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Also admitted in Massachusetts

June 16, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
49 Wig Hill Road, Chester, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level on the existing 150-foot tower at 49 Wig Hill Road in Chester, Connecticut (the "Property"). The tower is owned by Crown Castle. Cellco's use of the tower was approved by the Council in 1998 (Docket No. 181). Cellco now intends to modify its facility by replacing six (6) existing antennas with three (3) model LNX-6514DS-VTM, 1900 MHz antennas and three (3) model HBX-6517DS-VTM, 2100 MHz antennas, all at the same 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 antenna, 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 Edmund Meehan, First Selectman of the Town of Chester. A copy of this letter is also being sent to Bruce A. and Mary C. Rayner, the owners 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. Cellco's new antennas and RRHs will be installed at the 140-foot level on the existing 150-foot tower.

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

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

4. The operation of the replacement antennas 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 General Power Density table for Cellco's modified facility is included in Attachment 2.

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

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Edmund Meehan, Chester First Selectman
Bruce A. and Mary C. Rayner
Sandy M. Carter

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	12.5	11.2
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	20	20
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	698 – 896 MHz

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Product Specifications

LNX-6514DS-VTM

Dimensions

Depth	181.0 mm | 7.1 in
Length	1847.0 mm | 72.7 in
Width	301.0 mm | 11.9 in
Net Weight	17.6 kg | 38.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6514DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6514DS-A1M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBX-6517DS-VTM

Andrew® Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry to minimize any sector overlap
- Rugged, reliable design with excellent passive intermodulation suppression
- The values presented on this datasheet have been calculated based on N-P-BASTA White Paper version 9.6 by the NGMN Alliance

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.9
Gain by all Beam Tilts Tolerance, dB	±0.2	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.3 3 ° | 18.6 6 ° | 18.4	0 ° | 18.4 3 ° | 18.7 6 ° | 18.6	0 ° | 18.8 3 ° | 19.1 6 ° | 18.7
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Horizontal Tolerance, degrees	±1.8	±0.9	±2.8
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beamwidth, Vertical Tolerance, degrees	±0.2	±0.2	±0.3
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	19	19	18
Front-to-Back Total Power at 180° ± 30°, dB	26	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	11	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz
Number of Ports, all types	2

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom

Product Specifications

HBX-6517DS-VTM

RF Connector Quantity, total	2
Wind Loading, maximum	393.0 N @ 150 km/h 88.3 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	83.0 mm | 3.3 in
Length	1902.0 mm | 74.9 in
Width	166.0 mm | 6.5 in
Net Weight	6.2 kg | 13.7 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBX-6517DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBX-6517DS-A1M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

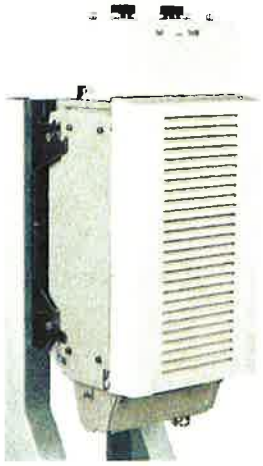
DB390 — Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Use for narrow panel antennas. Includes two pipe mounts.

DB5098E — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

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

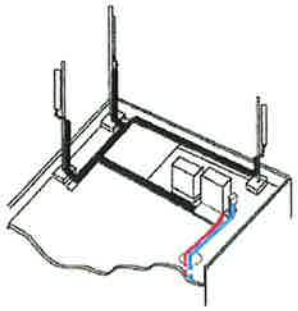
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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

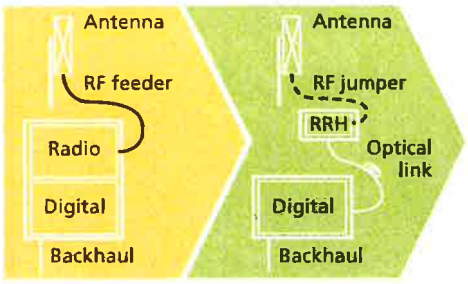
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

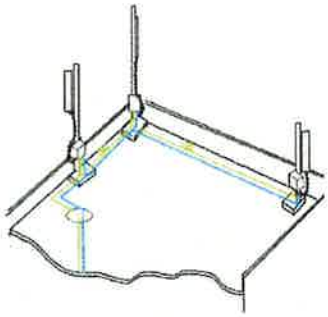
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

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

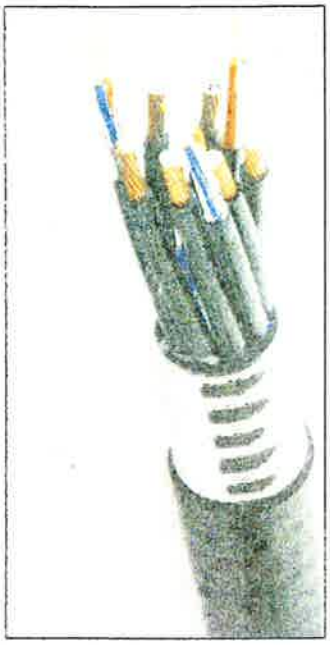


Figure 1: HYBRIFLEX Series

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)

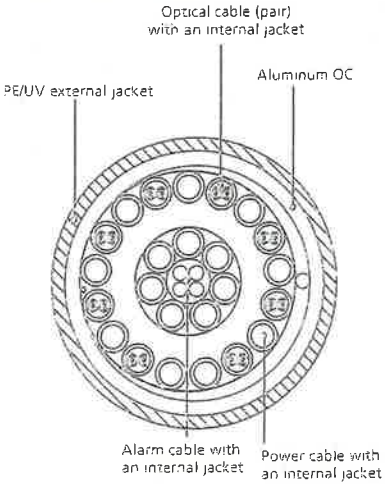


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Chester								
Tower Height: 150Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	132	0.0233	880	0.5867	3.97%	
*AT&T UMTS	2	875	132	0.0361	1900	1.0000	3.61%	
*AT&T GSM	1	283	132	0.0058	880	0.5867	1.00%	
*AT&T GSM	4	525	132	0.0433	1900	1.0000	4.33%	
*AT&T LTE	1	1313	132	0.0271	734	0.4893	5.54%	
*Pocket (now MetroPCS)	6	631	96	0.1477	2130	1.0000	14.77%	
*Sprint+Nextel+Omnpt	(sprint at 150')						12.52%	
*VSECI	1	29.39024	170	0.0004	933.175	0.6221	0.06%	
*VSECI	1	300	170	0.0037	46.18	0.2000	1.87%	
*VSECI	1	300	170	0.0037	46.44	0.2000	1.87%	
Verizon	**11**	**220**	**140**	**0.0444**	**1970**	**1.0000**	**4.44%**	
Verizon	**9**	**356**	**140**	**0.0588**	**869**	**0.5793**	**10.15%**	
Verizon	**1**	**1914**	**140**	**0.0351**	**2145**	**1.0000**	**3.51%**	
Verizon	**1**	**795**	**140**	**0.0146**	**698**	**0.4653**	**3.13%**	
								70.77%
* Source: Siting Council								

ATTACHMENT 3

Date: **March 19, 2014**

Holly Haas
Crown Castle
3530 Toringdon Way, Site 300
Charlotte, NC 28277
(704) 405-6535

SSOE Group
320 Seven Springs Way, Ste. 350
Brentwood, TN 37027
(615) 661-7585
dsavla@ssoe.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	119727
	Carrier Site Name:	Chester CT
Crown Castle Designation:	**Crown Castle BU Number:**	800515
	Crown Castle Site Name:	CT Chester CAC 800515
	Crown Castle JDE Job Number:	265113
	Crown Castle Work Order Number:	726101
	Crown Castle Application Number:	219488 Rev. 0
Engineering Firm Designation:	**SSOE Group Project Number:**	014-00546-00
Site Data:	**Wig Hill Road, Chester, CT 06412, Middlesex County** **Latitude *41° 24' 13.93"*, Longitude *-72° 28' 20.82"*** **150 Foot – Modified EEI Monopole Tower**	

Dear Ms. Holly Haas,

SSOE 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 626515, in accordance with application 219488, 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 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

We at *SSOE 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.

Structural analysis prepared by: Deepesh Savla, EI

Respectfully submitted by:

STATE OF CONNECTICUT BARRY W. BURGESS NO. 26165 LICENSED PROFESSIONAL ENGINEER 3/19/14

Barry W. Burgess, PE
Section Manager

TABLE OF CONTENTS

1) INTRODUCTION

The existing 150' monopole has eighteen sides and is evenly tapered from 62.00" (flat-flat) at the base to 21.00" (flat-flat) at the top. It has four major sections, connected with slip joints. The structure is galvanized and has no tower lighting.

The tower was originally designed for Bell Atlantic by EEI of Mentor, Ohio for a 90 mph wind speed with 0.5" radial ice in accordance with ANSI/EIA-TIA-222-F.

Modifications by GPD (Project #: 2005078.33, dated 3/1/05) consisted of installing stiffeners to the base plate. These modifications were considered in this analysis.

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, 38 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
139.0	142.0	3	Alcatel lucent	RRH2X40-AWS	1	1-5/8	1
		3	Andrew	HBX-6517DS-VTM w/ Mount Pipe			
		3	Andrew	LNX-6514DS-VTM w/ Mount Pipe			
		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	DB980H90E-M w/ Mount Pipe	6	1-5/8	
	150.0	1		Platform Mount [LP 713-1]			
148.0	163.0	1	RFS Celwave	PD1142-1	4	7/8	
	162.0	1	Decibel	DB636-A			
	159.0	1	Decibel	DB636-A			
		1	RFS Celwave	PD1142-1			
	148.0	1		Side Arm Mount [SO 702-4]			
139.0	142.0	6	Antel	LPA-80080-4CF-EDIN-0 w/ Mount Pipe	12 3	1-5/8 13/64	1
		3	Antel	BXA-171085-8BF-EDIN-2 w/ Mount Pipe			
		3	Antel	BXA-70063-6CF-2 w/ Mount Pipe			
	139.0	6	RFS Celwave	FD9R6004/2C-3L			
		1		Platform Mount [LP 713-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134.0	134.0	6	Ericsson	RRUS-11			
		1		Side Arm Mount [SO 102-3]			
132.0	142.0	1	Decibel	DB810KE-YP	2 1 1 12	7/16 3/8 7/8 1-1/4	
	132.0	1	Andrew	DBXNH-6565B-R2M w/ Mount Pipe			
		2	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		8	Powerwave Technologies	LGP21901			
		1	Raycap	DC6-48-60-18-8F			
		1		Platform Mount [LP 713-1]			
116.0	120.0	2	GPS	GPS_A	2 12	1/2 1-1/4	
	118.0	12	Allgon	7120.16 w/ Mount Pipe			
	116.0	1		Platform Mount [LP 713-1]			
106.0	108.0	6	Dapa	59212 w/ Mount Pipe	6	1-5/8	
	106.0	1		Platform Mount [LP 713-1]			
96.0	96.0	3	RFS Celwave	APXV18-206517LS w/ Mount Pipe	6	1-1/4	
		1		Side Arm Mount [SO 104-3]			
75.0	75.0	1	GPS	GPS_RESERVED	1	1/2	
		1		Side Arm Mount [SO 701-1]			
70.0	70.0	1	Kathrein	PR-950	1	WEP65	
		1		Side Arm Mount [SO 901-1]			

Notes:
1) Equipment to be removed. Not considered in this analysis.

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	12	Allgon	ALP 9212	-	-
		1		Standard AMPS Platform		
140.0	140.0	12	Allgon	ALP 9212	-	-
		1		Standard AMPS Platform		
130.0	130.0	12	Allgon	ALP 9212	-	-
		1		Standard AMPS Platform		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
116.0	116.0	12	Allgon	ALP 9212	-	-
		1		Standard AMPS Platform		
106.0	106.0	12	Allgon	ALP 9212	-	-
		1		Standard AMPS Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	EEI Job #: 4123, dated 8/7/98	Doc ID#: 671925	Crown DMZ
Geotechnical Reports	Dr. Clarence Welti, dated 10/27/98	Doc ID#: 2301672	Crown DMZ
Foundation Mapping	TEP Project #: 081974, dated 7/31/08	Doc ID#: 671930	Crown DMZ
Modification Drawings	GPD project #: 2005078.33, dated 3/1/05	Doc ID#: 1037702	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) The tower was constructed in accordance with its original design and maintained per the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by SSOE.
4) Mount pipes are removed when the antennas they support are removed.
5) Coax mounting equipment (feedline ladders, T-brackets, etc.) is removed when all coax attached to the equipment is removed from the tower.
6) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
7) All foundation steel reinforcing is assumed to have been designed to meet or exceed the load carrying capacity of the surrounding soils unless otherwise specified in this report.
8) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 3/11/14 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. SSOE 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	150 - 122.92	Pole	TP28.83x21x0.1875	1	-7.82	848.86	53.2	Pass
L2	122.92 - 84.26	Pole	TP39.51x27.2493x0.375	2	-18.55	2324.15	66.6	Pass
L3	84.26 - 41.55	Pole	TP50.99x37.1855x0.4375	3	-30.59	3506.36	72.6	Pass
L4	41.55 - 0	Pole	TP62x48.1335x0.5	4	-44.35	4764.26	67.8	Pass
							Summary	
						Pole (L3)	72.6	Pass
						Rating =	72.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods		60.8%	Pass
1	Base Plate		47.5%	Pass
1	Base Foundation		79.1%	Pass

Structure Rating (max from all components) =	79.1%

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

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

The engineering services rendered by SSOE 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 resist dead loads only when no other loads are applied. No allowance has been made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance has been made for any loose bolts or cracked welds.

For the purposes of this report, SSOE Group has assumed that all connections in the tower are sufficient to develop the allowable strength of the associated members. SSOE Group has not performed engineering analysis to verify adequacy of these connections.

It is the owner's responsibility to determine the amount of ice accumulation, 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 clearances in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a construction document. Construction documents depicting the required modification are obtainable from SSOE Group, but are beyond the scope of this report.

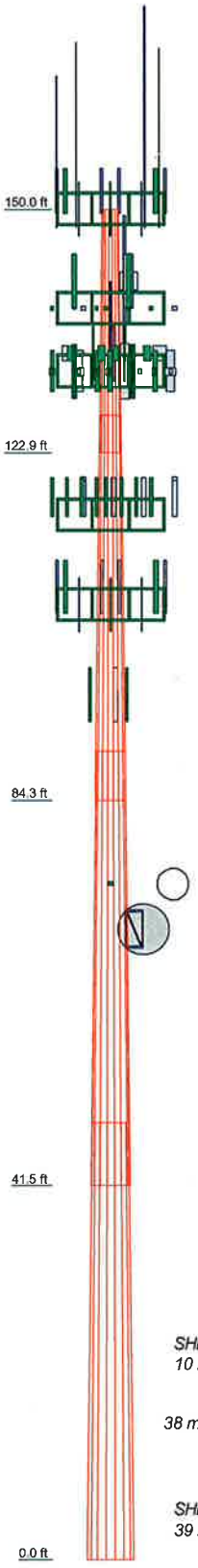
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE 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. SSOE 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 SSOE 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)	27.08	42.83	48.21	48.47
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3750	0.4375	0.5000
Socket Length (ft)	4.17	5.50	6.92	
Top Dia (in)	21.0000	27.2493	37.1655	48.1335
Bot Dia (in)	28.8300	39.5100	50.9900	62.0000
Grade	A607-65			
Weight (K)	1.4	5.7	8.9	14.3



AXIAL
68 K
SHEAR
10 K
MOMENT
1178 kip-ft
TORQUE 2 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
49 K
SHEAR
39 K
MOMENT
4281 kip-ft
TORQUE 6 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 713-1]	150	6' x 2" mount pipe	134
9' Ladder	150	8' x 2.25" Mount Pipe	134
(2) DB980H90E-M w/ Mount Pipe	150	8' x 2.25" Mount Pipe	134
(2) DB980H90E-M w/ Mount Pipe	150	Platform Mount [LP 713-1]	132
(2) DB980H90E-M w/ Mount Pipe	150	9' Ladder	132
(2) 6' x 2" mount pipe	150	DB810KE-YP	132
(2) 6' x 2" mount pipe	150	(2) 7770.00 w/ Mount Pipe	132
(2) 6' x 2" mount pipe	150	DBXNH-6565B-R2M w/ Mount Pipe	132
Side Arm Mount [SO 702-4]	148	(2) LGP21401	132
PD1142-1	148	(4) LGP21901	132
DB636-A	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
PD1142-1	148		
DB636-A	148	(2) 7770.00 w/ Mount Pipe	132
8' x 2.25" Mount Pipe	148	(2) LGP21401	132
8' x 2.25" Mount Pipe	148	(2) LGP21901	132
8' x 2.25" Mount Pipe	148	DC6-48-60-18-8F	132
8' x 2.25" Mount Pipe	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
Platform Mount [LP 713-1]	139		
9' Ladder	139	(2) 7770.00 w/ Mount Pipe	132
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(2) LGP21401	132
		(2) LGP21901	132
BXA-70063-6CF-2 w/ Mount Pipe	139	6' x 2" mount pipe	132
(2) FD9R6004/2C-3L	139	6' x 2" mount pipe	132
RRH2X40-AWS	139	6' x 2" mount pipe	132
HBX-6517DS-VTM w/ Mount Pipe	139	Platform Mount [LP 713-1]	116
LNX-6514DS-VTM w/ Mount Pipe	139	9' Ladder	116
DB-T1-6Z-8AB-0Z	139	(4) 7120.16 w/ Mount Pipe	116
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(2) GPS_A	116
		(4) 7120.16 w/ Mount Pipe	116
BXA-70063-6CF-2 w/ Mount Pipe	139	(4) 7120.16 w/ Mount Pipe	116
(2) FD9R6004/2C-3L	139	Platform Mount [LP 713-1]	106
RRH2X40-AWS	139	9' Ladder	106
HBX-6517DS-VTM w/ Mount Pipe	139	(2) 59212 w/ Mount Pipe	106
LNX-6514DS-VTM w/ Mount Pipe	139	(2) 59212 w/ Mount Pipe	106
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(2) 59212 w/ Mount Pipe	106
		6' x 2" mount pipe	106
BXA-70063-6CF-2 w/ Mount Pipe	139	6' x 2" mount pipe	106
(2) FD9R6004/2C-3L	139	6' x 2" mount pipe	106
RRH2X40-AWS	139	Side Arm Mount [SO 104-3]	96
HBX-6517DS-VTM w/ Mount Pipe	139	APXV18-206517LS w/ Mount Pipe	96
LNX-6514DS-VTM w/ Mount Pipe	139	APXV18-206517LS w/ Mount Pipe	96
Side Arm Mount [SO 102-3]	134	APXV18-206517LS w/ Mount Pipe	96
(2) RRUS-11	134	GPS_RESERVED	75
(2) RRUS-11	134	Side Arm Mount [SO 701-1]	75
(2) RRUS-11	134	Side Arm Mount [SO 901-1]	70
6' x 2" mount pipe	134	PR-950	70
6' x 2" mount pipe	134		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

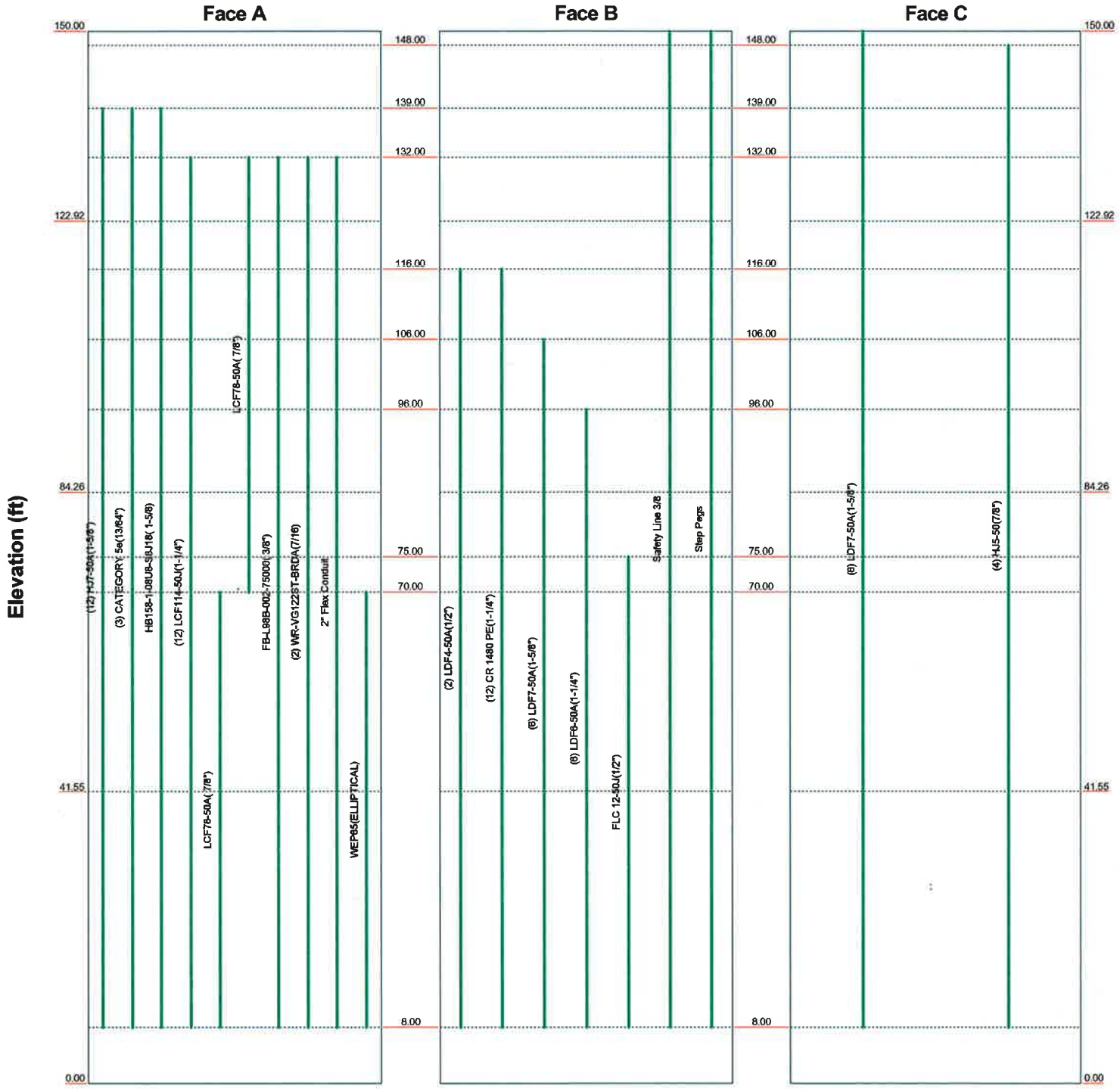
1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 72.6%

SSOE Group
320 Seven Springs Way, Ste. 350
Brentwood, TN 37027
Phone: (615) 661-7585
FAX: (615) 661-7569

Job: *BU 800515*			
Project: *014-00546-00*			
Client: CCI	Drawn by: 15212	App'd:	
Code: TIA/EIA-222-F	Date: 03/19/14	Scale: NTS	
Path: C:\Users\15212\Desktop\Projects\Towers\800515 CT Chester Cir_800515\tnx\800515.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 150'

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



SSOE Group 320 Seven Springs Way, Ste. 350 Brentwood, TN 37027 Phone: (615) 661-7585 FAX: (615) 661-7569	Job: ***BU 800515***		
	Project: ***014-00546-00***		
	Client: CCI	Drawn by: 15212	App'd:
	Code: TIA/EIA-222-F	Date: 03/19/14	Scale: NTS
	Path: C:\Users\15212\Desktop\Projects\Towers\800515 CT Chester Cty 800515\pn\800515.pn		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:

Tower is located in Middlesex 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 pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	150.00-122.92	27.08	4.17	18	21.0000	28.8300	0.1875	0.7500	A607-65 (65 ksi)
L2	122.92-84.26	42.83	5.50	18	27.2493	39.5100	0.3750	1.5000	A607-65 (65 ksi)
L3	84.26-41.55	48.21	6.92	18	37.1855	50.9900	0.4375	1.7500	A607-65 (65 ksi)
L4	41.55-0.00	48.47		18	48.1335	62.0000	0.5000	2.0000	A607-65 (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	21.3240	12.3860	677.8263	7.3884	10.6680	63.5383	1356.5444	6.1942	3.3660	17.952
	29.2747	17.0459	1766.7635	10.1681	14.6456	120.6341	3535.8517	8.5246	4.7441	25.302
L2	28.8818	31.9871	2918.6755	9.5404	13.8426	210.8469	5841.1915	15.9966	4.1359	11.029
	40.1195	46.5804	9013.0474	13.8929	20.0711	449.0564	18037.9544	23.2946	6.2938	16.783
L3	39.3584	51.0293	8706.1286	13.0456	18.8903	460.8793	17423.7129	25.5195	5.7747	13.199
	51.7766	70.1985	22664.7192	17.9461	25.9029	874.9870	45359.2613	35.1059	8.2042	18.753
L4	50.8863	75.5944	21669.6835	16.9099	24.4518	886.2193	43367.8806	37.8044	7.5915	15.183
	62.9564	97.6005	46637.9792	21.8325	31.4960	1480.7588	93337.3258	48.8095	10.0320	20.064

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 150.00-122.92				1	1	1		
L2 122.92-84.26				1	1	1		
L3 84.26-41.55				1	1	1		
L4 41.55-0.00				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 - 8.00	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
HJ5-50(7/8")	C	No	Inside Pole	148.00 - 8.00	4	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
						1" Ice	0.00	0.54
						2" Ice	0.00	0.54
						4" Ice	0.00	0.54
HJ7-50A(1-5/8")	A	No	Inside Pole	139.00 - 8.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
CATEGORY 5e(13/64")	A	No	Inside Pole	139.00 - 8.00	3	No Ice	0.00	0.02
						1/2" Ice	0.00	0.02
						1" Ice	0.00	0.02
						2" Ice	0.00	0.02
						4" Ice	0.00	0.02
HB158-1-08U8-S8J18(1-5/8)	A	No	Inside Pole	139.00 - 8.00	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")	A	No	Inside Pole	132.00 - 8.00	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
LCF78-50A(7/8")	A	No	CaAa (Out Of Face)	70.00 - 8.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	1.31
						1" Ice	0.00	2.89
						2" Ice	0.00	7.89

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	25.21
LCF78-50A(7/8")	A	No	CaAa (Out Of Face)	132.00 - 70.00	1	No Ice	0.11	0.34
						1/2" Ice	0.21	1.31
						1" Ice	0.31	2.89
						2" Ice	0.51	7.89
						4" Ice	0.91	25.21
FB-L98B-002-75000(3/8")	A	No	Inside Pole	132.00 - 8.00	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-VG122ST-BRDA(7/16)	A	No	Inside Pole	132.00 - 8.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
2" Flex Conduit	A	No	Inside Pole	132.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32
LDF4-50A(1/2")	B	No	Inside Pole	116.00 - 8.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
CR 1480 PE(1-1/4")	B	No	Inside Pole	116.00 - 8.00	12	No Ice	0.00	0.55
						1/2" Ice	0.00	0.55
						1" Ice	0.00	0.55
						2" Ice	0.00	0.55
						4" Ice	0.00	0.55
LDF7-50A(1-5/8")	B	No	Inside Pole	106.00 - 8.00	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
LDF6-50A(1-1/4")	B	No	Inside Pole	96.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
FLC 12-50J(1/2")	B	No	CaAa (Out Of Face)	75.00 - 8.00	1	No Ice	0.00	0.17
						1/2" Ice	0.00	0.87
						1" Ice	0.00	2.17
						2" Ice	0.00	6.62
						4" Ice	0.00	22.84
WEP65(ELLIPTICAL)	A	No	CaAa (Out Of Face)	70.00 - 8.00	1	No Ice	0.20	0.53
						1/2" Ice	0.30	2.08
						1" Ice	0.40	4.23
						2" Ice	0.60	10.38
						4" Ice	1.00	30.00
Safety Line 3/8	B	No	CaAa (Out Of Face)	150.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
Step Pegs	B	No	CaAa (Out Of Face)	150.00 - 8.00	1	No Ice	0.08	2.72
						1/2" Ice	0.18	3.51
						1" Ice	0.28	4.92
						2" Ice	0.48	9.56
						4" Ice	0.88	26.18

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-122.92	A	0.000	0.000	0.000	0.990	0.31
		B	0.000	0.000	0.000	3.182	0.08
		C	0.000	0.000	0.000	0.000	0.19
L2	122.92-84.26	A	0.000	0.000	0.000	4.214	0.90
		B	0.000	0.000	0.000	4.543	0.49
		C	0.000	0.000	0.000	0.000	0.27
L3	84.26-41.55	A	0.000	0.000	0.000	7.330	1.01
		B	0.000	0.000	0.000	5.018	0.81
		C	0.000	0.000	0.000	0.000	0.30
L4	41.55-0.00	A	0.000	0.000	0.000	6.811	0.80
		B	0.000	0.000	0.000	3.942	0.63
		C	0.000	0.000	0.000	0.000	0.24

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-122.92	A	0.889	0.000	0.000	0.000	2.604	0.33
		B		0.000	0.000	0.000	12.809	0.16
		C		0.000	0.000	0.000	0.000	0.19
L2	122.92-84.26	A	0.860	0.000	0.000	0.000	11.086	0.98
		B		0.000	0.000	0.000	18.286	0.60
		C		0.000	0.000	0.000	0.000	0.27
L3	84.26-41.55	A	0.810	0.000	0.000	0.000	14.672	1.19
		B		0.000	0.000	0.000	19.703	0.98
		C		0.000	0.000	0.000	0.000	0.30
L4	41.55-0.00	A	0.750	0.000	0.000	0.000	12.243	0.96
		B		0.000	0.000	0.000	14.808	0.77
		C		0.000	0.000	0.000	0.000	0.24

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-122.92	0.1421	0.0257	0.4567	0.1453
L2	122.92-84.26	0.1413	-0.0698	0.4653	-0.0571
L3	84.26-41.55	0.1417	-0.1611	0.4781	-0.1385
L4	41.55-0.00	0.1144	-0.1622	0.3882	-0.1465

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 713-1]	C	None		0.0000	150.00	No Ice	31.27	31.27	1.51
						1/2" Ice	39.68	39.68	1.93
						1" Ice	48.09	48.09	2.35
						2" Ice	64.91	64.91	3.19
						4" Ice	98.55	98.55	4.86
9' Ladder	A	From Centroid-	3.00 / 0.00	0.0000	150.00	No Ice	4.50	2.25	0.08
						1/2"	5.50	2.75	0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Leg	0.00			Ice	6.50	3.25	0.17
						1" Ice	8.50	4.25	0.26
						2" Ice	12.50	6.25	0.44
						4" Ice			
(2) DB980H90E-M w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.07
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.07
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice	4.04	3.62	0.03
						1/2" Ice	4.50	4.48	0.07
						1" Ice	4.95	5.22	0.11
						2" Ice	5.87	6.74	0.22
						4" Ice	8.05	10.00	0.55
(2) 6' x 2" mount pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
(2) 6' x 2" mount pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
(2) 6' x 2" mount pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	150.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
Side Arm Mount [SO 702-4]	C	None		0.0000	148.00	No Ice	4.86	4.86	0.11
						1/2" Ice	6.60	6.60	0.15
						1" Ice	8.34	8.34	0.20
						2" Ice	11.82	11.82	0.28
						4" Ice	18.78	18.78	0.46
PD1142-1	B	From Face	5.20 -3.00 15.00	-30.0000	148.00	No Ice	1.32	1.32	0.01
						1/2" Ice	3.21	3.21	0.02
						1" Ice	5.12	5.12	0.05
						2" Ice	8.99	8.99	0.14
						4" Ice	16.94	16.94	0.46
DB636-A	B	From Leg	5.91 1.04 14.00	10.0000	148.00	No Ice	2.78	2.78	0.03
						1/2" Ice	3.96	3.96	0.05
						1" Ice	5.16	5.16	0.08
						2" Ice	7.24	7.24	0.16
						4" Ice	10.16	10.16	0.41
PD1142-1	C	From Leg	5.20 -3.00 11.00	-30.0000	148.00	No Ice	1.32	1.32	0.01
						1/2" Ice	3.21	3.21	0.02
						1" Ice	5.12	5.12	0.05
						2" Ice	8.99	8.99	0.14
						4" Ice	16.94	16.94	0.46
DB636-A	A	From Face	6.00	0.0000	148.00	No Ice	2.78	2.78	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 11.00			1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 5.16 7.24 10.16	3.96 5.16 7.24 10.16	0.05 0.08 0.16 0.41
8' x 2.25" Mount Pipe	B	From Face	5.20 -3.00 4.00	-30.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	B	From Leg	5.91 1.04 4.00	10.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	C	From Leg	5.20 -3.00 4.00	-30.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	A	From Face	6.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
Platform Mount [LP 713-1]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
9' Ladder	A	From Centroid-Leg	3.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.16 3.53 3.94 4.83 6.73	3.33 3.94 4.56 5.86 8.84	0.03 0.06 0.10 0.19 0.48
BXA-70063-6CF-2 w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	A	From Centroid-Leg	3.46 2.00 0.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2X40-AWS	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.44 4.36	1.59 1.80 2.01 2.43 3.27	0.04 0.06 0.08 0.12 0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
HBX-6517DS-VTM w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
LNX-6514DS-VTM w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	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	0.04 0.08 0.12 0.21 0.45
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.16 3.53 3.94 4.83 6.73	3.33 3.94 4.56 5.86 8.84	0.03 0.06 0.10 0.19 0.48
BXA-70063-6CF-2 w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	B	From Centroid-Leg	3.46 2.00 0.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2X40-AWS	B	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.44 4.36	1.59 1.80 2.01 2.43 3.27	0.04 0.06 0.08 0.12 0.20
HBX-6517DS-VTM w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
LNX-6514DS-VTM w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.16 3.53 3.94 4.83 6.73	3.33 3.94 4.56 5.86 8.84	0.03 0.06 0.10 0.19 0.48
BXA-70063-6CF-2 w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) FD9R6004/2C-3L	C	From Centroid-Leg	3.46 2.00 0.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2X40-AWS	C	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.44 4.36	1.59 1.80 2.01 2.43 3.27	0.04 0.06 0.08 0.12 0.20
HBX-6517DS-VTM w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
LNX-6514DS-VTM w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 3.00	30.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
Side Arm Mount [SO 102-3]	C	None		0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
(2) RRUS-11	A	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	B	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	C	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
6' x 2" mount pipe	A	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
6' x 2" mount pipe	B	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
6' x 2" mount pipe	C	From Leg	0.92 0.39 0.00	23.0000	134.00	No Ice 1/2" Ice 1" Ice	1.44 1.93 2.30 3.07	1.44 1.93 2.30 3.07	0.02 0.03 0.05 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	4.71	4.71	0.23
						4" Ice			
8' x 2.25" Mount Pipe	A	From Leg	6.00	0.0000	134.00	No Ice	3.00	3.00	0.05
			0.00			1/2"	3.92	3.92	0.06
			0.00			Ice	4.84	4.84	0.09
						1" Ice	6.18	6.18	0.16
						2" Ice	8.60	8.60	0.38
						4" Ice			
8' x 2.25" Mount Pipe	A	From Leg	6.00	0.0000	134.00	No Ice	3.00	3.00	0.05
			0.00			1/2"	3.92	3.92	0.06
			4.00			Ice	4.84	4.84	0.09
						1" Ice	6.18	6.18	0.16
						2" Ice	8.60	8.60	0.38
						4" Ice			
Platform Mount [LP 713-1]	C	None		0.0000	132.00	No Ice	31.27	31.27	1.51
						1/2"	39.68	39.68	1.93
						Ice	48.09	48.09	2.35
						1" Ice	64.91	64.91	3.19
						2" Ice	98.55	98.55	4.86
						4" Ice			
9' Ladder	A	From Centroid-Leg	3.00	0.0000	132.00	No Ice	4.50	2.25	0.08
			0.00			1/2"	5.50	2.75	0.12
			0.00			Ice	6.50	3.25	0.17
						1" Ice	8.50	4.25	0.26
						2" Ice	12.50	6.25	0.44
						4" Ice			
DB810KE-YP	A	From Centroid-Leg	3.68	23.0000	132.00	No Ice	4.37	4.37	0.04
			1.56			1/2"	5.86	5.86	0.07
			10.00			Ice	7.37	7.37	0.11
						1" Ice	10.43	10.43	0.22
						2" Ice	14.16	14.16	0.56
						4" Ice			
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	3.68	23.0000	132.00	No Ice	6.22	4.35	0.06
			1.56			1/2"	6.77	5.20	0.11
			0.00			Ice	7.30	5.92	0.16
						1" Ice	8.38	7.41	0.29
						2" Ice	10.69	10.76	0.68
						4" Ice			
DBXNH-6565B-R2M w/ Mount Pipe	A	From Centroid-Leg	3.68	23.0000	132.00	No Ice	8.73	7.16	0.08
			1.56			1/2"	9.39	8.36	0.15
			0.00			Ice	10.02	9.29	0.23
						1" Ice	11.30	11.14	0.41
						2" Ice	13.99	15.20	0.92
						4" Ice			
(2) LGP21401	A	From Centroid-Leg	3.68	23.0000	132.00	No Ice	1.29	0.23	0.01
			1.56			1/2"	1.45	0.31	0.02
			0.00			Ice	1.61	0.40	0.03
						1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
(4) LGP21901	A	From Centroid-Leg	3.68	23.0000	132.00	No Ice	0.27	0.18	0.01
			1.56			1/2"	0.34	0.25	0.01
			0.00			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	3.68	23.0000	132.00	No Ice	8.50	6.30	0.07
			1.56			1/2"	9.15	7.48	0.14
			0.00			Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
						2" Ice	13.68	14.02	0.87
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Leg	3.68	23.0000	132.00	No Ice	6.22	4.35	0.06
			1.56			1/2"	6.77	5.20	0.11
			0.00			Ice	7.30	5.92	0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	8.38	7.41	0.29
						2" Ice	10.69	10.76	0.68
						4" Ice			
(2) LGP21401	B	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	1.29	0.23	0.01
						1/2" Ice	1.45	0.31	0.02
						1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(2) LGP21901	B	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	0.27	0.18	0.01
						1/2" Ice	0.34	0.25	0.01
						1" Ice	0.43	0.32	0.01
						2" Ice	0.62	0.49	0.02
						4" Ice	1.10	0.94	0.07
DC6-48-60-18-8F	B	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	2.22	2.22	0.02
						1/2" Ice	2.44	2.44	0.04
						1" Ice	2.66	2.66	0.06
						2" Ice	3.15	3.15	0.12
						4" Ice	4.21	4.21	0.27
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	8.50	6.30	0.07
						1/2" Ice	9.15	7.48	0.14
						1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	6.22	4.35	0.06
						1/2" Ice	6.77	5.20	0.11
						1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.29
						4" Ice	10.69	10.76	0.68
(2) LGP21401	C	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	1.29	0.23	0.01
						1/2" Ice	1.45	0.31	0.02
						1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(2) LGP21901	C	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	0.27	0.18	0.01
						1/2" Ice	0.34	0.25	0.01
						1" Ice	0.43	0.32	0.01
						2" Ice	0.62	0.49	0.02
						4" Ice	1.10	0.94	0.07
6' x 2" mount pipe	A	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
6' x 2" mount pipe	B	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
6' x 2" mount pipe	C	From Centroid-Leg	3.68 1.56 0.00	23.0000	132.00	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
Platform Mount [LP 713-1]	C	None		0.0000	116.00	No Ice	31.27	31.27	1.51
						1/2" Ice	39.68	39.68	1.93

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						Ice	48.09	48.09	2.35
						1" Ice	64.91	64.91	3.19
						2" Ice	98.55	98.55	4.86
						4" Ice			
9' Ladder	B	From Centroid-Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
(4) 7120.16 w/ Mount Pipe	A	From Centroid-Leg	3.46 2.00 2.00	30.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.52 3.92 4.33 5.26 7.26	6.22 6.99 7.74 9.28 12.59	0.03 0.08 0.13 0.26 0.62
(2) GPS_A	A	From Centroid-Leg	3.46 2.00 4.00	30.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
(4) 7120.16 w/ Mount Pipe	B	From Centroid-Leg	3.46 2.00 2.00	30.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.52 3.92 4.33 5.26 7.26	6.22 6.99 7.74 9.28 12.59	0.03 0.08 0.13 0.26 0.62
(4) 7120.16 w/ Mount Pipe	C	From Centroid-Leg	3.46 2.00 2.00	30.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.52 3.92 4.33 5.26 7.26	6.22 6.99 7.74 9.28 12.59	0.03 0.08 0.13 0.26 0.62
Platform Mount [LP 713-1]	C	None		0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
9' Ladder	A	From Centroid-Leg	3.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
(2) 59212 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.97 5.51 6.02 7.06 9.35	4.27 5.43 6.28 8.02 11.70	0.04 0.08 0.13 0.25 0.63
(2) 59212 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.97 5.51 6.02 7.06 9.35	4.27 5.43 6.28 8.02 11.70	0.04 0.08 0.13 0.25 0.63
(2) 59212 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.97 5.51 6.02 7.06 9.35	4.27 5.43 6.28 8.02 11.70	0.04 0.08 0.13 0.25 0.63
6' x 2" mount pipe	A	From	4.00	0.0000	106.00	No Ice	1.44	1.44	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Face	0.00 0.00			1/2" Ice	1.93 2.30	1.93 2.30	0.03 0.05
						1" Ice	3.07	3.07	0.09
						2" Ice	4.71	4.71	0.23
						4" Ice			
6' x 2" mount pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
6' x 2" mount pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
Side Arm Mount [SO 104-3]	C	None		0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 4.13 4.96 6.62 9.94	3.30 4.13 4.96 6.62 9.94	0.29 0.32 0.46 0.63 0.98
APXV18-206517LS w/ Mount Pipe	A	From Leg	0.87 0.50 0.00	30.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	B	From Leg	0.87 0.50 0.00	30.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	C	From Leg	0.87 0.50 0.00	30.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
GPS_RESERVED	C	From Face	3.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 701-1]	C	From Face	1.50 0.00 0.00	0.0000	75.00	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	0.07 0.08 0.09 0.12 0.18
Side Arm Mount [SO 901-1]	B	From Face	1.45 -0.39 0.00	-15.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.50 0.68 0.86 1.22 1.94	0.88 1.13 1.38 1.88 2.88	0.11 0.11 0.12 0.13 0.14

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
PR-950	B	Grid	From Face	2.90 -0.78 0.00	-15.0000		70.00	5.67	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	25.25 26.00 26.74 28.24 31.23	0.04 0.10 0.20 0.30 0.50

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
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
L1	150 - 122.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.30	-0.61	3.14
			Max. Mx	5	-7.87	-243.16	2.39
			Max. My	2	-7.82	-1.19	249.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	18.09	-243.16	2.39
			Max. Vx	2	-18.49	-1.19	249.96
			Max. Torque	5			3.76
L2	122.92 - 84.26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.48	-1.36	3.51
			Max. Mx	5	-18.60	-1155.39	3.75
			Max. My	2	-18.55	-2.71	1176.90
			Max. Vy	5	29.54	-1155.39	3.75
			Max. Vx	2	-29.99	-2.71	1176.90
			Max. Torque	6			4.01
L3	84.26 - 41.55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.45	-2.71	4.00
			Max. Mx	5	-30.62	-2469.63	6.26
			Max. My	2	-30.59	-5.73	2507.97
			Max. Vy	11	-34.02	2467.55	-2.54
			Max. Vx	8	34.43	3.07	-2504.82
			Max. Torque	6			5.44
L4	41.55 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-67.58	-3.27	4.18
			Max. Mx	5	-49.30	-4223.29	10.79
			Max. My	2	-49.30	-10.57	4280.88
			Max. Vy	11	-38.34	4221.51	-6.65
			Max. Vx	8	38.74	6.87	-4278.63
			Max. Torque	6			5.52

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	67.58	-0.01	10.21
	Max. H_x	11	49.31	38.31	-0.08
	Max. H_z	2	49.31	-0.09	38.70
	Max. M_x	2	4280.88	-0.09	38.70
	Max. M_z	5	4223.29	-38.30	0.09
	Max. Torsion	6	5.52	-33.09	-19.21
	Min. Vert	1	49.31	0.00	0.00
	Min. H_x	5	49.31	-38.30	0.09
	Min. H_z	8	49.31	0.08	-38.71
	Min. M_x	8	-4278.63	0.08	-38.71
	Min. M_z	11	-4221.51	38.31	-0.08
	Min. Torsion	12	-5.49	33.03	19.25

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	49.31	0.00	0.00	-1.65	-1.43	0.00
Dead+Wind 0 deg - No Ice	49.31	0.09	-38.70	-4280.88	-10.56	2.85
Dead+Wind 30 deg - No Ice	49.31	19.25	-33.62	-3716.55	-2121.65	0.08
Dead+Wind 60 deg - No Ice	49.31	33.28	-19.45	-2150.64	-3666.60	-3.18
Dead+Wind 90 deg - No Ice	49.31	38.30	-0.09	-10.79	-4223.29	-5.16
Dead+Wind 120 deg - No Ice	49.31	33.09	19.21	2126.33	-3650.99	-5.52
Dead+Wind 150 deg - No Ice	49.31	19.05	33.38	3693.34	-2103.21	-4.60
Dead+Wind 180 deg - No Ice	49.31	-0.08	38.71	4278.63	6.87	-2.94
Dead+Wind 210 deg - No Ice	49.31	-19.20	33.60	3711.62	2115.26	-0.15
Dead+Wind 240 deg - No Ice	49.31	-33.26	19.40	2143.80	3662.13	3.30
Dead+Wind 270 deg - No Ice	49.31	-38.31	0.08	6.65	4221.51	5.24

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+Wind 300 deg - No Ice	49.31	-33.03	-19.25	-2132.21	3643.86	5.49
Dead+Wind 330 deg - No Ice	49.31	-19.02	-33.44	-3700.95	2097.80	4.69
Dead+Ice+Temp	67.58	0.00	-0.00	-4.18	-3.27	0.00
Dead+Wind 0 deg+Ice+Temp	67.58	0.01	-10.21	-1176.74	-4.31	1.09
Dead+Wind 30 deg+Ice+Temp	67.58	5.08	-8.89	-1022.68	-584.13	0.17
Dead+Wind 60 deg+Ice+Temp	67.58	8.80	-5.13	-592.83	-1008.33	-0.99
Dead+Wind 90 deg+Ice+Temp	67.58	10.11	-0.01	-5.26	-1160.31	-1.72
Dead+Wind 120 deg+Ice+Temp	67.58	8.75	5.03	576.24	-1004.98	-1.72
Dead+Wind 150 deg+Ice+Temp	67.58	4.89	8.94	1017.48	-569.81	-1.51
Dead+Wind 180 deg+Ice+Temp	67.58	-0.23	10.32	1175.36	13.31	-0.56
Dead+Wind 210 deg+Ice+Temp	67.58	-5.21	8.94	1017.89	586.80	0.15
Dead+Wind 240 deg+Ice+Temp	67.58	-8.85	5.27	593.58	1005.44	0.56
Dead+Wind 270 deg+Ice+Temp	67.58	-10.21	0.23	12.36	1160.85	0.98
Dead+Wind 300 deg+Ice+Temp	67.58	-8.85	-4.94	-578.50	1005.04	1.58
Dead+Wind 330 deg+Ice+Temp	67.58	-4.98	-8.84	-1019.34	569.46	1.54
Dead+Wind 0 deg - Service	49.31	0.03	-13.39	-1483.46	-4.62	0.99
Dead+Wind 30 deg - Service	49.31	6.66	-11.63	-1288.05	-735.62	0.03
Dead+Wind 60 deg - Service	49.31	11.51	-6.73	-745.81	-1270.57	-1.10
Dead+Wind 90 deg - Service	49.31	13.25	-0.03	-4.86	-1463.32	-1.79
Dead+Wind 120 deg - Service	49.31	11.45	6.65	735.15	-1265.16	-1.92
Dead+Wind 150 deg - Service	49.31	6.59	11.55	1277.76	-729.24	-1.60
Dead+Wind 180 deg - Service	49.31	-0.03	13.40	1480.44	1.42	-1.02
Dead+Wind 210 deg - Service	49.31	-6.64	11.63	1284.09	731.48	-0.05
Dead+Wind 240 deg - Service	49.31	-11.51	6.71	741.20	1267.10	1.15
Dead+Wind 270 deg - Service	49.31	-13.26	0.03	1.18	1460.78	1.82
Dead+Wind 300 deg - Service	49.31	-11.43	-6.66	-739.43	1260.76	1.91
Dead+Wind 330 deg - Service	49.31	-6.58	-11.57	-1282.64	725.43	1.63

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-49.31	0.00	0.00	49.31	0.00	0.000%
2	0.09	-49.31	-38.70	-0.09	49.31	38.70	0.000%
3	19.25	-49.31	-33.62	-19.25	49.31	33.62	0.000%
4	33.28	-49.31	-19.45	-33.28	49.31	19.45	0.000%
5	38.30	-49.31	-0.09	-38.30	49.31	0.09	0.000%
6	33.09	-49.31	19.21	-33.09	49.31	-19.21	0.000%
7	19.05	-49.31	33.38	-19.05	49.31	-33.38	0.000%
8	-0.08	-49.31	38.71	0.08	49.31	-38.71	0.000%
9	-19.20	-49.31	33.60	19.20	49.31	-33.60	0.000%
10	-33.26	-49.31	19.40	33.26	49.31	-19.40	0.000%
11	-38.31	-49.31	0.08	38.31	49.31	-0.08	0.000%
12	-33.03	-49.31	-19.25	33.03	49.31	19.25	0.000%
13	-19.02	-49.31	-33.44	19.02	49.31	33.44	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
14	0.00	-67.58	0.00	-0.00	67.58	0.00	0.000%
15	0.01	-67.58	-10.21	-0.01	67.58	10.21	0.000%
16	5.08	-67.58	-8.89	-5.08	67.58	8.89	0.000%
17	8.80	-67.58	-5.13	-8.80	67.58	5.13	0.000%
18	10.11	-67.58	-0.01	-10.11	67.58	0.01	0.000%
19	8.75	-67.58	5.03	-8.75	67.58	-5.03	0.000%
20	4.89	-67.58	8.94	-4.89	67.58	-8.94	0.000%
21	-0.23	-67.58	10.32	0.23	67.58	-10.32	0.000%
22	-5.21	-67.58	8.94	5.21	67.58	-8.94	0.000%
23	-8.85	-67.58	5.27	8.85	67.58	-5.27	0.000%
24	-10.21	-67.58	0.23	10.21	67.58	-0.23	0.000%
25	-8.85	-67.58	-4.94	8.85	67.58	4.94	0.000%
26	-4.98	-67.58	-8.84	4.98	67.58	8.84	0.000%
27	0.03	-49.31	-13.39	-0.03	49.31	13.39	0.000%
28	6.66	-49.31	-11.63	-6.66	49.31	11.63	0.000%
29	11.51	-49.31	-6.73	-11.51	49.31	6.73	0.000%
30	13.25	-49.31	-0.03	-13.25	49.31	0.03	0.000%
31	11.45	-49.31	6.65	-11.45	49.31	-6.65	0.000%
32	6.59	-49.31	11.55	-6.59	49.31	-11.55	0.000%
33	-0.03	-49.31	13.40	0.03	49.31	-13.40	0.000%
34	-6.64	-49.31	11.63	6.64	49.31	-11.63	0.000%
35	-11.51	-49.31	6.71	11.51	49.31	-6.71	0.000%
36	-13.26	-49.31	0.03	13.26	49.31	-0.03	0.000%
37	-11.43	-49.31	-6.66	11.43	49.31	6.66	0.000%
38	-6.58	-49.31	-11.57	6.58	49.31	11.57	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	5	0.00000001	0.00000890
3	Yes	6	0.00000001	0.00000358
4	Yes	6	0.00000001	0.00000390
5	Yes	5	0.00000001	0.00002324
6	Yes	6	0.00000001	0.00000329
7	Yes	6	0.00000001	0.00000392
8	Yes	5	0.00000001	0.00000774
9	Yes	6	0.00000001	0.00000369
10	Yes	6	0.00000001	0.00000339
11	Yes	5	0.00000001	0.00002206
12	Yes	6	0.00000001	0.00000400
13	Yes	6	0.00000001	0.00000335
14	Yes	4	0.00000001	0.00000867
15	Yes	5	0.00000001	0.00005716
16	Yes	5	0.00000001	0.00006958
17	Yes	5	0.00000001	0.00007051
18	Yes	5	0.00000001	0.00005691
19	Yes	5	0.00000001	0.00006740
20	Yes	5	0.00000001	0.00006950
21	Yes	5	0.00000001	0.00005635
22	Yes	5	0.00000001	0.00006869
23	Yes	5	0.00000001	0.00006762
24	Yes	5	0.00000001	0.00005629
25	Yes	5	0.00000001	0.00007011
26	Yes	5	0.00000001	0.00006825
27	Yes	4	0.00000001	0.00005999
28	Yes	5	0.00000001	0.00001035
29	Yes	5	0.00000001	0.00001237
30	Yes	5	0.00000001	0.00000454
31	Yes	5	0.00000001	0.00000914
32	Yes	5	0.00000001	0.00001244
33	Yes	4	0.00000001	0.00005791
34	Yes	5	0.00000001	0.00001089
35	Yes	5	0.00000001	0.00000939

36	Yes	5	0.00000001	0.00000447
37	Yes	5	0.00000001	0.00001310
38	Yes	5	0.00000001	0.00000929

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	27.08	0.00	0.0	39.000	16.3283	-7.82	636.80	0.012
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	42.83	0.00	0.0	39.000	44.7064	-18.55	1743.55	0.011
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	48.21	0.00	0.0	39.000	67.4469	-30.59	2630.43	0.012
L4	41.55 - 0 (4)	TP62x48.1335x0.5	48.47	0.00	0.0	39.000	91.6433	-44.35	3574.09	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	249.96	27.106	39.000	0.695	0.00	0.000	39.000	0.000
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	1176.90	34.156	39.000	0.876	0.00	0.000	39.000	0.000
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	2507.97	37.272	39.000	0.956	0.00	0.000	39.000	0.000
L4	41.55 - 0 (4)	TP62x48.1335x0.5	3780.94	34.772	39.000	0.892	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	18.49	1.132	26.000	0.087	0.75	0.040	26.000	0.002
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	29.99	0.671	26.000	0.052	1.10	0.016	26.000	0.001
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	34.41	0.510	26.000	0.039	2.80	0.020	26.000	0.001
L4	41.55 - 0 (4)	TP62x48.1335x0.5	37.74	0.412	26.000	0.031	2.84	0.013	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

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	150 - 122.92 (1)	0.012	0.695	0.000	0.087	0.002	0.709 ✔	1.333	H1-3+VT ✔
L2	122.92 - 84.26 (2)	0.011	0.876	0.000	0.052	0.001	0.887 ✔	1.333	H1-3+VT ✔
L3	84.26 - 41.55 (3)	0.012	0.956	0.000	0.039	0.001	0.968 ✔	1.333	H1-3+VT ✔
L4	41.55 - 0 (4)	0.012	0.892	0.000	0.031	0.000	0.904 ✔	1.333	H1-3+VT ✔

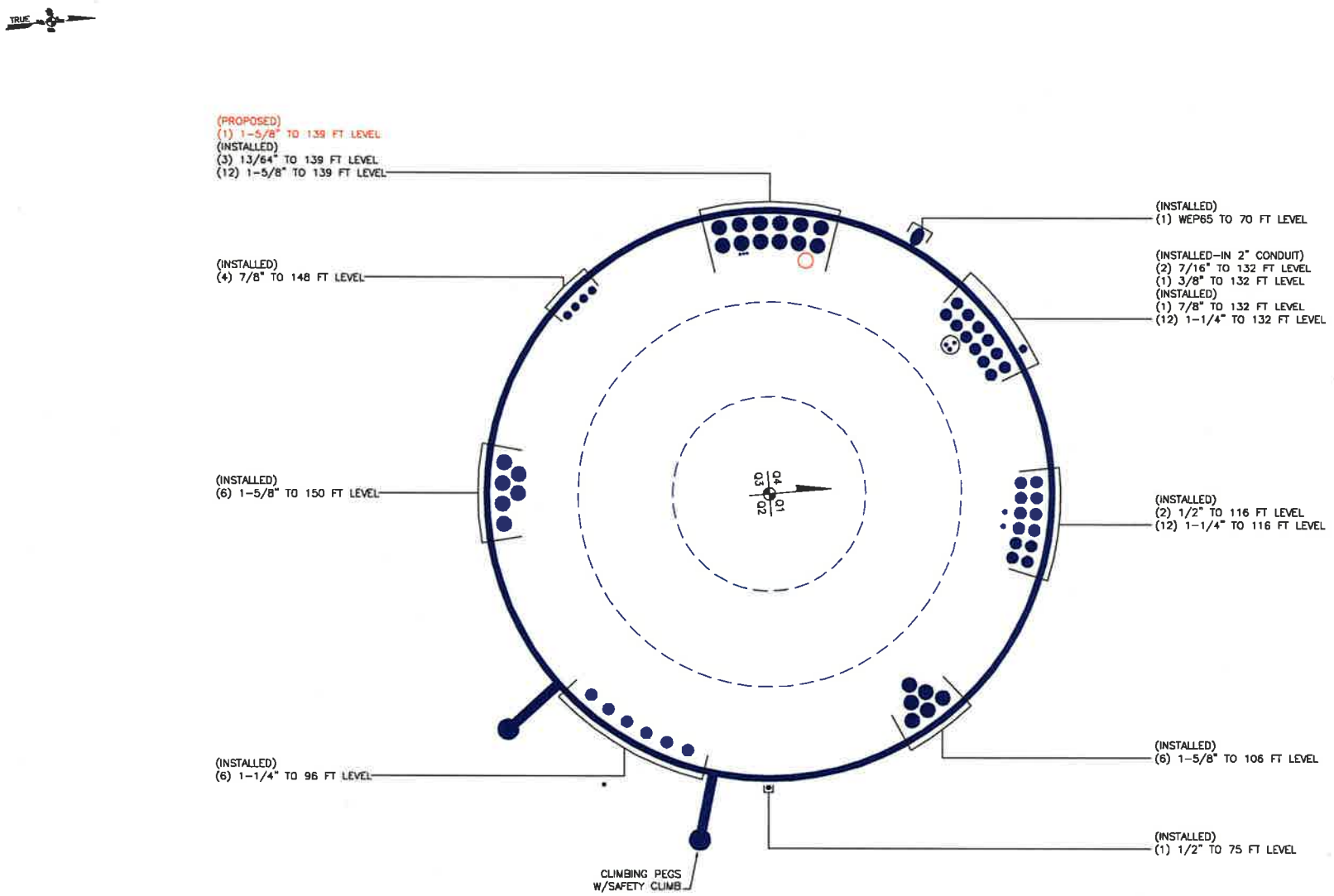
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 122.92	Pole	TP28.83x21x0.1875	1	-7.82	848.86	53.2	Pass
L2	122.92 - 84.26	Pole	TP39.51x27.2493x0.375	2	-18.55	2324.15	66.6	Pass
L3	84.26 - 41.55	Pole	TP50.99x37.1855x0.4375	3	-30.59	3506.36	72.6	Pass
L4	41.55 - 0	Pole	TP62x48.1335x0.5	4	-44.35	4764.26	67.8	Pass

Summary	ELC:	Existing/Proposed/Reserved
Pole (L3)	72.6	Pass
Rating =	72.6	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 800515 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *800515*
Site Name: *CT Chester CAC 800515*
App #: *219488 Rev*

Pole Manufacturer:	*Other*

Reactions		
Moment:	4281	ft-kips
Axial:	49	kips
Shear:	39	kips

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	71	in

Plate Data		
Diam:	77	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.20	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Groove	
Groove Depth:	0.5	in **
Groove Angle:	45	degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:	1	in
Width:	6	in
Height:	16	in
Thick:	1	in
Notch:	1	in
Grade:	65	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	62	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

		Stiffened
Maximum Rod Tension:	118.5 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	60.8% **Pass**	

Base Plate Results

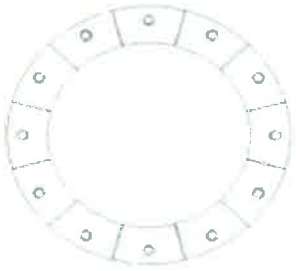
	Flexural Check	Stiffened
Base Plate Stress:	28.5 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	47.5% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	32.4% **Pass**
Vertical Weld:	15.1% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	8.2% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	31.3% **Pass**
Plate Comp. (AISC Bracket):	33.4% **Pass**

Pole Results

Pole Punching Shear Check:	9.0% **Pass**



* 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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *800515*
Site Name: *CT Chester CAC 800515*
App #: *219488 Rev. 0*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	5.167	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	28	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7.5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	44.18	ft^2
Pier Height:	2.67	ft
Soil (above pad) Height:	2.17	ft

Soil Parameters		
Unit Weight, γ:	110.0	pcf
Ultimate Bearing Capacity, qn:	40.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	30.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	52.7	kips
Pad Force Location Above D:	1.30	ft
ϕ(Passive Pressure Moment):	68.21	ft-kips
Factored O.T. M(WL), "1.6W":	6090.9	ft-kips
Factored OT (MW-Msoil), M1	6022.67	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.25	ft
Sum of Soil Wedges Wt:	10.84	kips
Soil Wedges ecc, K1:	7.81	ft
Ftg+Soil above Pad wt:	546.8	kips
Unfactored (Total ftg-soil Wt):	557.66	kips
1.2D. **No Soil Wedges.**	714.99	kips
0.9D. **With Soil Wedges**	546.00	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	49	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	39	kips
Unfactored WL Moment, M:	4281	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	58.8	kips
0.90	0.9D+1.6W, Pu:	44.1	kips
1.35	Vu:	52.65	kips
	Mu:	5779.35	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	714.99	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	6022.67	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.42	ft
Orthogonal qu=	2.29	ksf
qu/ϕ*qn Ratio=	**7.63%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.96	ft
Diagonal qu=	2.76	ksf
qu/ϕ*qn Ratio=	**9.21%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	546.00	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	5946.51	ft-kips

Orthogonal ecc3 = M2/P2 =	10.89	ft
Ortho Non Bearing Length,NBL=	21.78	ft
Orthogonal qu=	3.14	ksf
Diagonal qu=	3.44	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	4281.00		
M Orthogonal:	5410.31	**79.13%**	**Pass**
M Diagonal:	5410.31	**79.13%**	**Pass**

Monopole or Self Support Pad Foundation Reinforcing
BU#: 800515
SSOE Project Number: 014-00546-00

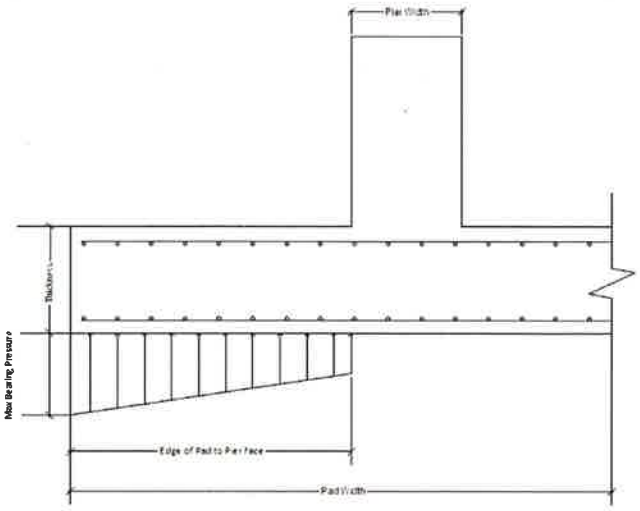
Analysis Code	F
Compression	49 k
Uplift	0 k

Pad Geometry & Reinforcing	
Pad Length	28 ft
Pad Width	28 ft
Pad Thickness	3 ft
Pad Top Rebar Size	# 8
Pad Top Rebar Quantity	24
Pad Bottom Rebar Size	# 8
Pad Bottom Rebar Quantity	49
Clear Cover	4 in
f_c'	3 ksi
Rebar Fy	60 ksi
Minimum Steel Assumed?	NO
Pier Shape	Round
Pier Rebar Size	# 8
Pier Rebar Quantity	51
Pier Diameter	7.5 ft
Anchor Rod Circle	71 in
Anchor Rod Embedment	90 in
Pier Tie Size	# 3

Bearing Calculation	
Max Bearing Pressure	3.14 ksf
Edge of Pad to Pier Face	10.25 ft
Distance Between Piers	0 ft
ecc3 (From Crown Spreadsheet)	10.89
Non-Bearing Length	21.78 ft

Reinforcing Calculations		
Minimum Reinforcement Check		
A_s Min =	0.7776	in^2/ft
As =	2.0596429	in^2/ft
		OK
Punching Shear		
φ (Shear) =	0.75	
V_u =	63.70 k	
ϕV_c =	2523.31 k	
Shear Capacity	2.5%	OK
Pad Flexure		
φ (Tension) =	0.9	
M_u	103.80 k-ft	
ϕM_n =	257.95 k-ft	
Moment Capacity	40.2%	OK
Beam Shear		
V_u	11.97 k	
ϕV_n =	39.99 k	
Shear Capacity	29.9%	OK
Pier Compression		
P_u	63.7 k	
ϕP_n =	12820.23 k	
Compression Capacity	0.5%	OK
Pier Tension		
Pu=	0.00 k	
ϕPn=	2893.63 k	
Tension Capacity =	0.0%	OK
Plain Concrete Interaction		
Moment Capacity	N/A	OK
Shear Capacity	N/A	OK
Pier Compression Capacity	N/A	OK

Overall Capacity	40.2%	OK



SSOE Pad Reinforcement - v2.0