tower Height: Verizon @ 126ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	120	0.0282	880	0.5867	4.81%	
*AT&T UMTS	2	875	120	0.0437	1900	1.0000	4.37%	
*AT&T GSM	1	283	120	0.0071	880	0.5867	1.20%	
*AT&T GSM	4	525	120	0.0524	1900	1.0000	5.24%	
*AT&T LTE	1	1615	120	0.0403	734	0.4893	8.24%	
*Pocket (now MetroPCS)	3	631	107	0.0595	2130	1.0000	5.95%	
*Sprint	11	384	147	0.0703	1962.5	1.0000	7.03%	
*T-Mobile	8	246	137	0.0377	1935	1.0000	3.77%	
Verizon	**11**	**431**	**126**	**0.1074**	**1970**	**1.0000**	**10.74%**	
Verizon	**9**	**399**	**126**	**0.0813**	**869**	**0.5793**	**14.04%**	
Verizon	**1**	**1750**	**126**	**0.0396**	**2145**	**1.0000**	**3.96%**	
Verizon	**1**	**1050**	**126**	**0.0238**	**698**	**0.4653**	**5.11%**	
								74.46%
* Source: Siting Council								

ATTACHMENT 3

Date: **January 20, 2014**

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430

GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-2148
dpalkovic@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate** **Carrier Site Name:**	 Coventry North, CT
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	876385 N. Coventry/Wallbeoff 256673 700501 211527 Rev. 0
Engineering Firm Designation:	**GPD Group Project Number:**	2014777.876385.02
Site Data:	**Reilly Mtn. Rd., Coventry, CT 06238, Tolland County** **Latitude *41°47' 56.210"*, Longitude *-72°19' 55.880"*** **152 Foot – EEI Monopole Tower**	

Dear Veronica Harris,

GPD Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 609512, in accordance with application 211527, revision 0.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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

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

Respectfully submitted by:

John N. Kabak, P.E.
Connecticut #: 28386

1/20/2014

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 152 ft Monopole tower designed by Engineered Endeavors, Inc. in November of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

The monopole has 18 sides and is evenly tapered from 75" (flat-flat) at the base to 33.03" (flat-flat) at the top. It has four major sections connected with slip joints. The tower is galvanized and has no tower lighting.

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 mph with 1 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
124.0	126.0	3	Alcatel Lucent	RRH2x40-AWS	1	1-5/8	1
		6	Kathrein	742 213			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			

Notes: 1) See Appendix B for the proposed coax layout.

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
150.0	152.0	6	Decibel	DB980F90T2E-M	6	1-5/8	
	150.0	1	Unknown	Platform Mount [LP 601-1]			
133.0	136.0	3	EMS Wireless	RR90-17-02DP	6	1-5/8	
		6	Ericsson	KRY 112 71/2			
	133.0	1	Unknown	Platform Mount [LP 303-1]			
124.0	126.0	6	Antel	LPA-171080-12CF-EDIN-2			1
		3	Antel	BXA-70063/6CF-2	18	1-5/8	
		6	Antel	LPA-80080/6CF			
	124.0	1	Unknown	Platform Mount [LP 303-1]			
116.0	120.0	2	KMW Communications	AM-X-CD-16-65-00T-RET	12 1 2	1-1/4 3/8 3/4	
		6	Powerwave	7770.0			
		1	Powerwave	P65-17-XLH-RR			
		3	Ericsson	RRUS-11			
		6	Powerwave	LGP21401			
		6	Powerwave	LGP21903			
		1	Raycap	DC6-48-60-18-8F			
	116.0	1	Unknown	Platform Mount [LP 712-1]			
107.0	107.0	3	Kathrein	742 213	6	1-5/8	
74.0	75.0	1	Lucent	KS24019-L112A	1	1/2	
	74.0	1	Unknown	Side Arm Mount [SO 701-1]			

Notes: 1) Equipment to be removed

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)
150.0	150.0	1	Unknown	LP Platform		
		12	Dapa	48000		
140.0	140.0	1	Unknown	LP Platform		
		12	Dapa	48000		
130.0	130.0	1	Unknown	LP Platform		
		12	Dapa	48000		
120.0	120.0	1	Unknown	LP Platform		
		12	Dapa	48000		
110.0	110.0	1	Unknown	LP Platform		
		12	Dapa	48000		
100.0	100.0	1	Unknown	LP Platform		
		12	Dapa	48000		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Engineered Endeavors, Inc. Job #: 7831, dated 9/22/2000	Doc ID # 1614566	Crown DMZ
Foundation Design	Engineered Endeavors, Inc. Project #: 7831 Rev. 1, dated 9/25/2000	Doc ID # 1441268	Crown DMZ
Geotechnical Report	Goodkind & O'Dea, Inc. dated August, 2000	Doc ID # 1531969	Crown DMZ

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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.
5) Mount sizes, weights, and manufacturers are best estimates based on site photos provided and were determined without the benefit of a site visit by GPD.
6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
7) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package with any adjustments as noted below.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	152 - 137.423	Pole	TP37.31x33.03x0.3125	1	-2.43	1829.53	2.2	Pass
L2	137.423 - 91.09	Pole	TP50.15x35.1679x0.375	2	-17.35	2956.95	21.5	Pass
L3	91.09 - 44.793	Pole	TP62.86x47.4122x0.4375	3	-31.89	4329.64	31.5	Pass
L4	44.793 - 0	Pole	TP75x59.5377x0.5	4	-55.88	6146.50	34.6	Pass
							Summary	
						Pole (L4)	34.6	Pass
						Rating =	34.6	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	31.8	Pass
1	Base Plate	0	46.8	Pass
1	Base Foundation	0	32.2	Pass

Structure Rating (max from all components) =	46.8%

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

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading and do not require modifications.

5) DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

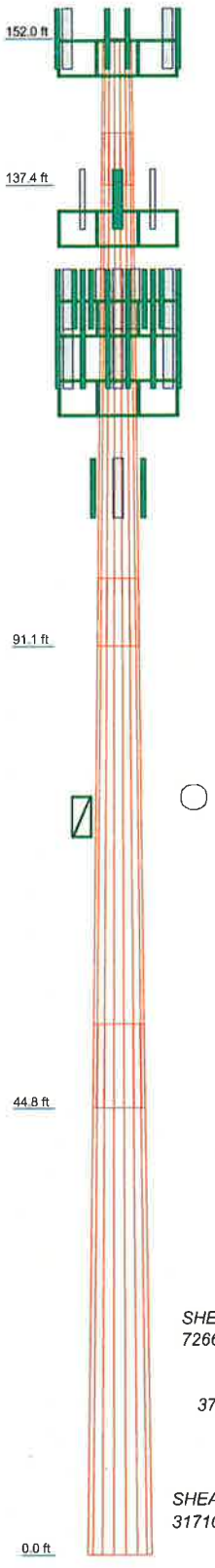
GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any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

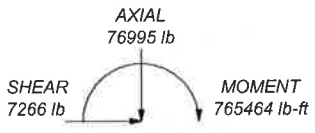
APPENDIX A

TNXTOWER OUTPUT

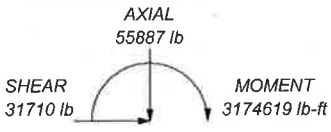
Section	1	2	3	4
Length (ft)	14.58	51.50	53.13	53.21
Number of Sides	18	18	18	16
Thickness (in)	0.3125	0.3750	0.4375	0.5000
Socket Length (ft)	5.17	6.83	8.42	
Top Dia (in)	33.0300	35.1679	47.4122	59.5377
Bot Dia (in)	37.3100	50.1500	62.8600	75.0000
Grade	A572-65			
Weight (lb)	1715.0	8819.8	13732.1	19185.8

Total Weight (lb): 43452.6





TORQUE 207 lb-ft
37 mph WIND - 1.0000 in ICE



TORQUE 804 lb-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 601-1]	150	RRH2x40-AWS	124
(2) DB980F90T2E-M w/ Mount Pipe	150	RRH2x40-AWS	124
(2) DB980F90T2E-M w/ Mount Pipe	150	RRH2x40-AWS	124
(2) DB980F90T2E-M w/ Mount Pipe	150	DB-T1-6Z-8AB-0Z	124
2.5" x 7' mount pipe	150	Platform Mount [LP 712-1]	116
2.5" x 7' mount pipe	150	AM-X-CD-16-65-00T-RET w/ Mount Pipe	116
2.5" x 7' mount pipe	150	AM-X-CD-16-65-00T-RET w/ Mount Pipe	116
Platform Mount [LP 303-1]	133	P65-17-XLH-RR w/ Mount Pipe	116
2.5" x 7' mount pipe	133	(2) 7770.00 w/ Mount Pipe	116
2.5" x 7' mount pipe	133	(2) 7770.00 w/ Mount Pipe	116
2.5" x 7' mount pipe	133	(2) 7770.00 w/ Mount Pipe	116
RR90-17-02DP w/ Mount Pipe	133	RRUS-11	116
RR90-17-02DP w/ Mount Pipe	133	RRUS-11	116
RR90-17-02DP w/ Mount Pipe	133	RRUS-11	116
(2) KRY 112 71/2	133	(2) LGP21903	116
(2) KRY 112 71/2	133	(2) LGP21903	116
(2) KRY 112 71/2	133	(2) LGP21903	116
Platform Mount [LP 303-1]	124	(2) LGP21401	116
(2) LPA-80080/6CF w/ Mount Pipe	124	(2) LGP21401	116
(2) LPA-80080/6CF w/ Mount Pipe	124	(2) LGP21401	116
(2) LPA-80080/6CF w/ Mount Pipe	124	DC6-48-60-18-8F	116
BXA-70063/6CF-2 w/ Mount Pipe	124	742 213 w/ Mount Pipe	107
BXA-70063/6CF-2 w/ Mount Pipe	124	742 213 w/ Mount Pipe	107
BXA-70063/6CF-2 w/ Mount Pipe	124	742 213 w/ Mount Pipe	107
(2) 742 213 w/ Mount Pipe	124	Side Arm Mount [SO 701-1]	74
(2) 742 213 w/ Mount Pipe	124		
(2) 742 213 w/ Mount Pipe	124		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

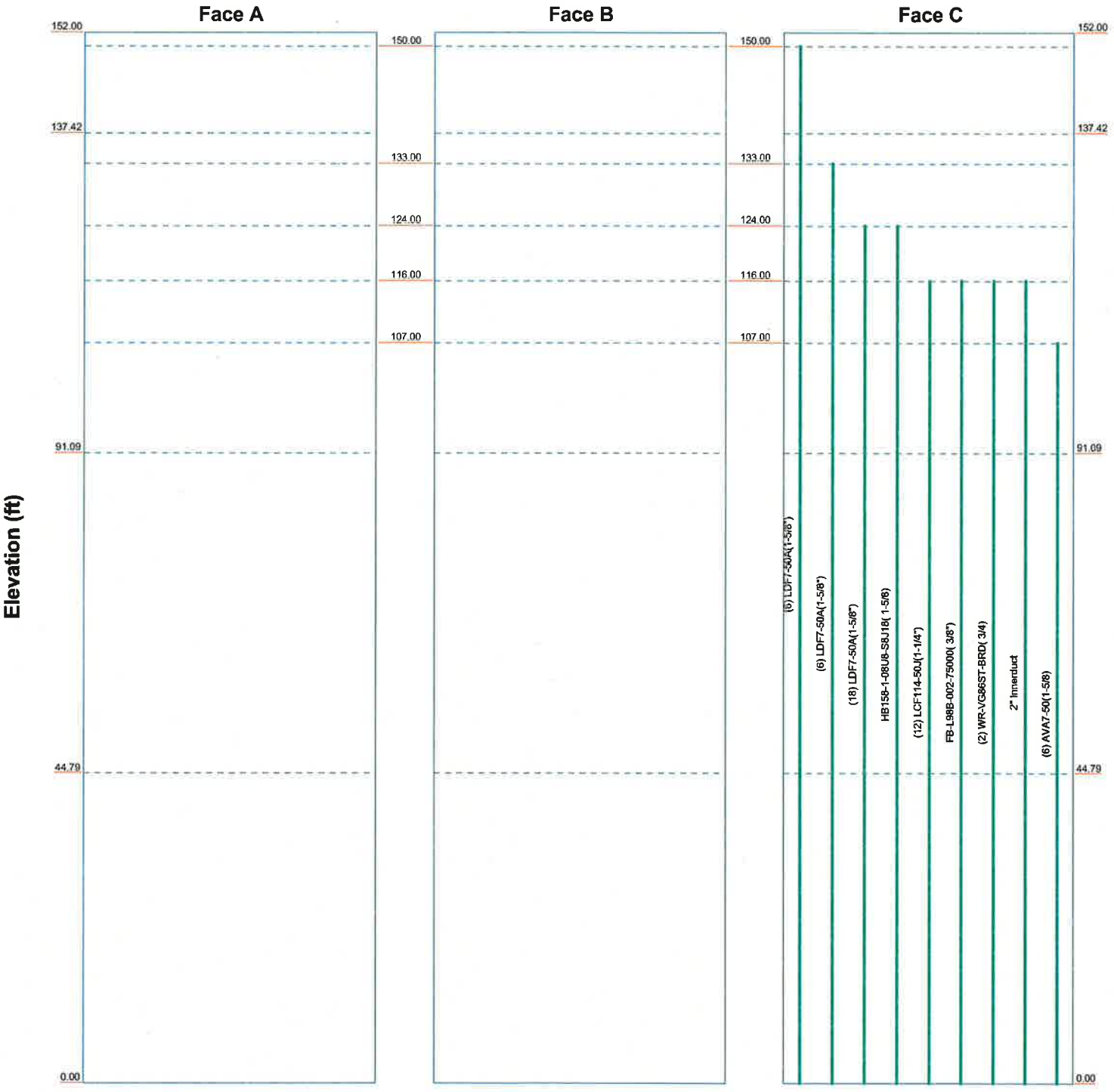
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 34.6%

GPD Group
Consulting Engineers
520 South Main Street, Suite 2531
Akron, OH 44311
Phone: (330) 572-2148
FAX: (330) 572-2101

Job: 876385 N. Coventry/Wallbeoff			
Project: 2012775.876385.02			
Client: Crown Castle USA, Inc.	Drawn by: B Darkow	App'd:	
Code: TIA/EIA-222-F	Date: 01/20/14	Scale: NTS	
Path: T:\Crown\876385\02\TNX\876385.02.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 152'

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



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Client: Crown Castle USA, Inc.	Drawn by: B Darkow	App'd:	
Code: TIA/EIA-222-F	Date: 01/20/14	Scale: NTS	
Path: T:\Crown\876385\02\TNX\876385.02.eri		Dwg No. E-7	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Tolland County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 1.0000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 37 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	152.00-137.42	14.58	5.17	18	33.0300	37.3100	0.3125	1.2500	A572-65 (65 ksi)
L2	137.42-91.09	51.50	6.83	18	35.1679	50.1500	0.3750	1.5000	A572-65 (65 ksi)
L3	91.09-44.79	53.13	8.42	18	47.4122	62.8600	0.4375	1.7500	A572-65 (65 ksi)
L4	44.79-0.00	53.21		18	59.5377	75.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	33.5395	32.4517	4388.6882	11.6147	16.7792	261.5546	8783.1512	16.2289	5.2633	16.842

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	37.8856	36.6969	6346.1675	13.1341	18.9535	334.8286	12700.6855	18.3519	6.0166	19.253
L2	37.2368	41.4122	6333.5547	12.3515	17.8653	354.5173	12675.4433	20.7101	5.5296	14.745
	50.9236	59.2447	18544.2574	17.6701	25.4762	727.9052	37112.9158	29.6280	8.1664	21.777
L3	50.1610	65.2302	18185.0269	16.6760	24.0854	755.0232	36393.9822	32.6213	7.5745	17.313
	63.8297	86.6814	42672.2855	22.1600	31.9329	1336.3118	85400.7203	43.3490	10.2934	23.528
L4	62.9398	93.6929	41257.5064	20.9584	30.2452	1364.1028	82569.3004	46.8553	9.5986	19.197
	76.1570	118.2315	82905.4718	26.4475	38.1000	2175.9966	165920.0328	59.1270	12.3200	24.64

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 152.00-137.42				1	1	1		
L2 137.42-91.09				1	1	1		
L3 91.09-44.79				1	1	1		
L4 44.79-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	150.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	Inside Pole	133.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	Inside Pole	124.00 - 0.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	124.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
LCF114-50J(1-1/4")	C	No	Inside Pole	116.00 - 0.00	12	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70
FB-L98B-002-75000(3/8")	C	No	Inside Pole	116.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	116.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	0.58
2" Innerduct	C	No	Inside Pole	116.00 - 0.00	1	No Ice	0.00	0.26
						1/2" Ice	0.00	0.26
						1" Ice	0.00	0.26
						2" Ice	0.00	0.26
						4" Ice	0.00	0.26
AVA7-50(1-5/8)	C	No	Inside Pole	107.00 - 0.00	6	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	152.00-137.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	61.88
L2	137.42-91.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1275.74
L3	91.09-44.79	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1851.17
L4	44.79-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1791.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	152.00-137.42	A	1.194	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	61.88
L2	137.42-91.09	A	1.160	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1275.74
L3	91.09-44.79	A	1.090	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1851.17
L4	44.79-0.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1791.03

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	152.00-137.42	0.0000	0.0000	0.0000	0.0000
L2	137.42-91.09	0.0000	0.0000	0.0000	0.0000
L3	91.09-44.79	0.0000	0.0000	0.0000	0.0000
L4	44.79-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Platform Mount [LP 601-1]	C	None		0.0000	150.00	No Ice	28.47	28.47	1122.00
						1/2" Ice	33.59	33.59	1513.66
						1" Ice	38.71	38.71	1905.31
						2" Ice	48.95	48.95	2688.62
						4" Ice	69.43	69.43	4255.25
(2) DB980F90T2E-M w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice	3.99	3.72	31.40
						1/2" Ice	4.45	4.58	67.64
						1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
(2) DB980F90T2E-M w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice	3.99	3.72	31.40
						1/2" Ice	4.45	4.58	67.64
						1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
(2) DB980F90T2E-M w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice	3.99	3.72	31.40
						1/2" Ice	4.45	4.58	67.64
						1" Ice	4.90	5.32	110.22
						2" Ice	5.82	6.85	217.69
						4" Ice	7.98	10.10	552.44
2.5" x 7' mount pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56
						4" Ice	7.35	7.35	130.12
2.5" x 7' mount pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56
						4" Ice	7.35	7.35	130.12
2.5" x 7' mount pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56
						4" Ice	7.35	7.35	130.12
Platform Mount [LP 303-1]	C	None		0.0000	133.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
2.5" x 7' mount pipe	A	From Centroid-Face	4.00 0.00 3.00	0.0000	133.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56
						4" Ice	7.35	7.35	130.12
2.5" x 7' mount pipe	B	From Centroid-Face	4.00 0.00 3.00	0.0000	133.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56
						4" Ice	7.35	7.35	130.12
2.5" x 7' mount pipe	C	From Centroid-Face	4.00 0.00 3.00	0.0000	133.00	No Ice	1.75	1.75	25.00
						1/2" Ice	2.45	2.45	38.14
						1" Ice	3.15	3.15	51.28
						2" Ice	4.55	4.55	77.56

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	7.35	7.35	130.12
						4" Ice			
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	71.62
						1" Ice	5.58	4.78	115.19
						2" Ice	6.59	6.23	223.87
						4" Ice	8.73	9.31	556.85
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	71.62
						1" Ice	5.58	4.78	115.19
						2" Ice	6.59	6.23	223.87
						4" Ice	8.73	9.31	556.85
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	4.59	3.32	34.18
						1/2" Ice	5.09	4.09	71.62
						1" Ice	5.58	4.78	115.19
						2" Ice	6.59	6.23	223.87
						4" Ice	8.73	9.31	556.85
(2) KRY 112 71/2	A	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) KRY 112 71/2	B	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) KRY 112 71/2	C	From Centroid-Face	4.00 / 0.00 / 3.00	0.0000	133.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
Platform Mount [LP 303-1]	C	None		0.0000	124.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(2) LPA-80080/6CF w/ Mount Pipe	A	From Centroid-Leg	4.00 / 0.00 / 2.00	0.0000	124.00	No Ice	4.35	10.51	42.90
						1/2" Ice	4.79	11.56	107.03
						1" Ice	5.25	12.49	178.83
						2" Ice	6.17	14.40	348.74
						4" Ice	8.11	18.43	824.37
(2) LPA-80080/6CF w/ Mount Pipe	B	From Centroid-Leg	4.00 / 0.00 / 2.00	0.0000	124.00	No Ice	4.35	10.51	42.90
						1/2" Ice	4.79	11.56	107.03
						1" Ice	5.25	12.49	178.83
						2" Ice	6.17	14.40	348.74
						4" Ice	8.11	18.43	824.37
(2) LPA-80080/6CF w/ Mount Pipe	C	From Centroid-Leg	4.00 / 0.00 / 2.00	0.0000	124.00	No Ice	4.35	10.51	42.90
						1/2" Ice	4.79	11.56	107.03
						1" Ice	5.25	12.49	178.83
						2" Ice	6.17	14.40	348.74
						4" Ice	8.11	18.43	824.37
BXA-70063/6CF-2 w/ Mount Pipe	A	From Centroid-Leg	4.00 / 0.00 / 2.00	0.0000	124.00	No Ice	7.73	4.94	35.25
						1/2" Ice	8.27	5.68	89.13
						1" Ice	8.81	6.44	150.30
						2" Ice	9.93	7.99	297.42
						4" Ice	12.27	11.35	717.94

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						4" Ice			
BXA-70063/6CF-2 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.73 8.27 8.81 9.93 12.27	4.94 5.68 6.44 7.99 11.35	35.25 89.13 150.30 297.42 717.94
BXA-70063/6CF-2 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.73 8.27 8.81 9.93 12.27	4.94 5.68 6.44 7.99 11.35	35.25 89.13 150.30 297.42 717.94
(2) 742 213 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
(2) 742 213 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
(2) 742 213 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
RRH2x40-AWS	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.51 2.75 2.99 3.49 4.61	1.66 1.87 2.08 2.54 3.57	44.00 61.72 82.35 133.14 278.28
RRH2x40-AWS	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.51 2.75 2.99 3.49 4.61	1.66 1.87 2.08 2.54 3.57	44.00 61.72 82.35 133.14 278.28
RRH2x40-AWS	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.51 2.75 2.99 3.49 4.61	1.66 1.87 2.08 2.54 3.57	44.00 61.72 82.35 133.14 278.28
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	44.00 80.13 120.22 213.04 454.67
Platform Mount [LP 712-1]	C	None		0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1335.00 1645.59 1956.18 2577.36 3819.72
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 139.04 211.91 384.96 874.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 139.04 211.91 384.96 874.27
P65-17-XLH-RR w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.47 12.08 12.71 14.07 17.08	8.70 10.11 11.38 13.58 18.18	88.20 171.36 264.18 482.82 1089.49
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
RRUS-11	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.19 1.35 1.52 1.89 2.72	55.00 74.32 96.56 150.56 302.12
RRUS-11	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.19 1.35 1.52 1.89 2.72	55.00 74.32 96.56 150.56 302.12
RRUS-11	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.19 1.35 1.52 1.89 2.72	55.00 74.32 96.56 150.56 302.12
(2) LGP21903	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	11.02 13.44 16.93 27.95 71.54
(2) LGP21903	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	11.02 13.44 16.93 27.95 71.54
(2) LGP21903	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	11.02 13.44 16.93 27.95 71.54
(2) LGP21401	A	From	4.00	0.0000	116.00	No Ice	1.29	0.23	14.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		Centroid-Leg	0.00 4.00			1/2" Ice 1" Ice 2" Ice 4" Ice	1.45 1.61 1.97 2.79	0.31 0.40 0.61 1.12	21.26 30.32 54.89 135.29
(2) LGP21401	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	14.10 21.26 30.32 54.89 135.29
(2) LGP21401	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	14.10 21.26 30.32 54.89 135.29
DC6-48-60-18-8F	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	2.57 2.80 3.04 3.54 4.66	18.90 41.46 67.19 128.96 299.16
742 213 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
742 213 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
742 213 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.52 6.16 6.78 7.97 10.45	4.77 6.21 7.35 9.29 13.37	51.20 97.45 151.50 287.00 705.11
Side Arm Mount [SO 701-1]	C	From Leg	2.00 0.00 0.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	65.00 79.00 93.00 121.00 177.00

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

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.423	8.492	27	0.4414	0.0004
L2	142.59 - 91.09	7.623	27	0.4393	0.0004
L3	97.923 - 44.793	3.773	27	0.3564	0.0002
L4	53.21 - 0	1.132	27	0.1912	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Platform Mount [LP 601-1]	27	8.307	0.4411	0.0004	295164
133.00	Platform Mount [LP 303-1]	27	6.745	0.4319	0.0004	61041
124.00	Platform Mount [LP 303-1]	27	5.938	0.4194	0.0004	38732
116.00	Platform Mount [LP 712-1]	27	5.241	0.4041	0.0003	29235
107.00	742 213 w/ Mount Pipe	27	4.489	0.3825	0.0003	22914
74.00	Side Arm Mount [SO 701-1]	27	2.153	0.2720	0.0001	14313

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.423	24.531	2	1.2750	0.0011
L2	142.59 - 91.09	22.022	2	1.2690	0.0011
L3	97.923 - 44.793	10.901	2	1.0298	0.0007
L4	53.21 - 0	3.270	2	0.5524	0.0002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Platform Mount [LP 601-1]	2	23.998	1.2743	0.0012	102260
133.00	Platform Mount [LP 303-1]	2	19.487	1.2476	0.0011	21160
124.00	Platform Mount [LP 303-1]	2	17.155	1.2115	0.0010	13427
116.00	Platform Mount [LP 712-1]	2	15.142	1.1673	0.0009	10134
107.00	742 213 w/ Mount Pipe	2	12.969	1.1050	0.0008	7943
74.00	Side Arm Mount [SO 701-1]	2	6.222	0.7859	0.0004	4957

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	152 - 137.423 (1)	TP37.31x33.03x0.3125	14.58	0.00	0.0	39.000	35.1921	-2428.40	1372490.00	0.002
L2	137.423 - 91.09 (2)	TP50.15x35.1679x0.375	51.50	0.00	0.0	39.000	56.8787	-17351.80	2218270.00	0.008
L3	91.09 - 44.793 (3)	TP62.86x47.4122x0.4375	53.13	0.00	0.0	39.000	83.2831	-31886.30	3248040.00	0.010
L4	44.793 - 0 (4)	TP75x59.5377x0.5	53.21	0.00	0.0	39.000	118.2310	-55879.70	4611030.00	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	152 - 137.423 (1)	TP37.31x33.03x0.3125	27289.58	1.064	39.000	0.027	0.00	0.000	39.000	0.000
L2	137.423 - 91.09 (2)	TP50.15x35.1679x0.375	606539.17	10.852	39.000	0.278	0.00	0.000	39.000	0.000
L3	91.09 - 44.793 (3)	TP62.86x47.4122x0.4375	1644375.00	16.001	39.000	0.410	0.00	0.000	39.000	0.000
L4	44.793 - 0 (4)	TP75x59.5377x0.5	3174616.67	17.507	39.000	0.449	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	152 - 137.423 (1)	TP37.31x33.03x0.3125	3634.09	0.103	26.000	0.008	0.01	0.000	26.000	0.000
L2	137.423 - 91.09 (2)	TP50.15x35.1679x0.375	20615.90	0.362	26.000	0.028	375.01	0.003	26.000	0.000

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L3	91.09 - 44.793 (3)	TP62.86x47.4122x0.4375	25809.40	0.310	26.000	0.024	618.95	0.003	26.000	0.000
L4	44.793 - 0 (4)	TP75x59.5377x0.5	31722.60	0.268	26.000	0.021	618.88	0.002	26.000	0.000

Pole Interaction Design Data

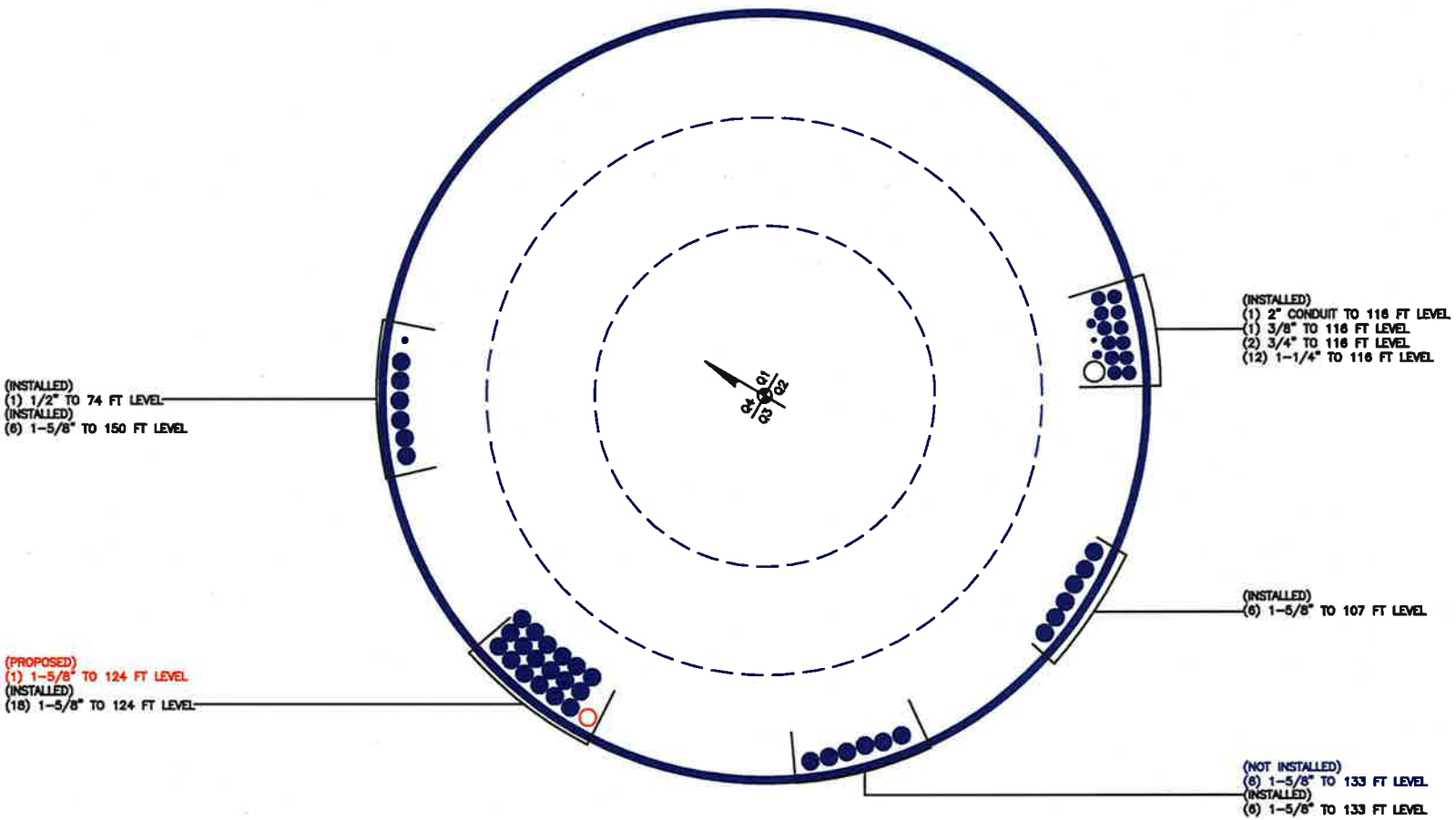
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	152 - 137.423 (1)	0.002	0.027	0.000	0.008	0.000	0.029 ✔	1.333	H1-3+VT ✔
L2	137.423 - 91.09 (2)	0.008	0.278	0.000	0.028	0.000	0.286 ✔	1.333	H1-3+VT ✔
L3	91.09 - 44.793 (3)	0.010	0.410	0.000	0.024	0.000	0.420 ✔	1.333	H1-3+VT ✔
L4	44.793 - 0 (4)	0.012	0.449	0.000	0.021	0.000	0.461 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	152 - 137.423	Pole	TP37.31x33.03x0.3125	1	-2428.40	1829529.09	2.2	Pass
L2	137.423 - 91.09	Pole	TP50.15x35.1679x0.375	2	-17351.80	2956953.79	21.5	Pass
L3	91.09 - 44.793	Pole	TP62.86x47.4122x0.4375	3	-31886.30	4329637.14	31.5	Pass
L4	44.793 - 0	Pole	TP75x59.5377x0.5	4	-55879.70	6146502.73	34.6	Pass
						Summary	ELC:	Load Case 5
						Pole (L4)	34.6	Pass
						Rating =	34.6	Pass

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(1) 1/2" TO 74 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 150 FT LEVEL
(PROPOSED)
(1) 1-5/8" TO 124 FT LEVEL
(INSTALLED)
(18) 1-5/8" TO 124 FT LEVEL
(INSTALLED)
(1) 2" CONDUIT TO 116 FT LEVEL
(1) 3/8" TO 116 FT LEVEL
(2) 3/4" TO 116 FT LEVEL
(12) 1-1/4" TO 116 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 107 FT LEVEL
(NOT INSTALLED)
(6) 1-5/8" TO 133 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 133 FT LEVEL
A1
A2
B1
B2

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *876385*
Site Name: *N. Coventry / Wallbeoff*
App #: *211527*

Pole Manufacturer:	*Other*

Reactions		
Moment:	3174.619	ft-kips
Axial:	55.887	kips
Shear:	31.71	kips

Anchor Rod Data		
Qty:	28	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	85	in

Plate Data		
Diam:	91	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.50	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	75	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Rigid
Maximum Rod Tension:	62.0 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	31.8% **Pass**	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	28.1 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	46.8% **Pass**	Y.L. Length: 40.00

n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

GPD GROUP

Mat Foundation Analysis
N. Coventry / Wallbeoff BU #: 876385
2014777.876835.02

General Info	
Code	TIA/EIA-222-F (LRFD)
Bearing On	Rock
Foundation Type	Mono Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1

Tower Reactions		
Moment, M	3174.619	k-ft
Axial, P	55.887	k
Shear, V	31.71	k

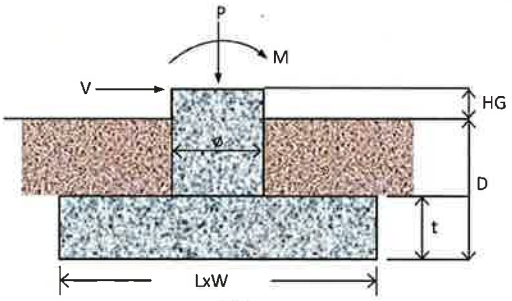
Pad & Pier Geometry		
Pier Width, ø	9	ft
Pad Length, L	29	ft
Pad Width, W	29	ft
Pad Thickness, t	3	ft
Depth, D	8	ft
Height Above Grade, HG	1	ft

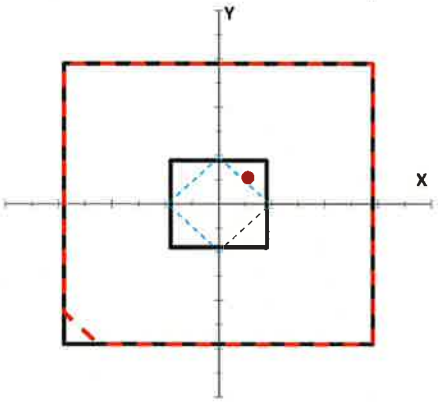
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 9	
Pad Quantity Per Layer	54	
Pier Rebar Size	# 8	
Pier Quantity of Rebar	62	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	110	pcf
Angle of Friction, ø	28.8	°
Bearing Type	Net	
Ultimate Bearing	16	ksf
Water Table Depth	99	ft
Frost Depth	4	ft

Bearing Summary			Load Case
Qxmax	2.28	ksf	1.2D+1.6W
Qymax	2.28	ksf	1.2D+1.6W
Qmax @ 45°	2.81	ksf	1.2D+1.6W
$Q_{(all)\ Gross}$	12.66	ksf	
Controlling Capacity	**22.2%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	3.10	≥1.0	0.9D+1.6W
FS(ot)y	3.10	≥1.0	0.9D+1.6W
Controlling Capacity	**32.2%**	**Pass**	





GPD GROUP

Base Foundation Reinforcement Check
N. Coventry / Wallbeoff BU #: 876385
2014777.876835.02

Code: TIA/EIA-222-F

Tower Reactions	
Moment	3174.619 k-ft
Axial	55.887 k
Shear	31.71 k

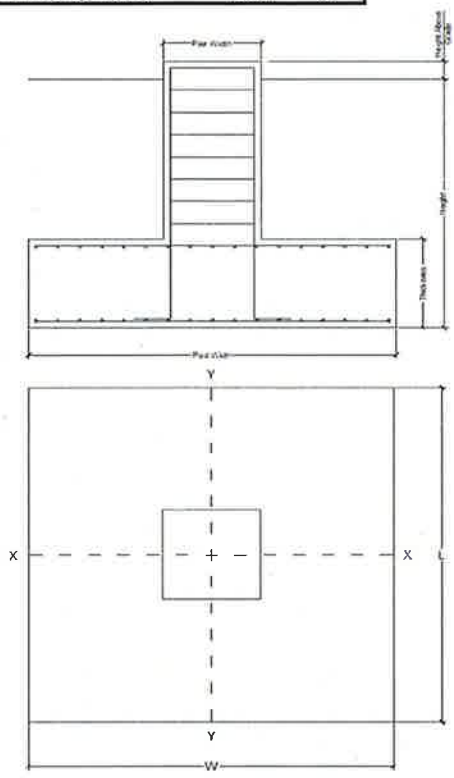
Overall Capacities		
Reinforcement Capacity	15.7%	OK
As Min Met?	No	
Controlling Capacity	15.7%	OK

Pad & Pier Geometry	
Height	8 ft
Height above Grade	1 ft
Pad Length, L	29 ft
Pad Width, W	29 ft
Pad Thickness	3 ft
Pier Shape	Square
Square Pier Width	9 ft

Pad & Pier Reinforcing	
Reinforcing Known	Yes
f_c'	4 ksi
Clear Cover	3 in
Rebar Fy	60 ksi
Pad Rebar Size	# 9
Pad Rebar Quantity	54
Pier Rebar Size	# 8
Pier Rebar Quantity	62

Unit Weights	
Concrete Unit Weight	150 pcf
Soil Unit Weight	110 pcf

Orthogonal Bearing	
Q_{max}	2.28 ksf
Q_{min}	0.36 ksf



Pad Moment Capacity		
ϕ (bending)=	0.90	
M_u=	37.97 k-ft	
ϕM_n=	250.87 k-ft	
Moment Capacity	15.1%	OK
One-Way (Wide-Beam) Shear		
V_u=	14.47 psi	
ϕV_n=	94.87 psi	
Shear Capacity	15.2%	OK
Two-Way (Punching) Shear		
V_u=	29.82 psi	
ϕV_n=	189.74 psi	
Shear Capacity	15.7%	OK
Pier Compression		
P_u=	72.65 k	
ϕP_n=	15389.80 k	
Compression Capacity	0.5%	OK

<---As min not met, pier checked as plain concrete member