Robinson+Cole

KENNETH C. BALDWIN

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Direct (860) 275-8345

Also admitted in Massachusetts

August 12, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
1394 Meriden Waterbury Turnpike, Southington, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 138-foot level on the existing 160-foot tower at 1394 Meriden Waterbury Turnpike in Southington, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of this tower in 2002. Cellco now intends to modify its facility by adding three (3) model 7420213V01, 2100 MHz antennas, for a total of fifteen (15) antennas, all at the 138-foot level on the tower. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for Cellco's 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 Garry Brumback, Town Manager for the Town of Southington. A copy of this letter is also being sent to Southington Tower Development LLC, the 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. Cellco's new antennas and RRHs will be installed at the 138-foot level of the existing 160-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, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification 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:
Garry Brumback, Southington Town Manager
Southington Tower Development LLC
Sandy M. Carter

ATTACHMENT 1

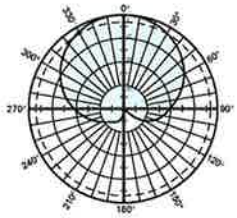
KATHREIN
SCALA DIVISION

742 213V01

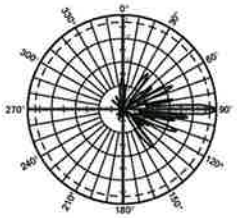
65° Panel Antenna

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° 2° 4° 6° T 18 18 16 15 dB	0° 2° 4° 6° T 18 18 17 16 dB	0° 2° 4° 6° T 18 18 18 18 dB

RoHS Lead-Free

11271-B
936.3740/b

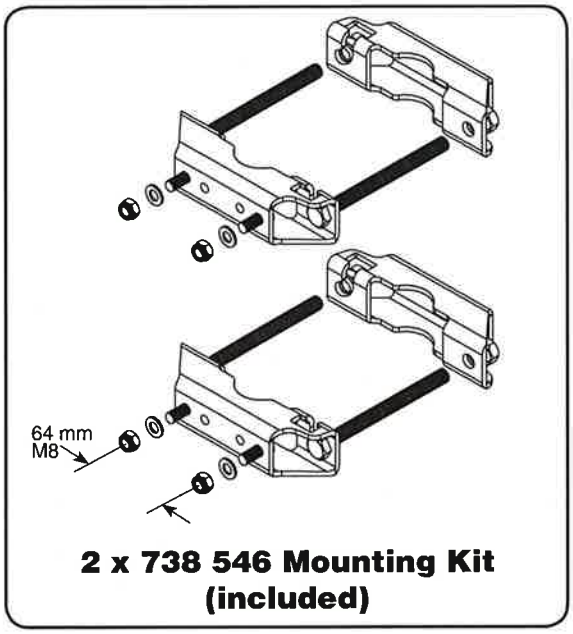
*Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

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

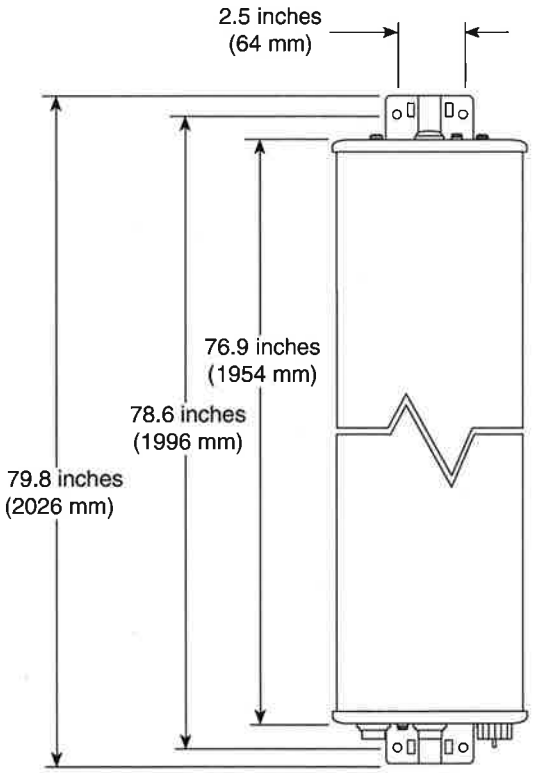
KATHREIN
SCALA DIVISION

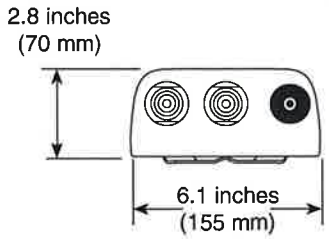
742 213V01

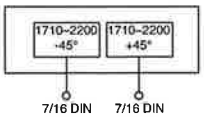
65° Panel Antenna



2 x 738 546 Mounting Kit (included)







Mounting Options:

Model	Description
2 x 738 546 (included)	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast. 4.4 lb (2 kg)
850 10013	Tilt Mount Kit 0–11 degrees downtilt angle. 7.4 lb (3.7 kg)
742 263	Three-panel Sector Mounting Kit (120 deg. ea.) for 3.5 inch (89 mm) OD mast.

Order Information:

Model	Description
742 213V01	Antenna with 7-16 DIN connectors 0°–6° adjustable electrical downtilt

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

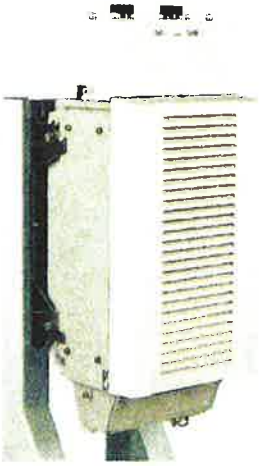
Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

Alcatel·Lucent

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

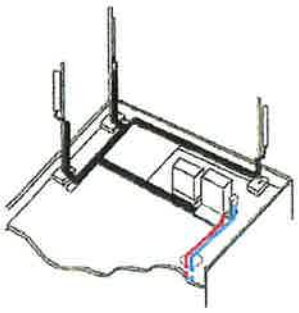
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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

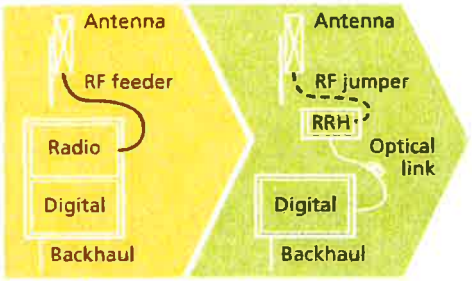
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

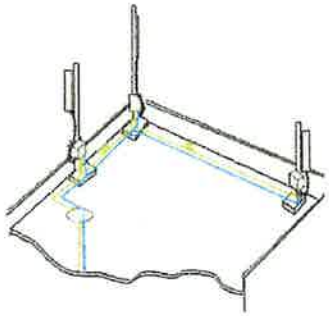
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

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

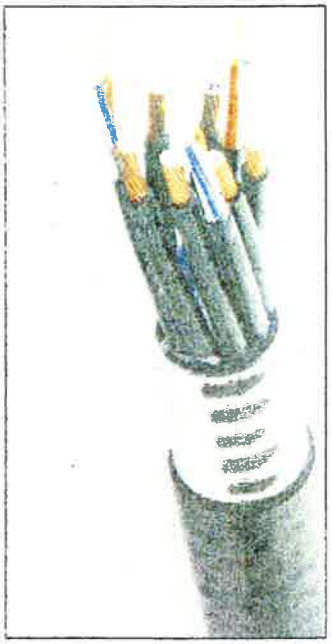


Figure 1: HYBRIFLEX Series

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-93-639 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)

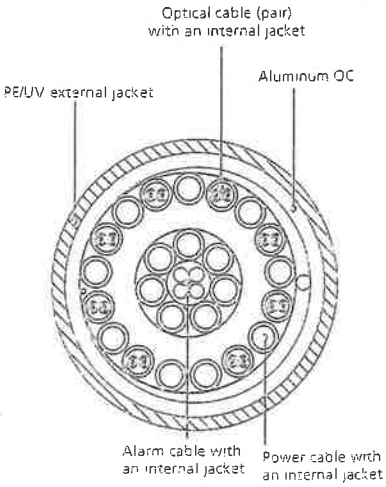


Figure 2: Construction Detail

- This data is provisional and subject to change

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

ATTACHMENT 2

	General	Power	Density					
Site Name: Milldale (Southington)								
Tower Height: 160'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	1077	158	0.0310	1900	1.0000	3.10%	
*AT&T UMTS	2	565	158	0.0163	880	0.5867	2.77%	
*AT&T GSM	1	283	158	0.0041	880	0.5867	0.69%	
*AT&T GSM	4	646	158	0.0372	1900	1.0000	3.72%	
*AT&T LTE	1	1313	158	0.0189	734	0.4893	3.86%	
*MetroPCS CDMA	3	727	119	0.0554	2135	1.0000	5.54%	
*MetroPCS LTE	1	1200	119	0.0305	2130	1.0000	3.05%	
*Sprint CDMA/LTE	5	693	147	0.0577	1900	1.0000	5.77%	
*Sprint CDMA/LTE	1	390	147	0.0065	850	0.5667	1.15%	
*T-Mobile LTE	2	24	128	0.0011	2100	1.0000	0.11%	
*T-Mobile GSM/UMTS	2	12	128	0.0005	1950	1.0000	0.05%	
*T-Mobile UMTS	2	12	128	0.0005	2100	1.0000	0.05%	
Verizon	**11**	**421**	**137**	**0.0887**	**1970**	**1.0000**	**8.87%**	
Verizon	**9**	**393**	**138**	**0.0668**	**869**	**0.5793**	**11.53%**	
Verizon	**1**	**1750**	**138**	**0.0330**	**2145**	**1.0000**	**3.30%**	
Verizon	**1**	**1050**	**138**	**0.0198**	**698**	**0.4973**	**3.99%**	
								57.6%
* Source: Siting Council								

ATTACHMENT 3

Date: **June 05, 2014**

Steve Tuttle
Crown Castle
8 Parkmeadow Drive
Pittsford, NY 14534

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

Subject: **Structural Modification Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	HRT2143
	Carrier Site Name:	Milldale
Crown Castle Designation:	**Crown Castle BU Number:**	876313
	Crown Castle Site Name:	WEST JOHNSON AVE. BURNT HOUSE
	Crown Castle JDE Job Number:	255810
	Crown Castle Work Order Number:	767328
	Crown Castle Application Number:	210679 Rev. 5
Engineering Firm Designation:	**FDH Engineering, Inc. Project Number:**	1466OA1400
Site Data:	**1394 Meriden Waterbury Tpk, SOUTHINGTON, Hartford County, CT**	
	Latitude *41° 33' 51.39"*, Longitude *-72° 53' 30.7"*	
	160 Foot - Monopole Tower	

Dear Steve Tuttle,

FDH Engineering, Inc. is pleased to submit this **"Structural Modification 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 652773, in accordance with application 210679, revision 5.

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:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed **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 Connecticut State Building Code and local code requirements based upon a wind speed of 80 mph fastest mile.

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

We at *FDH Engineering, PC* 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:

Jeff Theberge, EI
Project Engineer

Reviewed by:

Bradley R. Newman, PE
Sr. Project Engineer
CT PE License No. 29630

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by SUMMIT in August of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. This tower has been modified per reinforcement drawings prepared by GPD in 2012 and by PJF in 2013. This tower was again reinforced by FDH Engineering, Inc. in June of 2014. All modifications have been 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 80 mph with no ice, 37.6 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
139.0	140.0	3	alcatel lucent	RRH2X40-AWS	-	-	-
	139.0	1	tower mounts	Side Arm Mount [SO 102-3]			
138.0	138.0	3	kathrein	742 213 w/ Mount Pipe	1	1-5/8	-
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

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
157.0	158.0	3	ericsson	RRUS-11	-	-	2
		1	andrew	SBNH-1D6565C w/ Mount Pipe	6 1 2	1-5/8 3/8 3/4	1
		3	ericsson	RRUS-11			
		3	kathrein	800 10121 w/ Mount Pipe			
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	157.0	1	tower mounts	Side Arm Mount [SO 101-3]			
148.0	148.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	2
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
		1	tower mounts	Platform Mount [LP 712-1]	-	-	1
146.0	146.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	2
		6	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 103-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
138.0	142.0	1	lucent	KS24019-L112A	12 1	1-5/8 1/2	1
	138.0	3	antel	BXA-171063-12BF-EDIN-X w/ Mount Pipe			
		3	antel	BXA-70063-6CF-EDIN-2 w/ Mount Pipe			
		6	antel	LPA-80063-6CF-EDIN-2 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 712-1]			
127.0	128.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	18	1-5/8	1
		6	ems wireless	S20057A-1			
		6	ems wireless	RR65-19-02DPL5 w/ Mount Pipe			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	127.0	1	tower mounts	Platform Mount [LP 712-1]			
119.0	119.0	3	andrew	HBX-6516DS-VTM w/ Mount Pipe	6 1	1-5/8 3/8	1
		1	tower mounts	T-Arm Mount [TA 602-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
133	133	12	generic	Panel Antennas (CaAa = 3.9 Sq Ft)	-	-
118	118	12	generic	Panel Antennas (CaAa = 3.9 Sq Ft)	-	-
98	98	2	ASP	ASP-685	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea	1529743	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford	1633746	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Paul J. Ford	2134246	CCISITES
4-POST-MODIFICATION INSPECTION	TEP	3846956	CCISITES
4-POST-MODIFICATION INSPECTION	TEP	4600286	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD	3348783	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford	4094328	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	FDH Engineering, Inc.	Project No. 1466OA1400	Appendix D

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) Modifications outlined per FDH Engineering, Inc. (Project No. 1466OA1400) Modification Drawings for a 160' Monopole dated June 5, 2014 must be installed as specified for this analysis to be valid.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP10x10x0.322	Pole	12.9%	Pass
155 - 150	Pole	TP10x10x0.322	Pole	34.9%	Pass
150 - 148	Pole	TP10x10x0.322	Pole	44.0%	Pass
148 - 143	Pole	TP23.81x23x0.25	Pole	11.9%	Pass
143 - 138	Pole	TP24.62x23.81x0.25	Pole	17.5%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
138 - 133	Pole	TP25.43x24.62x0.25	Pole	27.3%	Pass
133 - 128	Pole	TP26.24x25.43x0.25	Pole	36.0%	Pass
128 - 123	Pole	TP27.05x26.24x0.25	Pole	46.2%	Pass
123 - 118	Pole	TP27.86x27.05x0.25	Pole	55.9%	Pass
118 - 114.75	Pole	TP28.994x27.86x0.25	Pole	62.0%	Pass
114.75 - 109.75	Pole	TP28.696x27.887x0.3125	Pole	57.3%	Pass
109.75 - 105.25	Pole	TP29.425x28.696x0.3125	Pole	62.7%	Pass
105.25 - 100.25	Pole + Reinf.	TP30.235x29.425x0.4625	Reinf. 5 Tension Rupture	65.1%	Pass
100.25 - 95.25	Pole + Reinf.	TP31.045x30.235x0.4575	Reinf. 5 Tension Rupture	70.5%	Pass
95.25 - 90.25	Pole + Reinf.	TP31.855x31.045x0.4525	Reinf. 5 Tension Rupture	75.4%	Pass
90.25 - 85.25	Pole + Reinf.	TP32.665x31.855x0.4475	Reinf. 5 Tension Rupture	80.1%	Pass
85.25 - 81	Pole + Reinf.	TP34.042x32.665x0.4425	Reinf. 5 Tension Rupture	83.7%	Pass
81 - 75.75	Pole	TP33.579x32.729x0.375	Pole	71.3%	Pass
75.75 - 70.75	Pole	TP34.389x33.579x0.375	Pole	73.8%	Pass
70.75 - 65.75	Pole + Reinf.	TP35.199x34.389x0.55	Reinf. 4 Tension Rupture	78.3%	Pass
65.75 - 60.75	Pole + Reinf.	TP36.009x35.199x0.545	Reinf. 4 Tension Rupture	81.0%	Pass
60.75 - 55.75	Pole + Reinf.	TP36.819x36.009x0.54	Reinf. 4 Tension Rupture	83.5%	Pass
55.75 - 50.75	Pole + Reinf.	TP37.629x36.819x0.535	Reinf. 4 Tension Rupture	85.8%	Pass
50.75 - 48	Pole + Reinf.	TP38.884x37.629x0.535	Reinf. 4 Tension Rupture	87.0%	Pass
48 - 42	Pole + Reinf.	TP38.296x37.324x0.6675	Reinf. 6 Tension Rupture	78.2%	Pass
42 - 37	Pole + Reinf.	TP39.106x38.296x0.6625	Reinf. 6 Tension Rupture	79.9%	Pass
37 - 32	Pole + Reinf.	TP39.916x39.106x0.6575	Reinf. 6 Tension Rupture	81.5%	Pass
32 - 28.25	Pole + Reinf.	TP40.524x39.916x0.6525	Reinf. 6 Tension Rupture	82.6%	Pass
28.25 - 28.08	Pole + Reinf.	TP40.551x40.524x0.7975	Reinf. 6 Tension Rupture	69.7%	Pass
28.08 - 27.25	Pole + Reinf.	TP40.686x40.551x0.8875	Reinf. 6 Tension Rupture	61.8%	Pass
27.25 - 22.25	Pole + Reinf.	TP41.496x40.686x0.6625	Reinf. 2 Tension Rupture	77.7%	Pass
22.25 - 17.25	Pole + Reinf.	TP42.306x41.496x0.6525	Reinf. 2 Tension Rupture	78.9%	Pass
17.25 - 16	Pole + Reinf.	TP42.508x42.306x0.6525	Reinf. 2 Tension Rupture	79.2%	Pass
16 - 14.58	Pole + Reinf.	TP42.738x42.508x0.8025	Reinf. 7 Tension Rupture	70.2%	Pass
14.58 - 12.25	Pole + Reinf.	TP43.116x42.738x0.7125	Reinf. 7 Tension Rupture	80.6%	Pass
12.25 - 10	Pole + Reinf.	TP43.48x43.116x0.8175	Reinf. 7 Tension Rupture	72.2%	Pass
10 - 5	Pole + Reinf.	TP44.29x43.48x0.7225	Reinf. 2 Tension Rupture	74.3%	Pass
5 - 0	Pole + Reinf.	TP45.1x44.29x0.7175	Reinf. 2 Tension Rupture	75.3%	Pass
				Summary	
			Pole	75.5%	Pass
			Reinforcement	87.0%	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	99.5	Pass
1	Base Plate	0	90.4	Pass
1	Base Foundation	0	83.4	Pass
1	Base Foundation Soil Interaction	0	74.1	Pass

Structure Rating (max from all components) =	99.5%

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

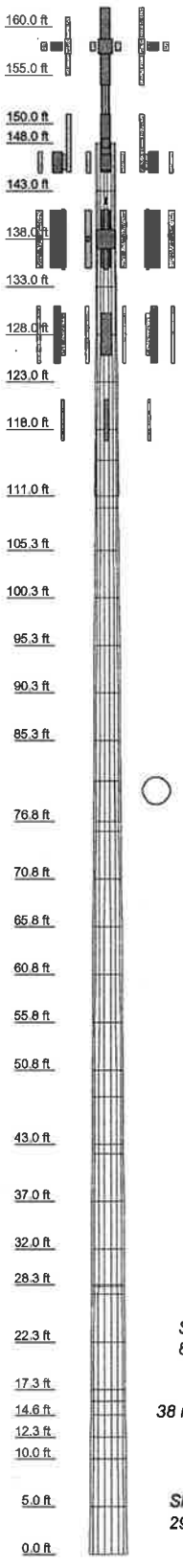
4.1) Recommendations

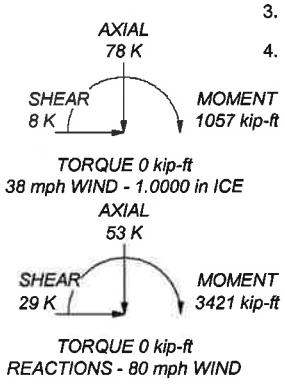
The tower and its foundation have sufficient capacity to carry the existing, proposed, and reserved equipment once the modifications outlined per FDH Engineering, Inc. (Project No. 1466OA1400) Modification Drawings for a 160' Monopole dated June 5, 2014 are installed as specified.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Length (ft)	5.000	5.000	0.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	4.500	5.000	5.000	5.000	5.000	5.000	5.250	5.000	5.000	5.000	5.000	5.000	6.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Number of Sides	0	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.3220	0.3220	0.3220	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.3125	0.3125	0.4625	0.4575	0.4525	0.4475	0.4425	0.4375	0.3750	0.5500	0.5450	0.5400	0.5350	0.5300	0.5250	0.6625	0.6575	0.6525	0.6475	0.6425	0.6375	0.6325	0.6275	0.6225	0.6175	0.7225	0.7175	0.7125
Socket Length (ft)										3.750							4.250							5.000															
Top Dia (in)	10.0000	10.0000	10.0000	23.6100	24.0200	24.4300	25.2400	26.0500	27.8600	28.2700	28.6800	29.0900	30.2350	31.0452	31.8552	32.6651	33.4751	34.2851	34.8889	35.1988	36.0088	36.8187	37.6286	38.4386	39.2486	40.0585	40.8685	41.6784	42.4884	43.2984	44.1083	44.9183	45.7282	46.5382	47.3481	48.1581	48.9680	49.7780
Bot Dia (in)	10.0000	10.0000	10.0000	23.6100	24.0200	24.4300	25.2400	26.0500	27.8600	28.2700	28.6800	29.0900	30.2350	31.0452	31.8552	32.6651	33.4751	34.2851	34.8889	35.1988	36.0088	36.8187	37.6286	38.4386	39.2486	40.0585	40.8685	41.6784	42.4884	43.2984	44.1083	44.9183	45.7282	46.5382	47.3481	48.1581	48.9680	49.7780
Grade	A53-B-35									A572-60															A572-65														
Weight (K)	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.7	0.7	0.7	0.7	1.3	0.7	0.7	1.0	1.0	1.0	1.0	1.6	1.6	1.3	1.3	1.0	1.0	1.4	1.4	0.9	0.9	0.4	0.4	0.9	1.6	1.6





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Side Arm Mount [SO 101-3]	157	(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	138
800 10121 w/ Mount Pipe	157	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	138
800 10121 w/ Mount Pipe	157	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	138
800 10121 w/ Mount Pipe	157	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	138
AM-X-CD-16-65-00T-RET w/ Mount Pipe	157	BXA-171063-12BF-EDIN-X w/ Mount Pipe	138
DC6-48-60-18-8F	157	BXA-171063-12BF-EDIN-X w/ Mount Pipe	138
P65-17-XLH-RR w/ Mount Pipe	157	BXA-171063-12BF-EDIN-X w/ Mount Pipe	138
SBNH-1D6565C w/ Mount Pipe	157	KS24019-L112A	138
(2) LGP21401	157	(2) FD9R6004/2C-3L	138
(2) LGP21401	157	(2) FD9R6004/2C-3L	138
(2) LGP21401	157	(2) FD9R6004/2C-3L	138
RRUS-11	157	742 213 w/ Mount Pipe	138
RRUS-11	157	742 213 w/ Mount Pipe	138
RRUS-11	157	742 213 w/ Mount Pipe	138
RRUS-11	157	DB-T1-6Z-8AB-0Z	138
Platform Mount [LP 712-1]	148	Platform Mount [LP 712-1]	127
APXVSPP18-C-A20 w/ Mount Pipe	148	(2) RR65-19-02DPL5 w/ Mount Pipe	127
APXVSPP18-C-A20 w/ Mount Pipe	148	(2) RR65-19-02DPL5 w/ Mount Pipe	127
APXVSPP18-C-A20 w/ Mount Pipe	148	(2) RR65-19-02DPL5 w/ Mount Pipe	127
IBC1900BB-1	148	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	127
IBC1900BB-1	148	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	127
IBC1900BB-1	148	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	127
IBC1900HG-2A	148	(2) S20057A-1	127
IBC1900HG-2A	148	(2) S20057A-1	127
IBC1900HG-2A	148	(2) S20057A-1	127
(2) Empty Pipe Mount	148	ONEBASE TWIN DUAL DUPLEX TMA	127
(2) Empty Pipe Mount	148	ONEBASE TWIN DUAL DUPLEX TMA	127
(2) Empty Pipe Mount	148	ONEBASE TWIN DUAL DUPLEX TMA	127
Side Arm Mount [SO 103-3]	146	T-Arm Mount [TA 602-3]	119
(2) PCS 1900MHz 4x45W-65MHz	146	Empty Pipe Mount	119
(2) PCS 1900MHz 4x45W-65MHz	146	Empty Pipe Mount	119
(2) PCS 1900MHz 4x45W-65MHz	146	Empty Pipe Mount	119
800MHz 2X50W RRH W/FILTER	146	HBX-6516DS-VTM w/ Mount Pipe	119
800MHz 2X50W RRH W/FILTER	146	HBX-6516DS-VTM w/ Mount Pipe	119
800MHz 2X50W RRH W/FILTER	146	HBX-6516DS-VTM w/ Mount Pipe	119
Side Arm Mount [SO 102-3]	139		
RRH2X40-AWS	139		
RRH2X40-AWS	139		
RRH2X40-AWS	139		
Platform Mount [LP 712-1]	138		
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	138		
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	138		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi
A572-60	60 ksi	75 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 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.

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031
Tower Analysis

Job: West Johnson Ave BU876313			
Project: 1466OA1400			
Client: Crown Castle	Drawn by: Jeff Theberge	App'd:	
Code: TIA/EIA-222-F	Date: 06/04/14	Scale: NTS	
Path:		Dwg No. E-1	

tnxTower	Job	Page
	West Johnson Ave BU876313	1 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Project 1466OA1400	Date 15:14:35 06/04/14
	Client Crown Castle	Designed by Jeff Theberge

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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °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	160.000-155.000	5.000	0.000	Round	10.0000	10.0000	0.3220		A53-B-35 (35 ksi)
L2	155.000-150.000	5.000	0.000	Round	10.0000	10.0000	0.3220		A53-B-35 (35 ksi)
L3	150.000-148.000	2.000	0.000	Round	10.0000	10.0000	0.3220		A53-B-35 (35 ksi)
L4	148.000-143.000	5.000	0.000	18	23.0000	23.8100	0.2500	1.0000	A572-60 (60 ksi)
L5	143.000-138.000	5.000	0.000	18	23.8100	24.6200	0.2500	1.0000	A572-60

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
	0								(60 ksi)
L6	138.000-133.00	5.000	0.000	18	24.6200	25.4300	0.2500	1.0000	A572-60
	0								(60 ksi)
L7	133.000-128.00	5.000	0.000	18	25.4300	26.2400	0.2500	1.0000	A572-60
	0								(60 ksi)
L8	128.000-123.00	5.000	0.000	18	26.2400	27.0500	0.2500	1.0000	A572-60
	0								(60 ksi)
L9	123.000-118.00	5.000	0.000	18	27.0500	27.8600	0.2500	1.0000	A572-60
	0								(60 ksi)
L10	118.000-111.00	7.000	3.750	18	27.8600	28.9940	0.2500	1.0000	A572-60
	0								(60 ksi)
L11	111.000-109.75	5.000	0.000	18	27.8865	28.6964	0.3125	1.2500	A572-60
	0								(60 ksi)
L12	109.750-105.25	4.500	0.000	18	28.6964	29.4254	0.3125	1.2500	A572-60
	0								(60 ksi)
L13	105.250-100.25	5.000	0.000	18	29.4254	30.2353	0.4625	1.8500	A572-60
	0								(60 ksi)
L14	100.250-95.250	5.000	0.000	18	30.2353	31.0452	0.4575	1.8300	A572-60
									(60 ksi)
L15	95.250-90.250	5.000	0.000	18	31.0452	31.8552	0.4525	1.8100	A572-60
									(60 ksi)
L16	90.250-85.250	5.000	0.000	18	31.8552	32.6651	0.4475	1.7900	A572-60
									(60 ksi)
L17	85.250-76.750	8.500	4.250	18	32.6651	34.0420	0.4425	1.7700	A572-60
									(60 ksi)
L18	76.750-75.750	5.250	0.000	18	32.7286	33.5790	0.3750	1.5000	A572-65
									(65 ksi)
L19	75.750-70.750	5.000	0.000	18	33.5790	34.3889	0.3750	1.5000	A572-65
									(65 ksi)
L20	70.750-65.750	5.000	0.000	18	34.3889	35.1988	0.5500	2.2000	A572-65
									(65 ksi)
L21	65.750-60.750	5.000	0.000	18	35.1988	36.0088	0.5450	2.1800	A572-65
									(65 ksi)
L22	60.750-55.750	5.000	0.000	18	36.0088	36.8187	0.5400	2.1600	A572-65
									(65 ksi)
L23	55.750-50.750	5.000	0.000	18	36.8187	37.6286	0.5350	2.1400	A572-65
									(65 ksi)
L24	50.750-43.000	7.750	5.000	18	37.6286	38.8840	0.5350	2.1400	A572-65
									(65 ksi)
L25	43.000-42.000	6.000	0.000	18	37.3241	38.2961	0.6675	2.6700	A572-65
									(65 ksi)
L26	42.000-37.000	5.000	0.000	18	38.2961	39.1061	0.6625	2.6500	A572-65
									(65 ksi)
L27	37.000-32.000	5.000	0.000	18	39.1061	39.9160	0.6575	2.6300	A572-65
									(65 ksi)
L28	32.000-28.250	3.750	0.000	18	39.9160	40.5235	0.6525	2.6100	A572-65
									(65 ksi)
L29	28.250-28.080	0.170	0.000	18	40.5235	40.5511	0.7975	3.1900	A572-65
									(65 ksi)
L30	28.080-27.250	0.830	0.000	18	40.5511	40.6855	0.8875	3.5500	A572-65
									(65 ksi)
L31	27.250-22.250	5.000	0.000	18	40.6855	41.4955	0.6625	2.6500	A572-65
									(65 ksi)
L32	22.250-17.250	5.000	0.000	18	41.4955	42.3055	0.6525	2.6100	A572-65
									(65 ksi)
L33	17.250-16.000	1.250	0.000	18	42.3055	42.5080	0.6525	2.6100	A572-65
									(65 ksi)
L34	16.000-14.580	1.420	0.000	18	42.5080	42.7381	0.8025	3.2100	A572-65
									(65 ksi)
L35	14.580-12.250	2.330	0.000	18	42.7381	43.1155	0.7125	2.8500	A572-65
									(65 ksi)

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
L36	12.250-10.000	2.250	0.000	18	43.1155	43.4800	0.8175	3.2700	A572-65 (65 ksi)
L37	10.000-5.000	5.000	0.000	18	43.4800	44.2900	0.7225	2.8900	A572-65 (65 ksi)
L38	5.000-0.000	5.000		18	44.2900	45.1000	0.7175	2.8700	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	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
L2	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
L3	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
	10.0000	9.7902	114.7501	3.4236	5.0000	22.9500	229.5002	4.8922	0.0000	0
L4	23.3548	18.0521	1180.3983	8.0762	11.6840	101.0269	2362.3498	9.0278	3.6080	14.432
	24.1773	18.6949	1311.0228	8.3638	12.0955	108.3895	2623.7706	9.3492	3.7506	15.002
L5	24.1773	18.6949	1311.0228	8.3638	12.0955	108.3895	2623.7706	9.3492	3.7506	15.002
	24.9998	19.3376	1450.9451	8.6514	12.5070	116.0110	2903.7993	9.6706	3.8931	15.572
L6	24.9998	19.3376	1450.9451	8.6514	12.5070	116.0110	2903.7993	9.6706	3.8931	15.572
	25.8223	19.9803	1600.4848	8.9389	12.9184	123.8915	3203.0756	9.9921	4.0357	16.143
L7	25.8223	19.9803	1600.4848	8.9389	12.9184	123.8915	3203.0756	9.9921	4.0357	16.143
	26.6448	20.6231	1759.9617	9.2264	13.3299	132.0309	3522.2392	10.3135	4.1782	16.713
L8	26.6448	20.6231	1759.9617	9.2264	13.3299	132.0309	3522.2392	10.3135	4.1782	16.713
	27.4673	21.2658	1929.6954	9.5140	13.7414	140.4293	3861.9300	10.6349	4.3208	17.283
L9	27.4673	21.2658	1929.6954	9.5140	13.7414	140.4293	3861.9300	10.6349	4.3208	17.283
	28.2898	21.9085	2110.0056	9.8016	14.1529	149.0867	4222.7875	10.9563	4.4634	17.853
L10	28.2898	21.9085	2110.0056	9.8016	14.1529	149.0867	4222.7875	10.9563	4.4634	17.853
	29.4413	22.8084	2380.8169	10.2041	14.7290	161.6420	4764.7665	11.4063	4.6629	18.652
L11	28.9335	27.3500	2627.2035	9.7888	14.1663	185.4539	5257.8639	13.6776	4.3580	13.946
	29.1391	28.1533	2865.5776	10.0763	14.5778	196.5715	5734.9257	14.0793	4.5006	14.402
L12	29.1391	28.1533	2865.5776	10.0763	14.5778	196.5715	5734.9257	14.0793	4.5006	14.402
	29.8793	28.8763	3092.0726	10.3351	14.9481	206.8540	6188.2138	14.4409	4.6289	14.812
L13	29.8793	42.5168	4505.8955	10.2818	14.9481	301.4362	9017.7201	21.2624	4.3649	9.438
	30.7017	43.7057	4894.5814	10.5693	15.3595	318.6672	9795.6032	21.8570	4.5074	9.746
L14	30.7017	43.2405	4844.1067	10.5711	15.3595	315.3810	9694.5874	21.6244	4.5162	9.872
	31.5242	44.4166	5250.2234	10.8586	15.7710	332.9040	10507.3553	22.2125	4.6588	10.183
L15	31.5242	43.9384	5195.3909	10.8604	15.7710	329.4272	10397.6180	21.9734	4.6676	10.315
	32.3466	45.1016	5619.0513	11.1480	16.1824	347.2316	11245.4963	22.5551	4.8101	10.63
L16	32.3466	44.6104	5559.6172	11.1497	16.1824	343.5589	11126.5498	22.3094	4.8189	10.769
	33.1690	45.7608	6000.9146	11.4373	16.5939	361.6343	12009.7254	22.8847	4.9615	11.087
L17	33.1690	45.2565	5936.6284	11.4390	16.5939	357.7602	11881.0684	22.6325	4.9703	11.232
	34.5672	47.1903	6730.6358	11.9278	17.2933	389.2040	13470.1280	23.5996	5.2126	11.78
L18	33.9325	38.5088	5092.6250	11.4855	16.6261	306.3029	10191.9511	19.2581	5.1002	13.601
	34.0970	39.5210	5504.8569	11.7874	17.0581	322.7118	11016.9573	19.7643	5.2499	14
L19	34.0970	39.5210	5504.8569	11.7874	17.0581	322.7118	11016.9573	19.7643	5.2499	14
	34.9194	40.4851	5917.5939	12.0749	17.4696	338.7374	11842.9744	20.2464	5.3924	14.38
L20	34.9194	59.0726	8545.8645	12.0128	17.4696	489.1859	17102.9739	29.5419	5.0844	9.244
	35.7418	60.4865	9174.2990	12.3003	17.8810	513.0751	18360.6698	30.2490	5.2270	9.504
L21	35.7418	59.9452	9094.8324	12.3021	17.8810	508.6309	18201.6321	29.9783	5.2358	9.607
	36.5643	61.3463	9747.5439	12.5896	18.2924	532.8725	19507.9139	30.6790	5.3783	9.869
L22	36.5643	60.7920	9662.2025	12.5914	18.2924	528.2071	19337.1189	30.4018	5.3871	9.976
	37.3867	62.1802	10339.3395	12.8789	18.7039	552.7908	20692.2838	31.0960	5.5297	10.24
L23	37.3867	61.6130	10247.8409	12.8807	18.7039	547.8988	20509.1661	30.8123	5.5385	10.352

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
	38.2091	62.9883	10949.5325	13.1682	19.1153	572.8140	21913.4727	31.5001	5.6810	10.619
L24	38.2091	62.9883	10949.5325	13.1682	19.1153	572.8140	21913.4727	31.5001	5.6810	10.619
	39.4838	65.1201	12099.3011	13.6139	19.7531	612.5276	24214.5228	32.5662	5.9020	11.032
L25	38.7223	77.6623	13184.1225	13.0131	18.9606	695.3420	26385.5930	38.8385	5.3942	8.081
	38.8868	79.7216	14260.9539	13.3581	19.4544	733.0452	28540.6728	39.8684	5.5653	8.338
L26	38.8868	79.1349	14159.7734	13.3599	19.4544	727.8442	28338.1786	39.5750	5.5741	8.414
	39.7093	80.8381	15093.8812	13.6475	19.8659	759.7893	30207.6233	40.4268	5.7167	8.629
L27	39.7093	80.2385	14985.8108	13.6492	19.8659	754.3493	29991.3402	40.1269	5.7255	8.708
	40.5318	81.9289	15953.0180	13.9368	20.2774	786.7407	31927.0273	40.9722	5.8680	8.925
L28	40.5318	81.3162	15837.7520	13.9386	20.2774	781.0562	31696.3437	40.6658	5.8768	9.007
	41.1487	82.5743	16584.3204	14.1542	20.5860	805.6132	33190.4629	41.2950	5.9837	9.17
L29	41.1487	100.5571	20049.3820	14.1027	20.5860	973.9348	40125.1455	50.2881	5.7285	7.183
	41.1766	100.6269	20091.1081	14.1125	20.6000	975.2989	40208.6527	50.3230	5.7334	7.189
L30	41.1766	111.7293	22206.9318	14.0806	20.6000	1078.0090	44443.0840	55.8753	5.5750	6.282
	41.3132	112.1081	22433.5414	14.1283	20.6683	1085.4105	44896.6014	56.0647	5.5987	6.308
L31	41.3132	84.1595	17031.7990	14.2082	20.6683	824.0560	34086.0089	42.0877	5.9947	9.049
	42.1357	85.8627	18086.9444	14.4957	21.0797	858.0254	36197.6880	42.9395	6.1372	9.264
L32	42.1357	84.5874	17827.0250	14.4993	21.0797	845.6951	35677.5072	42.3017	6.1548	9.433
	42.9582	86.2649	18908.8262	14.7868	21.4912	879.8401	37842.5331	43.1406	6.2974	9.651
L33	42.9582	86.2649	18908.8262	14.7868	21.4912	879.8401	37842.5331	43.1406	6.2974	9.651
	43.1638	86.6843	19185.9474	14.8587	21.5941	888.4820	38397.1403	43.3504	6.3330	9.706
L34	43.1638	106.2296	23343.7257	14.8055	21.5941	1081.0245	46718.1678	53.1249	6.0690	7.563
	43.3974	106.8155	23732.1357	14.8871	21.7109	1093.0959	47495.4988	53.4179	6.1095	7.613
L35	43.3974	95.0398	21206.5411	14.9191	21.7109	976.7677	42440.9862	47.5289	6.2679	8.797
	43.7806	95.8934	21783.0940	15.0531	21.9027	994.5400	43594.8509	47.9558	6.3343	8.89
L36	43.7806	109.7526	24808.0260	15.0158	21.9027	1132.6478	49648.6949	54.8867	6.1495	7.522
	44.1508	110.6983	25454.9063	15.1452	22.0878	1152.4394	50943.3069	55.3597	6.2137	7.601
L37	44.1508	98.0522	22647.4652	15.1789	22.0878	1025.3360	45324.7306	49.0354	6.3809	8.832
	44.9733	99.9097	23959.0929	15.4665	22.4993	1064.8806	47949.7118	49.9643	6.5234	9.029
L38	44.9733	99.2296	23801.4788	15.4682	22.4993	1057.8753	47634.2763	49.6242	6.5322	9.104
	45.7957	101.0743	25153.6818	15.7558	22.9108	1097.8963	50340.4615	50.5467	6.6748	9.303

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 160.000-155.000				1	1	1		
L2 155.000-150.000				1	1	1		
L3 150.000-148.000				1	1	1		
L4 148.000-143.000				1	1	1		
L5 143.000-138.000				1	1	1		
L6 138.000-133.000				1	1	1		
L7 133.000-128.000				1	1	1		
L8 128.000-123.000				1	1	1		

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
L9 123.000-118.000				1	1	1		
L10 118.000-111.000				1	1	1		
L11 111.000-109.750				1	1	1		
L12 109.750-105.250				1	1	1		
L13 105.250-100.250				1	1	0.962577		
L14 100.250-95.250				1	1	0.965258		
L15 95.250-90.250				1	1	0.968409		
L16 90.250-85.250				1	1	0.972016		
L17 85.250-76.750				1	1	0.97706		
L18 76.750-75.750				1	1	1		
L19 75.750-70.750				1	1	1		
L20 70.750-65.750				1	1	0.9655		
L21 65.750-60.750				1	1	0.967682		
L22 60.750-55.750				1	1	0.970207		
L23 55.750-50.750				1	1	0.973065		
L24 50.750-43.000				1	1	0.969836		
L25 43.000-42.000				1	1	0.9652		
L26 42.000-37.000				1	1	0.965782		
L27 37.000-32.000				1	1	0.966653		
L28 32.000-28.250				1	1	0.969313		
L29 28.250-28.080				1	1	0.964148		
L30 28.080-27.250				1	1	0.942628		
L31 27.250-22.250				1	1	0.959965		
L32 22.250-17.250				1	1	0.968527		
L33 17.250-16.000				1	1	0.967086		
L34 16.000-14.580				1	1	0.956333		
L35				1	1	0.982394		

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
14.580-12.250								
L36				1	1	1.00861		
12.250-10.000								
L37				1	1	0.948616		
10.000-5.000								
L38				1	1	0.948814		
5.000-0.000								

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8")	C	No	Inside Pole	157.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-002-75000(3/8")	C	No	Inside Pole	157.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	157.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
**								
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	148.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
**								
AL7-50(1 5/8)	C	No	Inside Pole	138.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF4-50A(1/2")	C	No	Inside Pole	138.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	138.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
						1" Ice	0.398	0.005
						2" Ice	0.598	0.011
						4" Ice	0.998	0.031
**								
LDF7-50A(1-5/8")	C	No	Inside Pole	127.000 - 0.000	13	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						4" Ice	0.000	0.001
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
**								
FXL-1873(1 5/8")	C	No	CaAa (Out Of Face)	119.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
860 10033(3/8)	C	No	CaAa (Out Of Face)	119.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
**								
LDF4-50A(1/2")	C	No	Inside Pole	48.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
**								
Aero MP306	A	No	Inside Pole	15.500 - 0.500	1	No Ice	0.000	0.029
						1/2" Ice	0.000	0.029
						1" Ice	0.000	0.029
						2" Ice	0.000	0.029
						4" Ice	0.000	0.029
Aero MP306	B	No	Inside Pole	15.500 - 0.500	1	No Ice	0.000	0.029
						1/2" Ice	0.000	0.029
						1" Ice	0.000	0.029
						2" Ice	0.000	0.029
						4" Ice	0.000	0.029
Aero MP306	C	No	Inside Pole	30.500 - 0.500	1	No Ice	0.000	0.029
						1/2" Ice	0.000	0.029
						1" Ice	0.000	0.029
						2" Ice	0.000	0.029
						4" Ice	0.000	0.029
Aero MP306	A	No	Inside Pole	30.500 - 0.500	1	No Ice	0.000	0.029
						1/2" Ice	0.000	0.029
						1" Ice	0.000	0.029
						2" Ice	0.000	0.029
						4" Ice	0.000	0.029
Aero MP306	C	No	Inside Pole	31.300 - 11.300	1	No Ice	0.000	0.029
						1/2" Ice	0.000	0.029
						1" Ice	0.000	0.029
						2" Ice	0.000	0.029
						4" Ice	0.000	0.029
Aero MP305	A	No	Inside Pole	73.000 - 43.000	1	No Ice	0.000	0.019
						1/2" Ice	0.000	0.019
						1" Ice	0.000	0.019
						2" Ice	0.000	0.019
						4" Ice	0.000	0.019
Aero MP305	B	No	Inside Pole	73.000 - 43.000	1	No Ice	0.000	0.019
						1/2" Ice	0.000	0.019

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.000	0.019
						2" Ice	0.000	0.019
						4" Ice	0.000	0.019
Aero MP305	C	No	Inside Pole	73.000 - 43.000	1	No Ice	0.000	0.019
						1/2" Ice	0.000	0.019
						1" Ice	0.000	0.019
						2" Ice	0.000	0.019
						4" Ice	0.000	0.019
Aero MP304	A	No	Inside Pole	106.750 - 76.750	1	No Ice	0.000	0.014
						1/2" Ice	0.000	0.014
						1" Ice	0.000	0.014
						2" Ice	0.000	0.014
						4" Ice	0.000	0.014
Aero MP304	B	No	Inside Pole	106.750 - 76.750	1	No Ice	0.000	0.014
						1/2" Ice	0.000	0.014
						1" Ice	0.000	0.014
						2" Ice	0.000	0.014
						4" Ice	0.000	0.014
Aero MP304	C	No	Inside Pole	106.750 - 76.750	1	No Ice	0.000	0.014
						1/2" Ice	0.000	0.014
						1" Ice	0.000	0.014
						2" Ice	0.000	0.014
						4" Ice	0.000	0.014
**								
6.5" x 1.25" Flat Plate (F)	A	No	Inside Pole	49.500 - 24.500	1	No Ice	0.000	0.028
						1/2" Ice	0.000	0.028
						1" Ice	0.000	0.028
						2" Ice	0.000	0.028
						4" Ice	0.000	0.028
6.5" x 1.25" Flat Plate (F)	B	No	Inside Pole	49.500 - 24.500	1	No Ice	0.000	0.028
						1/2" Ice	0.000	0.028
						1" Ice	0.000	0.028
						2" Ice	0.000	0.028
						4" Ice	0.000	0.028
6.5" x 1.25" Flat Plate (F)	C	No	Inside Pole	49.500 - 24.500	1	No Ice	0.000	0.028
						1/2" Ice	0.000	0.028
						1" Ice	0.000	0.028
						2" Ice	0.000	0.028
						4" Ice	0.000	0.028
**								
6" x 1" Flat Plate (F)	A	No	Inside Pole	18.000 - 8.000	1	No Ice	0.000	0.020
						1/2" Ice	0.000	0.020
						1" Ice	0.000	0.020
						2" Ice	0.000	0.020
						4" Ice	0.000	0.020
6" x 1" Flat Plate (F)	B	No	Inside Pole	18.000 - 8.000	1	No Ice	0.000	0.020
						1/2" Ice	0.000	0.020
						1" Ice	0.000	0.020
						2" Ice	0.000	0.020
						4" Ice	0.000	0.020
6" x 1" Flat Plate (F)	C	No	Inside Pole	18.000 - 8.000	1	No Ice	0.000	0.020
						1/2" Ice	0.000	0.020
						1" Ice	0.000	0.020
						2" Ice	0.000	0.020
						4" Ice	0.000	0.020

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	160.000-155.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.012
L2	155.000-150.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.031
L3	150.000-148.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.012
L4	148.000-143.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.047
L5	143.000-138.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.047
L6	138.000-133.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.990	0.085
L7	133.000-128.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.990	0.085
L8	128.000-123.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.782	0.144
L9	123.000-118.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.980	0.163
L10	118.000-111.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	2.772	0.251
L11	111.000-109.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.495	0.045
L12	109.750-105.250	A	0.000	0.000	0.000	0.000	0.021
		B	0.000	0.000	0.000	0.000	0.021
		C	0.000	0.000	0.000	1.782	0.182
L13	105.250-100.250	A	0.000	0.000	0.000	0.000	0.070
		B	0.000	0.000	0.000	0.000	0.070
		C	0.000	0.000	0.000	1.980	0.250
L14	100.250-95.250	A	0.000	0.000	0.000	0.000	0.070
		B	0.000	0.000	0.000	0.000	0.070
		C	0.000	0.000	0.000	1.980	0.250
L15	95.250-90.250	A	0.000	0.000	0.000	0.000	0.070
		B	0.000	0.000	0.000	0.000	0.070
		C	0.000	0.000	0.000	1.980	0.250
L16	90.250-85.250	A	0.000	0.000	0.000	0.000	0.070
		B	0.000	0.000	0.000	0.000	0.070
		C	0.000	0.000	0.000	1.980	0.250
L17	85.250-76.750	A	0.000	0.000	0.000	0.000	0.119
		B	0.000	0.000	0.000	0.000	0.119
		C	0.000	0.000	0.000	3.366	0.424
L18	76.750-75.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.396	0.036
L19	75.750-70.750	A	0.000	0.000	0.000	0.000	0.043
		B	0.000	0.000	0.000	0.000	0.043
		C	0.000	0.000	0.000	1.980	0.223
L20	70.750-65.750	A	0.000	0.000	0.000	0.000	0.096
		B	0.000	0.000	0.000	0.000	0.096
		C	0.000	0.000	0.000	1.980	0.275
L21	65.750-60.750	A	0.000	0.000	0.000	0.000	0.096

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.096
		C	0.000	0.000	0.000	1.980	0.275
L22	60.750-55.750	A	0.000	0.000	0.000	0.000	0.096
		B	0.000	0.000	0.000	0.000	0.096
		C	0.000	0.000	0.000	1.980	0.275
L23	55.750-50.750	A	0.000	0.000	0.000	0.000	0.096
		B	0.000	0.000	0.000	0.000	0.096
		C	0.000	0.000	0.000	1.980	0.275
L24	50.750-43.000	A	0.000	0.000	0.000	0.000	0.329
		B	0.000	0.000	0.000	0.000	0.329
		C	0.000	0.000	0.000	3.069	0.607
L25	43.000-42.000	A	0.000	0.000	0.000	0.000	0.028
		B	0.000	0.000	0.000	0.000	0.028
		C	0.000	0.000	0.000	0.396	0.064
L26	42.000-37.000	A	0.000	0.000	0.000	0.000	0.138
		B	0.000	0.000	0.000	0.000	0.138
		C	0.000	0.000	0.000	1.980	0.318
L27	37.000-32.000	A	0.000	0.000	0.000	0.000	0.138
		B	0.000	0.000	0.000	0.000	0.138
		C	0.000	0.000	0.000	1.980	0.318
L28	32.000-28.250	A	0.000	0.000	0.000	0.000	0.169
		B	0.000	0.000	0.000	0.000	0.104
		C	0.000	0.000	0.000	1.485	0.391
L29	28.250-28.080	A	0.000	0.000	0.000	0.000	0.010
		B	0.000	0.000	0.000	0.000	0.005
		C	0.000	0.000	0.000	0.067	0.021
L30	28.080-27.250	A	0.000	0.000	0.000	0.000	0.047
		B	0.000	0.000	0.000	0.000	0.023
		C	0.000	0.000	0.000	0.329	0.101
L31	27.250-22.250	A	0.000	0.000	0.000	0.000	0.220
		B	0.000	0.000	0.000	0.000	0.076
		C	0.000	0.000	0.000	1.980	0.544
L32	22.250-17.250	A	0.000	0.000	0.000	0.000	0.159
		B	0.000	0.000	0.000	0.000	0.015
		C	0.000	0.000	0.000	1.980	0.484
L33	17.250-16.000	A	0.000	0.000	0.000	0.000	0.062
		B	0.000	0.000	0.000	0.000	0.026
		C	0.000	0.000	0.000	0.495	0.143
L34	16.000-14.580	A	0.000	0.000	0.000	0.000	0.096
		B	0.000	0.000	0.000	0.000	0.056
		C	0.000	0.000	0.000	0.562	0.162
L35	14.580-12.250	A	0.000	0.000	0.000	0.000	0.182
		B	0.000	0.000	0.000	0.000	0.115
		C	0.000	0.000	0.000	0.923	0.266
L36	12.250-10.000	A	0.000	0.000	0.000	0.000	0.176
		B	0.000	0.000	0.000	0.000	0.111
		C	0.000	0.000	0.000	0.891	0.219
L37	10.000-5.000	A	0.000	0.000	0.000	0.000	0.329
		B	0.000	0.000	0.000	0.000	0.185
		C	0.000	0.000	0.000	1.980	0.365
L38	5.000-0.000	A	0.000	0.000	0.000	0.000	0.259
		B	0.000	0.000	0.000	0.000	0.130
		C	0.000	0.000	0.000	1.980	0.310

Feed Line/Linear Appurtenances Section Areas - With Ice

tnxTower	Job	Page
	West Johnson Ave BU876313	11 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	**Project** 1466OA1400	**Date** 15:14:35 06/04/14
	Client Crown Castle	**Designed by** Jeff Theberge

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	160.000-155.000	A	1.206	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.012
L2	155.000-150.000	A	1.202	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.031
L3	150.000-148.000	A	1.198	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.012
L4	148.000-143.000	A	1.195	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.047
L5	143.000-138.000	A	1.190	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.047
L6	138.000-133.000	A	1.185	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	2.175	0.109
L7	133.000-128.000	A	1.179	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	2.169	0.109
L8	128.000-123.000	A	1.174	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	3.895	0.262
L9	123.000-118.000	A	1.168	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	4.316	0.333
L10	118.000-111.000	A	1.161	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	6.023	0.655
L11	111.000-109.750	A	1.156	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	1.075	0.117
L12	109.750-105.250	A	1.152	0.000	0.000	0.000	0.000	0.021
		B		0.000	0.000	0.000	0.000	0.021
		C		0.000	0.000	0.000	3.856	0.439
L13	105.250-100.250	A	1.146	0.000	0.000	0.000	0.000	0.070
		B		0.000	0.000	0.000	0.000	0.070
		C		0.000	0.000	0.000	4.272	0.532
L14	100.250-95.250	A	1.139	0.000	0.000	0.000	0.000	0.070
		B		0.000	0.000	0.000	0.000	0.070
		C		0.000	0.000	0.000	4.258	0.530
L15	95.250-90.250	A	1.132	0.000	0.000	0.000	0.000	0.070
		B		0.000	0.000	0.000	0.000	0.070
		C		0.000	0.000	0.000	4.244	0.527
L16	90.250-85.250	A	1.125	0.000	0.000	0.000	0.000	0.070
		B		0.000	0.000	0.000	0.000	0.070
		C		0.000	0.000	0.000	4.229	0.524
L17	85.250-76.750	A	1.114	0.000	0.000	0.000	0.000	0.119
		B		0.000	0.000	0.000	0.000	0.119
		C		0.000	0.000	0.000	7.153	0.884
L18	76.750-75.750	A	1.106	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.841	0.090
L19	75.750-70.750	A	1.100	0.000	0.000	0.000	0.000	0.043
		B		0.000	0.000	0.000	0.000	0.043
		C		0.000	0.000	0.000	4.181	0.488
L20	70.750-65.750	A	1.091	0.000	0.000	0.000	0.000	0.096
		B		0.000	0.000	0.000	0.000	0.096
		C		0.000	0.000	0.000	4.162	0.537
L21	65.750-60.750	A	1.081	0.000	0.000	0.000	0.000	0.096

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
		B		0.000	0.000	0.000	0.000	0.096
		C		0.000	0.000	0.000	4.142	0.533
L22	60.750-55.750	A	1.071	0.000	0.000	0.000	0.000	0.096
		B		0.000	0.000	0.000	0.000	0.096
		C		0.000	0.000	0.000	4.121	0.529
L23	55.750-50.750	A	1.059	0.000	0.000	0.000	0.000	0.096
		B		0.000	0.000	0.000	0.000	0.096
		C		0.000	0.000	0.000	4.098	0.525
L24	50.750-43.000	A	1.043	0.000	0.000	0.000	0.000	0.329
		B		0.000	0.000	0.000	0.000	0.329
		C		0.000	0.000	0.000	6.302	0.984
L25	43.000-42.000	A	1.031	0.000	0.000	0.000	0.000	0.028
		B		0.000	0.000	0.000	0.000	0.028
		C		0.000	0.000	0.000	0.813	0.112
L26	42.000-37.000	A	1.022	0.000	0.000	0.000	0.000	0.138
		B		0.000	0.000	0.000	0.000	0.138
		C		0.000	0.000	0.000	4.024	0.553
L27	37.000-32.000	A	1.005	0.000	0.000	0.000	0.000	0.138
		B		0.000	0.000	0.000	0.000	0.138
		C		0.000	0.000	0.000	3.991	0.547
L28	32.000-28.250	A	1.000	0.000	0.000	0.000	0.000	0.169
		B		0.000	0.000	0.000	0.000	0.104
		C		0.000	0.000	0.000	2.985	0.561
L29	28.250-28.080	A	1.000	0.000	0.000	0.000	0.000	0.010
		B		0.000	0.000	0.000	0.000	0.005
		C		0.000	0.000	0.000	0.135	0.028
L30	28.080-27.250	A	1.000	0.000	0.000	0.000	0.000	0.047
		B		0.000	0.000	0.000	0.000	0.023
		C		0.000	0.000	0.000	0.661	0.138
L31	27.250-22.250	A	1.000	0.000	0.000	0.000	0.000	0.220
		B		0.000	0.000	0.000	0.000	0.076
		C		0.000	0.000	0.000	3.980	0.771
L32	22.250-17.250	A	1.000	0.000	0.000	0.000	0.000	0.159
		B		0.000	0.000	0.000	0.000	0.015
		C		0.000	0.000	0.000	3.980	0.710
L33	17.250-16.000	A	1.000	0.000	0.000	0.000	0.000	0.062
		B		0.000	0.000	0.000	0.000	0.026
		C		0.000	0.000	0.000	0.995	0.199
L34	16.000-14.580	A	1.000	0.000	0.000	0.000	0.000	0.096
		B		0.000	0.000	0.000	0.000	0.056
		C		0.000	0.000	0.000	1.130	0.226
L35	14.580-12.250	A	1.000	0.000	0.000	0.000	0.000	0.182
		B		0.000	0.000	0.000	0.000	0.115
		C		0.000	0.000	0.000	1.855	0.371
L36	12.250-10.000	A	1.000	0.000	0.000	0.000	0.000	0.176
		B		0.000	0.000	0.000	0.000	0.111
		C		0.000	0.000	0.000	1.791	0.321
L37	10.000-5.000	A	1.000	0.000	0.000	0.000	0.000	0.329
		B		0.000	0.000	0.000	0.000	0.185
		C		0.000	0.000	0.000	3.980	0.591
L38	5.000-0.000	A	1.000	0.000	0.000	0.000	0.000	0.259
		B		0.000	0.000	0.000	0.000	0.130
		C		0.000	0.000	0.000	3.980	0.536

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	160.000-155.000	0.0000	0.0000	0.0000	0.0000
L2	155.000-150.000	0.0000	0.0000	0.0000	0.0000
L3	150.000-148.000	0.0000	0.0000	0.0000	0.0000
L4	148.000-143.000	0.0000	0.0000	0.0000	0.0000
L5	143.000-138.000	0.0000	0.0000	0.0000	0.0000
L6	138.000-133.000	-0.2349	0.1356	-0.4335	0.2503
L7	133.000-128.000	-0.2355	0.1360	-0.4360	0.2517
L8	128.000-123.000	-0.3995	0.2306	-0.7042	0.4066
L9	123.000-118.000	-0.4385	0.2532	-0.7668	0.4427
L10	118.000-111.000	-0.4407	0.2545	-0.7735	0.4466
L11	111.000-109.750	-0.4411	0.2547	-0.7750	0.4474
L12	109.750-105.250	-0.4421	0.2553	-0.7767	0.4484
L13	105.250-100.250	-0.4437	0.2562	-0.7813	0.4511
L14	100.250-95.250	-0.4453	0.2571	-0.7858	0.4537
L15	95.250-90.250	-0.4469	0.2580	-0.7899	0.4561
L16	90.250-85.250	-0.4484	0.2589	-0.7937	0.4582
L17	85.250-76.750	-0.4503	0.2600	-0.7982	0.4608
L18	76.750-75.750	-0.4505	0.2601	-0.7991	0.4614
L19	75.750-70.750	-0.4513	0.2606	-0.7987	0.4611
L20	70.750-65.750	-0.4526	0.2613	-0.8011	0.4625
L21	65.750-60.750	-0.4538	0.2620	-0.8032	0.4637
L22	60.750-55.750	-0.4550	0.2627	-0.8048	0.4646
L23	55.750-50.750	-0.4562	0.2634	-0.8059	0.4653
L24	50.750-43.000	-0.4576	0.2642	-0.8066	0.4657
L25	43.000-42.000	-0.4575	0.2642	-0.8064	0.4656
L26	42.000-37.000	-0.4582	0.2645	-0.8027	0.4634
L27	37.000-32.000	-0.4592	0.2651	-0.8017	0.4629
L28	32.000-28.250	-0.4601	0.2656	-0.8033	0.4638
L29	28.250-28.080	-0.4604	0.2658	-0.8047	0.4646
L30	28.080-27.250	-0.4605	0.2659	-0.8051	0.4648
L31	27.250-22.250	-0.4611	0.2662	-0.8071	0.4660
L32	22.250-17.250	-0.4620	0.2667	-0.8106	0.4680
L33	17.250-16.000	-0.4626	0.2671	-0.8127	0.4692
L34	16.000-14.580	-0.4628	0.2672	-0.8135	0.4697
L35	14.580-12.250	-0.4631	0.2674	-0.8148	0.4704
L36	12.250-10.000	-0.4635	0.2676	-0.8163	0.4713
L37	10.000-5.000	-0.4642	0.2680	-0.8186	0.4726
L38	5.000-0.000	-0.4650	0.2685	-0.8217	0.4744

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 101-3]	C	None			0.0000	157.000	No Ice	7.500	7.500	0.252
							1/2" Ice	8.900	8.900	0.333
							1" Ice	10.300	10.300	0.414
							2" Ice	13.100	13.100	0.576
							4" Ice	18.700	18.700	0.900
800 10121 w/ Mount Pipe	A	From Face	4.000		10.0000	157.000	No Ice	5.685	4.600	0.066
			0.000				1/2" Ice	6.182	5.351	0.114
			1.000				1" Ice	6.676	6.046	0.168

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	7.695	7.526	0.298
						4" Ice	9.858	10.832	0.675
800 10121 w/ Mount Pipe	B	From Face	4.000 0.000 1.000	20.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.066 0.114 0.168 0.298 0.675
800 10121 w/ Mount Pipe	C	From Face	4.000 0.000 1.000	20.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.066 0.114 0.168 0.298 0.675
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.000 0.000 1.000	10.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
DC6-48-60-18-8F	B	From Face	4.000 0.000 1.000	-20.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.798 3.038 3.543 4.658	4.317 4.596 4.885 5.488 6.797	0.033 0.064 0.099 0.181 0.397
P65-17-XLH-RR w/ Mount Pipe	B	From Face	4.000 0.000 1.000	20.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.704 12.424 13.153 14.639 17.906	8.938 10.450 11.986 14.313 19.144	0.092 0.178 0.273 0.498 1.126
SBNH-1D6565C w/ Mount Pipe	C	From Face	4.000 0.000 1.000	20.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.683 12.404 13.135 14.601 17.875	9.842 11.366 12.914 15.267 20.139	0.099 0.189 0.288 0.522 1.167
(2) LGP21401	A	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401	B	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401	C	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
RRUS-11	A	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302
RRUS-11	B	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS-11	C	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302
RRUS-11	A	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302
RRUS-11	B	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302
RRUS-11	C	From Face	4.000 0.000 1.000	0.0000	157.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.055 0.074 0.097 0.151 0.302
**									
Platform Mount [LP 712-1]	C	None		0.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	-15.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.000 0.000 0.000	35.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	-5.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
IBC1900BB-1	A	From Face	4.000 0.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900BB-1	B	From Face	4.000 0.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900BB-1	C	From Face	4.000 0.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.127 1.273 1.427 1.761 2.534	0.533 0.647 0.770 1.041 1.688	0.022 0.030 0.039 0.065 0.147
IBC1900HG-2A	A	From Face	4.000	0.0000	148.000	No Ice	1.127	0.533	0.022

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	1.273	0.647	0.030
			0.000			1" Ice	1.427	0.770	0.039
						2" Ice	1.761	1.041	0.065
						4" Ice	2.534	1.688	0.147
IBC1900HG-2A	B	From Face	4.000	0.0000	148.000	No Ice	1.127	0.533	0.022
			0.000			1/2" Ice	1.273	0.647	0.030
			0.000			1" Ice	1.427	0.770	0.039
						2" Ice	1.761	1.041	0.065
						4" Ice	2.534	1.688	0.147
IBC1900HG-2A	C	From Face	4.000	0.0000	148.000	No Ice	1.127	0.533	0.022
			0.000			1/2" Ice	1.273	0.647	0.030
			0.000			1" Ice	1.427	0.770	0.039
						2" Ice	1.761	1.041	0.065
						4" Ice	2.534	1.688	0.147
(2) Empty Pipe Mount	A	From Face	4.000	0.0000	148.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
(2) Empty Pipe Mount	B	From Face	4.000	0.0000	148.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
(2) Empty Pipe Mount	C	From Face	4.000	0.0000	148.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
**									
Side Arm Mount [SO 103-3]	C	None		0.0000	146.000	No Ice	9.500	9.500	0.224
						1/2" Ice	11.800	11.800	0.317
						1" Ice	14.100	14.100	0.410
						2" Ice	18.700	18.700	0.596
						4" Ice	27.900	27.900	0.968
(2) PCS 1900MHz 4x45W-65MHz	A	From Face	4.000	-15.0000	146.000	No Ice	2.709	2.611	0.060
			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
(2) PCS 1900MHz 4x45W-65MHz	B	From Face	4.000	35.0000	146.000	No Ice	2.709	2.611	0.060
			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
(2) PCS 1900MHz 4x45W-65MHz	C	From Face	4.000	-5.0000	146.000	No Ice	2.709	2.611	0.060
			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
800MHz 2X50W RRH W/FILTER	A	From Face	4.000	-15.0000	146.000	No Ice	2.401	2.254	0.064
			0.000			1/2" Ice	2.613	2.460	0.086
			0.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	B	From Face	4.000	35.0000	146.000	No Ice	2.401	2.254	0.064
			0.000			1/2" Ice	2.613	2.460	0.086

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
			0.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	C	From Face	4.000 0.000 0.000	-5.0000	146.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
**									
Side Arm Mount [SO 102-3]	C	None		0.0000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.480 3.960 4.920 6.840	3.000 3.480 3.960 4.920 6.840	0.081 0.111 0.141 0.201 0.321
RRH2X40-AWS	A	From Face	4.000 0.000 1.000	0.0000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS	B	From Face	4.000 0.000 1.000	0.0000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS	C	From Face	4.000 0.000 1.000	0.0000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
**									
Platform Mount [LP 712-1]	C	None		0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.745 11.412 12.045 13.341 16.054	10.700 11.967 12.948 14.963 19.208	0.052 0.145 0.247 0.480 1.095
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.745 11.412 12.045 13.341 16.054	10.700 11.967 12.948 14.963 19.208	0.052 0.145 0.247 0.480 1.095
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.745 11.412 12.045 13.341 16.054	10.700 11.967 12.948 14.963 19.208	0.052 0.145 0.247 0.480 1.095
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.801 6.953 7.819 9.601 13.366	0.042 0.103 0.171 0.335 0.804
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	B	From Face	4.000 0.000	0.0000	138.000	No Ice 1/2" Ice	7.969 8.609	5.801 6.953	0.042 0.103

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
			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.801 6.953 7.819 9.601 13.366	0.042 0.103 0.171 0.335 0.804
BXA-171063-12BF-EDIN-X w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.037 5.592 6.113 7.177 9.449	5.297 6.470 7.360 9.162 12.966	0.039 0.085 0.138 0.271 0.675
BXA-171063-12BF-EDIN-X w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.037 5.592 6.113 7.177 9.449	5.297 6.470 7.360 9.162 12.966	0.039 0.085 0.138 0.271 0.675
BXA-171063-12BF-EDIN-X w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.037 5.592 6.113 7.177 9.449	5.297 6.470 7.360 9.162 12.966	0.039 0.085 0.138 0.271 0.675
KS24019-L112A	C	From Face	4.000 0.000 4.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.156 0.225 0.302 0.484 0.951	0.156 0.225 0.302 0.484 0.951	0.005 0.007 0.009 0.018 0.056
(2) FD9R6004/2C-3L	A	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L	B	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
742 213 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
742 213 w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
742 213 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.373 5.950 6.501 7.611	4.620 6.000 6.982 8.852	0.049 0.094 0.146 0.277

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	9.933	12.794	0.683
DB-T1-6Z-8AB-0Z	C	From Face	4.000 0.000 0.000	0.0000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455
**									
Platform Mount [LP 712-1]	C	None		0.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
(2) RR65-19-02DPL5 w/ Mount Pipe	A	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.104 6.666 7.194 8.273 10.822	4.412 5.624 6.496 8.273 12.027	0.042 0.089 0.143 0.278 0.685
(2) RR65-19-02DPL5 w/ Mount Pipe	B	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.104 6.666 7.194 8.273 10.822	4.412 5.624 6.496 8.273 12.027	0.042 0.089 0.143 0.278 0.685
(2) RR65-19-02DPL5 w/ Mount Pipe	C	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.104 6.666 7.194 8.273 10.822	4.412 5.624 6.496 8.273 12.027	0.042 0.089 0.143 0.278 0.685
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	A	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.936 7.439 7.942 8.978 11.175	3.289 3.995 4.661 6.044 9.023	0.059 0.105 0.157 0.283 0.650
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	B	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.936 7.439 7.942 8.978 11.175	3.289 3.995 4.661 6.044 9.023	0.059 0.105 0.157 0.283 0.650
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	C	From Face	4.000 0.000 1.000	60.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.936 7.439 7.942 8.978 11.175	3.289 3.995 4.661 6.044 9.023	0.059 0.105 0.157 0.283 0.650
(2) S20057A-1	A	From Face	4.000 0.000 1.000	0.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.394 0.505 0.624 0.889 1.522	0.005 0.010 0.018 0.038 0.106
(2) S20057A-1	B	From Face	4.000 0.000 1.000	0.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.394 0.505 0.624 0.889 1.522	0.005 0.010 0.018 0.038 0.106
(2) S20057A-1	C	From Face	4.000 0.000 1.000	0.0000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.394 0.505 0.624 0.889 1.522	0.005 0.010 0.018 0.038 0.106

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
ONEBASE TWIN DUAL DUPLEX TMA	A	From Face	4.000	0.0000	127.000	No Ice	0.000	0.306	0.011
			0.000			1/2" Ice	0.000	0.392	0.016
			1.000			1" Ice	0.000	0.486	0.022
						2" Ice	0.000	0.699	0.040
						4" Ice	0.000	1.231	0.103
ONEBASE TWIN DUAL DUPLEX TMA	B	From Face	4.000	0.0000	127.000	No Ice	0.000	0.306	0.011
			0.000			1/2" Ice	0.000	0.392	0.016
			1.000			1" Ice	0.000	0.486	0.022
						2" Ice	0.000	0.699	0.040
						4" Ice	0.000	1.231	0.103
ONEBASE TWIN DUAL DUPLEX TMA	C	From Face	4.000	0.0000	127.000	No Ice	0.000	0.306	0.011
			0.000			1/2" Ice	0.000	0.392	0.016
			1.000			1" Ice	0.000	0.486	0.022
						2" Ice	0.000	0.699	0.040
						4" Ice	0.000	1.231	0.103
**									
T-Arm Mount [TA 602-3]	C	None		0.0000	119.000	No Ice	11.590	11.590	0.774
						1/2" Ice	15.440	15.440	0.990
						1" Ice	19.290	19.290	1.206
						2" Ice	26.990	26.990	1.639
						4" Ice	42.390	42.390	2.503
Empty Pipe Mount	A	From Face	4.000	0.0000	119.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
Empty Pipe Mount	A	From Face	4.000	0.0000	119.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
Empty Pipe Mount	A	From Face	4.000	0.0000	119.000	No Ice	0.723	0.723	0.150
			0.000			1/2" Ice	0.940	0.940	0.156
			0.000			1" Ice	1.165	1.165	0.166
						2" Ice	1.644	1.644	0.192
						4" Ice	2.889	2.889	0.281
HBX-6516DS-VTM w/ Mount Pipe	A	From Face	4.000	30.0000	119.000	No Ice	3.598	3.241	0.029
			0.000			1/2" Ice	3.998	3.914	0.062
			0.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
HBX-6516DS-VTM w/ Mount Pipe	B	From Face	4.000	20.0000	119.000	No Ice	3.598	3.241	0.029
			0.000			1/2" Ice	3.998	3.914	0.062
			0.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
HBX-6516DS-VTM w/ Mount Pipe	C	From Face	4.000	30.0000	119.000	No Ice	3.598	3.241	0.029
			0.000			1/2" Ice	3.998	3.914	0.062
			0.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
**									

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	160 - 155	Pole	Max Tension	11	0.000	0.000	-0.000
			Max. Compression	14	-3.170	-0.718	0.022
			Max. Mx	5	-0.929	-9.923	-0.132
			Max. My	2	-0.943	0.052	9.437
			Max. Vy	11	-3.412	9.534	0.099
			Max. Vx	8	3.314	-0.177	-9.435
			Max. Torque	8			1.149
L2	155 - 150	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-3.450	-0.715	0.019
			Max. Mx	5	-1.125	-27.292	-0.324
			Max. My	2	-1.138	0.241	26.320

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	-3.536	26.904	0.293
			Max. Vx	8	3.439	-0.376	-26.318
			Max. Torque	8			1.149
L3	150 - 148	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-3.562	-0.713	0.018
			Max. Mx	5	-1.207	-34.411	-0.401
			Max. My	2	-1.220	0.319	33.243
			Max. Vy	11	-3.584	34.023	0.371
			Max. Vx	8	3.487	-0.453	-33.243
			Max. Torque	8			1.148
L4	148 - 143	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-9.804	-0.698	0.012
			Max. Mx	5	-4.467	-71.158	-0.794
			Max. My	8	-4.490	-0.815	-69.180
			Max. Vy	11	-8.089	70.778	0.700
			Max. Vx	8	7.920	-0.815	-69.180
			Max. Torque	7			1.234
L5	143 - 138	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-10.787	-0.681	0.004
			Max. Mx	5	-4.985	-113.016	-1.167
			Max. My	8	-5.007	-1.189	-110.202
			Max. Vy	11	-8.801	112.644	1.074
			Max. Vx	8	8.632	-1.189	-110.202
			Max. Torque	7			1.234
L6	138 - 133	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-17.060	-0.623	-0.769
			Max. Mx	5	-6.812	-188.874	-1.732
			Max. My	8	-6.820	-1.562	-186.155
			Max. Vy	11	-15.348	188.524	1.266
			Max. Vx	8	15.313	-1.562	-186.155
			Max. Torque	7			1.233
L7	133 - 128	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-17.711	-0.563	-0.796
			Max. Mx	5	-7.255	-266.454	-2.111
			Max. My	8	-7.263	-1.934	-263.584
			Max. Vy	11	-15.698	266.128	1.644
			Max. Vx	8	15.663	-1.934	-263.584
			Max. Torque	8			1.152
L8	128 - 123	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-22.336	-0.388	-0.886
			Max. Mx	5	-9.288	-360.441	-2.502
			Max. My	8	-9.295	-2.290	-357.447
			Max. Vy	11	-19.235	360.175	2.018
			Max. Vx	8	19.199	-2.290	-357.447
			Max. Torque	8			1.145
L9	123 - 118	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-25.384	2.131	0.300
			Max. Mx	11	-11.076	460.397	3.518
			Max. My	2	-11.088	4.604	456.050
			Max. Vy	11	-20.701	460.397	3.518
			Max. Vx	2	-20.666	4.604	456.050
			Max. Torque	8			1.132
L10	118 - 111	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-26.070	2.386	0.162
			Max. Mx	11	-11.485	528.070	3.744
			Max. My	2	-11.498	4.882	523.560
			Max. Vy	11	-20.940	528.070	3.744
			Max. Vx	8	20.905	-0.881	-521.860
			Max. Torque	7			0.567
L11	111 - 109.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-27.669	2.778	-0.051

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-12.457	633.886	4.093
			Max. My	2	-12.468	5.309	629.123
			Max. Vy	11	-21.370	633.886	4.093
			Max. Vx	8	21.335	-1.199	-627.484
			Max. Torque	7			0.544
L12	109.75 - 105.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-28.781	3.135	-0.245
			Max. Mx	11	-13.195	730.810	4.406
			Max. My	2	-13.206	5.694	725.819
			Max. Vy	11	-21.706	730.810	4.406
			Max. Vx	8	21.672	-1.483	-724.235
			Max. Torque	7			0.540
L13	105.25 - 100.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-30.379	3.537	-0.465
			Max. Mx	11	-14.351	840.391	4.753
			Max. My	2	-14.361	6.124	835.145
			Max. Vy	11	-22.123	840.391	4.753
			Max. Vx	8	22.089	-1.799	-833.625
			Max. Torque	7			0.525
L14	100.25 - 95.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.992	3.945	-0.690
			Max. Mx	11	-15.523	952.045	5.098
			Max. My	2	-15.533	6.556	946.543
			Max. Vy	11	-22.534	952.045	5.098
			Max. Vx	8	22.500	-2.113	-945.088
			Max. Torque	7			0.509
L15	95.25 - 90.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33.621	4.359	-0.918
			Max. Mx	11	-16.719	1065.725	5.443
			Max. My	2	-16.728	6.989	1059.963
			Max. Vy	11	-22.935	1065.725	5.443
			Max. Vx	8	22.900	-2.425	-1058.577
			Max. Torque	7			0.492
L16	90.25 - 85.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-35.264	4.778	-1.150
			Max. Mx	11	-17.937	1181.377	5.786
			Max. My	2	-17.945	7.423	1175.354
			Max. Vy	11	-23.324	1181.377	5.786
			Max. Vx	8	23.290	-2.735	-1174.038
			Max. Torque	7			0.475
L17	85.25 - 76.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-36.673	5.139	-1.350
			Max. Mx	11	-18.988	1281.182	6.076
			Max. My	2	-18.996	7.793	1274.934
			Max. Vy	11	-23.643	1281.182	6.076
			Max. Vx	8	23.609	-2.997	-1273.682
			Max. Torque	7			0.458
L18	76.75 - 75.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-39.131	5.586	-1.599
			Max. Mx	11	-20.768	1406.550	6.434
			Max. My	2	-20.775	8.250	1400.026
			Max. Vy	11	-24.097	1406.550	6.434
			Max. Vx	8	24.062	-3.321	-1398.851
			Max. Torque	7			0.428
L19	75.75 - 70.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-40.624	6.010	-1.835
			Max. Mx	11	-21.888	1527.789	6.774
			Max. My	2	-21.894	8.687	1520.999
			Max. Vy	11	-24.407	1527.789	6.774

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	24.373	-3.628	-1519.900
			Max. Torque	7			0.425
L20	70.75 - 65.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-42.577	6.436	-2.074
			Max. Mx	11	-23.429	1650.707	7.112
			Max. My	2	-23.435	9.122	1643.652
			Max. Vy	11	-24.766	1650.707	7.112
			Max. Vx	8	24.732	-3.932	-1642.630
			Max. Torque	7			0.408
L21	65.75 - 60.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-44.546	6.864	-2.315
			Max. Mx	11	-24.988	1775.402	7.447
			Max. My	2	-24.993	9.559	1768.080
			Max. Vy	11	-25.114	1775.402	7.447
			Max. Vx	8	25.081	-4.235	-1767.138
			Max. Torque	7			0.391
L22	60.75 - 55.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.530	7.294	-2.556
			Max. Mx	11	-26.567	1901.796	7.781
			Max. My	2	-26.572	9.995	1894.206
			Max. Vy	11	-25.446	1901.796	7.781
			Max. Vx	8	25.413	-4.535	-1893.346
			Max. Torque	7			0.374
L23	55.75 - 50.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-48.528	7.723	-2.799
			Max. Mx	11	-28.168	2029.806	8.112
			Max. My	2	-28.173	10.431	2021.947
			Max. Vy	11	-25.761	2029.806	8.112
			Max. Vx	8	25.729	-4.833	-2021.171
			Max. Torque	7			0.357
L24	50.75 - 43	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-49.825	7.959	-2.933
			Max. Mx	11	-29.245	2100.876	8.293
			Max. My	2	-29.249	10.671	2092.868
			Max. Vy	11	-25.934	2100.876	8.293
			Max. Vx	8	25.902	-4.996	-2092.139
			Max. Torque	7			0.340
L25	43 - 42	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-54.218	8.475	-3.225
			Max. Mx	11	-32.859	2257.939	8.689
			Max. My	2	-32.863	11.194	2249.607
			Max. Vy	11	-26.407	2257.939	8.689
			Max. Vx	8	26.375	-5.351	-2248.980
			Max. Torque	7			0.314
L26	42 - 37	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-56.612	8.896	-3.463
			Max. Mx	11	-34.862	2390.678	9.016
			Max. My	2	-34.865	11.630	2382.074
			Max. Vy	11	-26.692	2390.678	9.016
			Max. Vx	8	26.660	-5.645	-2381.535
			Max. Torque	7			0.311
L27	37 - 32	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-59.021	9.292	-3.692
			Max. Mx	11	-36.886	2524.783	9.342
			Max. My	2	-36.889	12.066	2515.908
			Max. Vy	11	-26.955	2524.783	9.342
			Max. Vx	8	26.923	-5.937	-2515.458
			Max. Torque	7			0.295
L28	32 - 28.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-61.058	9.588	-3.863
			Max. Mx	11	-38.635	2626.213	9.584

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-38.637	12.392	2617.133
			Max. Vy	11	-27.150	2626.213	9.584
			Max. Vx	8	27.119	-6.154	-2616.751
			Max. Torque	8			0.280
L29	28.25 - 28.08	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-61.166	9.610	-3.874
			Max. Mx	11	-38.740	2630.833	9.596
			Max. My	2	-38.743	12.407	2621.744
			Max. Vy	11	-27.210	2630.833	9.596
			Max. Vx	2	-27.177	12.407	2621.744
			Max. Torque	8			0.270
L30	28.08 - 27.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-61.715	9.669	-3.909
			Max. Mx	11	-39.216	2653.387	9.648
			Max. My	2	-39.218	12.479	2644.252
			Max. Vy	11	-27.202	2653.387	9.648
			Max. Vx	8	27.170	-6.212	-2643.888
			Max. Torque	8			0.269
L31	27.25 - 22.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-64.430	10.072	-4.143
			Max. Mx	11	-41.539	2790.022	9.968
			Max. My	2	-41.541	12.912	2780.615
			Max. Vy	11	-27.453	2790.022	9.968
			Max. Vx	8	27.422	-6.498	-2780.343
			Max. Torque	8			0.267
L32	22.25 - 17.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-66.987	10.483	-4.381
			Max. Mx	11	-43.706	2927.855	10.285
			Max. My	2	-43.708	13.345	2918.175
			Max. Vy	11	-27.686	2927.855	10.285
			Max. Vx	8	27.656	-6.782	-2917.997
			Max. Torque	8			0.253
L33	17.25 - 16	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-67.696	10.587	-4.441
			Max. Mx	11	-44.314	2962.493	10.364
			Max. My	2	-44.316	13.452	2952.746
			Max. Vy	11	-27.748	2962.493	10.364
			Max. Vx	8	27.718	-6.852	-2952.591
			Max. Torque	8			0.239
L34	16 - 14.58	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-68.643	10.706	-4.510
			Max. Mx	11	-45.145	3001.938	10.453
			Max. My	2	-45.146	13.575	2992.113
			Max. Vy	11	-27.821	3001.938	10.453
			Max. Vx	8	27.792	-6.932	-2991.985
			Max. Torque	8			0.235
L35	14.58 - 12.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-70.181	10.903	-4.624
			Max. Mx	11	-46.496	3066.879	10.599
			Max. My	2	-46.497	13.775	3056.927
			Max. Vy	11	-27.933	3066.879	10.599
			Max. Vx	8	27.903	-7.063	-3056.844
			Max. Torque	8			0.231
L36	12.25 - 10	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-71.763	11.095	-4.734
			Max. Mx	11	-47.891	3129.847	10.740
			Max. My	2	-47.892	13.968	3119.772
			Max. Vy	11	-28.046	3129.847	10.740
			Max. Vx	8	28.017	-7.188	-3119.733
			Max. Torque	8			0.224
L37	10 - 5	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-74.743	11.526	-4.984
			Max. Mx	11	-50.462	3270.642	11.049
			Max. My	8	-50.463	-7.464	-3260.353
			Max. Vy	11	-28.276	3270.642	11.049
			Max. Vx	8	28.247	-7.464	-3260.353
			Max. Torque	8			0.218
L38	5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-77.567	11.965	-5.238
			Max. Mx	11	-52.873	3412.557	11.354
			Max. My	8	-52.873	-7.737	-3402.095
			Max. Vy	11	-28.494	3412.557	11.354
			Max. Vx	8	28.466	-7.737	-3402.095
			Max. Torque	8			0.203

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	77.567	-0.000	0.000
	Max. H_x	11	52.883	28.477	0.070
	Max. H_z	2	52.883	0.070	28.446
	Max. M_x	2	3401.937	0.070	28.446
	Max. M_z	5	3405.526	-28.477	-0.070
	Max. Torsion	8	0.188	-0.070	-28.449
	Min. Vert	11	52.883	28.477	0.070
	Min. H_x	5	52.883	-28.477	-0.070
	Min. H_z	8	52.883	-0.070	-28.449
	Min. M_x	8	-3402.095	-0.070	-28.449
	Min. M_z	11	-3412.557	28.477	0.070
	Min. Torsion	2	-0.183	0.070	28.446

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	52.883	0.001	0.000	-0.029	3.298	0.000
Dead+Wind 0 deg - No Ice	52.883	-0.070	-28.446	-3401.937	14.823	0.183
Dead+Wind 30 deg - No Ice	52.883	14.181	-24.605	-2941.165	-1691.594	0.157
Dead+Wind 60 deg - No Ice	52.883	24.631	-14.165	-1691.594	-2943.793	0.086
Dead+Wind 90 deg - No Ice	52.883	28.477	0.070	11.205	-3405.526	-0.011
Dead+Wind 120 deg - No Ice	52.883	24.701	14.286	1710.939	-2954.994	-0.107
Dead+Wind 150 deg - No Ice	52.883	14.301	24.675	2952.219	-1711.090	-0.172
Dead+Wind 180 deg - No Ice	52.883	0.070	28.449	3402.095	-7.737	-0.188
Dead+Wind 210 deg - No Ice	52.883	-14.181	24.605	2940.996	1698.672	-0.151
Dead+Wind 240 deg - No Ice	52.883	-24.631	14.165	1691.422	2950.843	-0.075
Dead+Wind 270 deg - No Ice	52.883	-28.477	-0.070	-11.354	3412.557	0.016
Dead+Wind 300 deg - No Ice	52.883	-24.701	-14.286	-1711.063	2962.038	0.101
Dead+Wind 330 deg - No Ice	52.883	-14.301	-24.675	-2952.339	1718.162	0.162
Dead+Ice+Temp	77.567	0.000	-0.000	5.238	11.965	0.000
Dead+Wind 0 deg+Ice+Temp	77.567	-0.017	-8.276	-1040.737	15.085	-0.077
Dead+Wind 30 deg+Ice+Temp	77.567	4.119	-7.158	-899.116	-507.949	-0.014

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg+Ice+Temp	77.567	7.151	-4.123	-515.154	-891.632	0.052
Dead+Wind 90 deg+Ice+Temp	77.567	8.268	0.017	8.264	-1033.153	0.104
Dead+Wind 120 deg+Ice+Temp	77.567	7.169	4.153	530.886	-894.594	0.129
Dead+Wind 150 deg+Ice+Temp	77.567	4.149	7.176	912.674	-513.082	0.118
Dead+Wind 180 deg+Ice+Temp	77.567	0.017	8.276	1051.332	9.155	0.077
Dead+Wind 210 deg+Ice+Temp	77.567	-4.119	7.158	909.707	532.185	0.015
Dead+Wind 240 deg+Ice+Temp	77.567	-7.151	4.123	525.746	915.862	-0.050
Dead+Wind 270 deg+Ice+Temp	77.567	-8.268	-0.017	2.333	1057.382	-0.103
Dead+Wind 300 deg+Ice+Temp	77.567	-7.169	-4.153	-520.284	918.826	-0.128
Dead+Wind 330 deg+Ice+Temp	77.567	-4.149	-7.176	-902.074	537.321	-0.119
Dead+Wind 0 deg - Service	52.883	-0.027	-11.141	-1335.960	7.956	0.075
Dead+Wind 30 deg - Service	52.883	5.554	-9.636	-1154.951	-662.094	0.063
Dead+Wind 60 deg - Service	52.883	9.646	-5.548	-664.294	-1153.788	0.033
Dead+Wind 90 deg - Service	52.883	11.153	0.027	4.341	-1335.178	-0.006
Dead+Wind 120 deg - Service	52.883	9.674	5.595	671.791	-1158.201	-0.043
Dead+Wind 150 deg - Service	52.883	5.601	9.663	1159.214	-669.741	-0.069
Dead+Wind 180 deg - Service	52.883	0.027	11.141	1335.811	-0.876	-0.076
Dead+Wind 210 deg - Service	52.883	-5.554	9.636	1154.799	669.173	-0.062
Dead+Wind 240 deg - Service	52.883	-9.646	5.548	664.140	1160.864	-0.032
Dead+Wind 270 deg - Service	52.883	-11.153	-0.027	-4.491	1342.249	0.007
Dead+Wind 300 deg - Service	52.883	-9.674	-5.595	-671.937	1165.275	0.043
Dead+Wind 330 deg - Service	52.883	-5.601	-9.663	-1159.359	676.820	0.068

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-52.883	0.000	-0.001	52.883	-0.000	0.002%
2	-0.070	-52.883	-28.452	0.070	52.883	28.446	0.009%
3	14.181	-52.883	-24.605	-14.181	52.883	24.605	0.000%
4	24.631	-52.883	-14.165	-24.631	52.883	14.165	0.000%
5	28.482	-52.883	0.070	-28.477	52.883	-0.070	0.009%
6	24.701	-52.883	14.286	-24.701	52.883	-14.286	0.000%
7	14.301	-52.883	24.675	-14.301	52.883	-24.675	0.000%
8	0.070	-52.883	28.452	-0.070	52.883	-28.449	0.005%
9	-14.181	-52.883	24.605	14.181	52.883	-24.605	0.000%
10	-24.631	-52.883	14.165	24.631	52.883	-14.165	0.000%
11	-28.482	-52.883	-0.070	28.477	52.883	0.070	0.009%
12	-24.701	-52.883	-14.286	24.701	52.883	14.286	0.000%
13	-14.301	-52.883	-24.675	14.301	52.883	24.675	0.000%
14	0.000	-77.567	0.000	-0.000	77.567	0.000	0.000%
15	-0.017	-77.567	-8.276	0.017	77.567	8.276	0.000%
16	4.119	-77.567	-7.159	-4.119	77.567	7.158	0.000%
17	7.152	-77.567	-4.123	-7.151	77.567	4.123	0.000%
18	8.268	-77.567	0.017	-8.268	77.567	-0.017	0.000%
19	7.169	-77.567	4.153	-7.169	77.567	-4.153	0.000%
20	4.149	-77.567	7.176	-4.149	77.567	-7.176	0.000%
21	0.017	-77.567	8.276	-0.017	77.567	-8.276	0.000%
22	-4.119	-77.567	7.159	4.119	77.567	-7.158	0.000%
23	-7.152	-77.567	4.123	7.151	77.567	-4.123	0.000%
24	-8.268	-77.567	-0.017	8.268	77.567	0.017	0.000%
25	-7.169	-77.567	-4.153	7.169	77.567	4.153	0.000%
26	-4.149	-77.567	-7.176	4.149	77.567	7.176	0.000%
27	-0.027	-52.883	-11.143	0.027	52.883	11.141	0.004%
28	5.554	-52.883	-9.637	-5.554	52.883	9.636	0.001%
29	9.647	-52.883	-5.548	-9.646	52.883	5.548	0.001%
30	11.155	-52.883	0.027	-11.153	52.883	-0.027	0.004%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
31	9.674	-52.883	5.595	-9.674	52.883	-5.595	0.001%
32	5.601	-52.883	9.664	-5.601	52.883	-9.663	0.001%
33	0.027	-52.883	11.143	-0.027	52.883	-11.141	0.004%
34	-5.554	-52.883	9.637	5.554	52.883	-9.636	0.001%
35	-9.647	-52.883	5.548	9.646	52.883	-5.548	0.001%
36	-11.155	-52.883	-0.027	11.153	52.883	0.027	0.004%
37	-9.674	-52.883	-5.595	9.674	52.883	5.595	0.001%
38	-5.601	-52.883	-9.664	5.601	52.883	9.663	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000909
2	Yes	18	0.00008829	0.00013243
3	Yes	25	0.00000001	0.00009779
4	Yes	25	0.00000001	0.00009725
5	Yes	18	0.00008825	0.00013149
6	Yes	25	0.00000001	0.00009891
7	Yes	25	0.00000001	0.00009979
8	Yes	19	0.00005029	0.00009462
9	Yes	25	0.00000001	0.00009730
10	Yes	25	0.00000001	0.00009814
11	Yes	18	0.00008823	0.00014172
12	Yes	25	0.00000001	0.00010050
13	Yes	25	0.00000001	0.00009932
14	Yes	14	0.00000001	0.00011779
15	Yes	23	0.00000001	0.00013747
16	Yes	23	0.00000001	0.00014553
17	Yes	23	0.00000001	0.00014519
18	Yes	23	0.00000001	0.00013638
19	Yes	23	0.00000001	0.00014713
20	Yes	23	0.00000001	0.00014763
21	Yes	23	0.00000001	0.00013856
22	Yes	23	0.00000001	0.00014898
23	Yes	23	0.00000001	0.00014927
24	Yes	23	0.00000001	0.00013956
25	Yes	23	0.00000001	0.00014939
26	Yes	23	0.00000001	0.00014894
27	Yes	18	0.00009392	0.00006501
28	Yes	20	0.00000001	0.00013710
29	Yes	20	0.00000001	0.00013508
30	Yes	18	0.00009390	0.00006429
31	Yes	20	0.00000001	0.00013715
32	Yes	20	0.00000001	0.00014031
33	Yes	18	0.00009390	0.00006592
34	Yes	20	0.00000001	0.00013571
35	Yes	20	0.00000001	0.00013819
36	Yes	18	0.00009392	0.00006510
37	Yes	20	0.00000001	0.00014272
38	Yes	20	0.00000001	0.00013906

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 155	48.559	37	2.8052	0.0169
L2	155 - 150	45.626	37	2.7934	0.0141
L3	150 - 148	42.741	37	2.7049	0.0070
L4	148 - 143	41.621	37	2.6451	0.0041
L5	143 - 138	38.864	37	2.6219	0.0034
L6	138 - 133	36.138	37	2.5846	0.0028
L7	133 - 128	33.460	37	2.5292	0.0023
L8	128 - 123	30.851	37	2.4530	0.0018
L9	123 - 118	28.332	37	2.3577	0.0014
L10	118 - 111	25.922	37	2.2435	0.0010
L11	114.75 - 109.75	24.424	37	2.1595	0.0009
L12	109.75 - 105.25	22.198	37	2.0805	0.0008
L13	105.25 - 100.25	20.293	37	1.9639	0.0007
L14	100.25 - 95.25	18.286	37	1.8694	0.0006
L15	95.25 - 90.25	16.381	37	1.7691	0.0005
L16	90.25 - 85.25	14.583	37	1.6639	0.0004
L17	85.25 - 76.75	12.898	37	1.5542	0.0004
L18	81 - 75.75	11.558	37	1.4580	0.0003
L19	75.75 - 70.75	9.993	37	1.3752	0.0003
L20	70.75 - 65.75	8.629	37	1.2305	0.0002
L21	65.75 - 60.75	7.393	37	1.1295	0.0002
L22	60.75 - 55.75	6.264	37	1.0272	0.0002
L23	55.75 - 50.75	5.243	37	0.9238	0.0001
L24	50.75 - 43	4.330	37	0.8195	0.0001
L25	48 - 42	3.874	37	0.7623	0.0001
L26	42 - 37	2.953	37	0.6965	0.0001
L27	37 - 32	2.271	37	0.6072	0.0001
L28	32 - 28.25	1.682	37	0.5180	0.0001
L29	28.25 - 28.08	1.301	37	0.4510	0.0000
L30	28.08 - 27.25	1.285	37	0.4485	0.0000
L31	27.25 - 22.25	1.208	37	0.4376	0.0000
L32	22.25 - 17.25	0.796	37	0.3506	0.0000
L33	17.25 - 16	0.474	37	0.2632	0.0000
L34	16 - 14.58	0.408	37	0.2417	0.0000
L35	14.58 - 12.25	0.339	37	0.2216	0.0000
L36	12.25 - 10	0.240	37	0.1847	0.0000
L37	10 - 5	0.160	37	0.1536	0.0000
L38	5 - 0	0.040	37	0.0766	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.000	Side Arm Mount [SO 101-3]	37	46.797	2.8031	0.0156	5708
148.000	Platform Mount [LP 712-1]	37	41.621	2.6451	0.0041	3543
146.000	Side Arm Mount [SO 103-3]	37	40.513	2.6206	0.0031	5548
139.000	Side Arm Mount [SO 102-3]	37	36.680	2.5952	0.0030	6992
138.000	Platform Mount [LP 712-1]	37	36.138	2.5846	0.0028	6252
127.000	Platform Mount [LP 712-1]	37	30.340	2.4352	0.0017	3211
119.000	T-Arm Mount [TA 602-3]	37	26.394	2.2692	0.0011	2426

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 155	122.869	12	7.1085	0.0436
L2	155 - 150	115.464	12	7.0776	0.0364
L3	150 - 148	108.183	12	6.8514	0.0181
L4	148 - 143	105.355	12	6.6998	0.0108
L5	143 - 138	98.394	12	6.6412	0.0090
L6	138 - 133	91.513	12	6.5470	0.0075
L7	133 - 128	84.750	12	6.4068	0.0061
L8	128 - 123	78.161	12	6.2141	0.0048
L9	123 - 118	71.797	12	5.9728	0.0036
L10	118 - 111	65.708	12	5.6840	0.0028
L11	114.75 - 109.75	61.920	12	5.4728	0.0024
L12	109.75 - 105.25	56.292	12	5.2738	0.0021
L13	105.25 - 100.25	51.470	12	4.9796	0.0017
L14	100.25 - 95.25	46.389	12	4.7411	0.0015
L15	95.25 - 90.25	41.565	12	4.4878	0.0013
L16	90.25 - 85.25	37.012	12	4.2215	0.0011
L17	85.25 - 76.75	32.742	12	3.9442	0.0009
L18	81 - 75.75	29.344	12	3.7006	0.0008
L19	75.75 - 70.75	25.376	12	3.4908	0.0007
L20	70.75 - 65.75	21.915	12	3.1243	0.0006
L21	65.75 - 60.75	18.780	12	2.8684	0.0005
L22	60.75 - 55.75	15.914	12	2.6090	0.0004
L23	55.75 - 50.75	13.320	12	2.3467	0.0003
L24	50.75 - 43	11.002	12	2.0821	0.0003
L25	48 - 42	9.845	12	1.9368	0.0002
L26	42 - 37	7.506	12	1.7697	0.0002
L27	37 - 32	5.772	12	1.5430	0.0002
L28	32 - 28.25	4.275	12	1.3164	0.0001
L29	28.25 - 28.08	3.308	12	1.1464	0.0001
L30	28.08 - 27.25	3.267	12	1.1401	0.0001
L31	27.25 - 22.25	3.071	12	1.1122	0.0001
L32	22.25 - 17.25	2.023	12	0.8911	0.0001
L33	17.25 - 16	1.206	12	0.6691	0.0001
L34	16 - 14.58	1.038	12	0.6144	0.0001
L35	14.58 - 12.25	0.863	12	0.5635	0.0000
L36	12.25 - 10	0.611	12	0.4697	0.0000
L37	10 - 5	0.408	12	0.3906	0.0000
L38	5 - 0	0.102	12	0.1947	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.000	Side Arm Mount [SO 101-3]	12	118.420	7.1027	0.0403	2375
148.000	Platform Mount [LP 712-1]	12	105.355	6.6998	0.0108	1456
146.000	Side Arm Mount [SO 103-3]	12	102.558	6.6378	0.0081	2275
139.000	Side Arm Mount [SO 102-3]	12	92.881	6.5736	0.0080	2851
138.000	Platform Mount [LP 712-1]	12	91.513	6.5470	0.0075	2549
127.000	Platform Mount [LP 712-1]	12	76.869	6.1691	0.0045	1301
119.000	T-Arm Mount [TA 602-3]	12	66.900	5.7488	0.0029	981

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	160 - 159	TP10x10x0.322	5.000	0.000	0.0	21.000	9.7902	-0.033	205.594	0.000
	159 - 158					21.000	9.7902	-0.066	205.594	0.000
	158 - 157					21.000	9.7902	-0.099	205.594	0.000
	157 - 156					21.000	9.7902	-0.893	205.594	0.004
	156 - 155					21.000	9.7902	-0.927	205.594	0.005
L2	155 - 154	TP10x10x0.322	5.000	0.000	0.0	21.000	9.7902	-0.965	205.594	0.005
	154 - 153					21.000	9.7902	-1.003	205.594	0.005
	153 - 152					21.000	9.7902	-1.042	205.594	0.005
	152 - 151					21.000	9.7902	-1.082	205.594	0.005
	151 - 150					21.000	9.7902	-1.122	205.594	0.005
L3	150 - 149	TP10x10x0.322	2.000	0.000	0.0	21.000	9.7902	-1.163	205.594	0.006
	149 - 148					21.000	9.7902	-1.205	205.594	0.006
L4	148 - 147	TP23.81x23x0.25	5.000	0.000	0.0	36.000	18.1807	-3.584	654.504	0.005
	147 - 146					36.000	18.3092	-3.650	659.132	0.006
	146 - 145					36.000	18.4378	-4.327	663.760	0.007
	145 - 144					36.000	18.5663	-4.394	668.387	0.007
	144 - 143					36.000	18.6949	-4.462	673.015	0.007
L5	143 - 142	TP24.62x23.81x0.25	5.000	0.000	0.0	36.000	18.8234	-4.531	677.643	0.007
	142 - 141					36.000	18.9520	-4.600	682.270	0.007
	141 - 140					36.000	19.0805	-4.670	686.898	0.007
	140 - 139					36.000	19.2090	-4.741	691.526	0.007
	139 - 138					36.000	19.3376	-4.980	696.153	0.007
L6	138 - 137	TP25.43x24.62x0.25	5.000	0.000	0.0	36.000	19.4661	-6.465	700.781	0.009
	137 - 136					36.000	19.5947	-6.547	705.409	0.009
	136 - 135					36.000	19.7232	-6.631	710.037	0.009
	135 - 134					36.000	19.8518	-6.715	714.664	0.009
	134 - 133					36.000	19.9803	-6.800	719.292	0.009
L7	133 - 132	TP26.24x25.43x0.25	5.000	0.000	0.0	36.000	20.1089	-6.887	723.920	0.010
	132 - 131					36.000	20.2374	-6.975	728.547	0.010
	131 - 130					36.000	20.3660	-7.063	733.175	0.010
	130 - 129					36.000	20.4945	-7.153	737.803	0.010
	129 - 128					36.000	20.6231	-7.244	742.430	0.010
L8	128 - 127	TP27.05x26.24x0.25	5.000	0.000	0.0	36.000	20.7516	-7.347	747.058	0.010
	127 - 126					36.000	20.8802	-8.949	751.686	0.012
	126 - 125					36.000	21.0087	-9.057	756.313	0.012
	125 - 124					36.000	21.1373	-9.166	760.941	0.012
	124 - 123					36.000	21.2658	-9.276	765.569	0.012
L9	123 - 122	TP27.86x27.05x0.25	5.000	0.000	0.0	36.000	21.3943	-9.391	770.197	0.012
	122 - 121					36.000	21.5229	-9.507	774.824	0.012
	121 - 120					36.000	21.6514	-9.624	779.452	0.012
	120 - 119					36.000	21.7800	-9.742	784.080	0.012
	119 - 118					36.000	21.9085	-11.064	788.707	0.014
L10	118 - 116.917	TP28.994x27.86x0.25	7.000	0.000	0.0	36.000	22.0478	-11.199	793.721	0.014
	116.917 - 115.833					36.000	22.1871	-11.336	798.734	0.014
	115.833 - 114.75					36.000	22.3263	-11.475	803.747	0.014
	114.75 - 111					36.000	22.8084	-5.536	821.101	0.007
L11	114.75 - 111	TP28.6964x27.8865x0.3125	5.000	0.000	0.0	36.000	27.9525	-6.718	1006.290	0.007
	111 - 109.75					36.000	28.1533	-12.446	1013.520	0.012
L12	109.75 -	TP29.4254x28.6964x0.3125	4.500	0.000	0.0	36.000	28.3341	-12.630	1020.030	0.012

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 $\frac{P}{P_a}$
	108.625									
	108.625 - 107.5					36.000	28.5148	-12.814	1026.530	0.012
	107.5 - 106.375					36.000	28.6956	-12.999	1033.040	0.013
	106.375 - 105.25					36.000	28.8763	-13.185	1039.550	0.013
L13	105.25 - 104.25	TP30.2353x29.4254x0.4625	5.000	0.000	0.0	36.000	42.7546	-13.419	1539.160	0.009
	104.25 - 103.25					36.000	42.9924	-13.648	1547.730	0.009
	103.25 - 102.25					36.000	43.2302	-13.878	1556.290	0.009
	102.25 - 101.25					36.000	43.4679	-14.109	1564.850	0.009
	101.25 - 100.25					36.000	43.7057	-14.341	1573.410	0.009
L14	100.25 - 99.25	TP31.0452x30.2353x0.4575	5.000	0.000	0.0	36.000	43.4757	-14.573	1565.130	0.009
	99.25 - 98.25					36.000	43.7109	-14.807	1573.590	0.009
	98.25 - 97.25					36.000	43.9462	-15.042	1582.060	0.010
	97.25 - 96.25					36.000	44.1814	-15.278	1590.530	0.010
	96.25 - 95.25					36.000	44.4166	-15.514	1599.000	0.010
L15	95.25 - 94.25	TP31.8552x31.0452x0.4525	5.000	0.000	0.0	36.000	44.1710	-15.751	1590.160	0.010
	94.25 - 93.25					36.000	44.4037	-15.990	1598.530	0.010
	93.25 - 92.25					36.000	44.6363	-16.229	1606.910	0.010
	92.25 - 91.25					36.000	44.8690	-16.469	1615.280	0.010
	91.25 - 90.25					36.000	45.1016	-16.710	1623.660	0.010
L16	90.25 - 89.25	TP32.6651x31.8552x0.4475	5.000	0.000	0.0	36.000	44.8404	-16.952	1614.260	0.011
	89.25 - 88.25					36.000	45.0705	-17.194	1622.540	0.011
	88.25 - 87.25					36.000	45.3006	-17.438	1630.820	0.011
	87.25 - 86.25					36.000	45.5307	-17.683	1639.100	0.011
	86.25 - 85.25					36.000	45.7608	-17.928	1647.390	0.011
L17	85.25 - 84.1875	TP34.042x32.6651x0.4425	8.500	0.000	0.0	36.000	45.4982	-18.189	1637.940	0.011
	84.1875 - 83.125					36.000	45.7400	-18.452	1646.640	0.011
	83.125 - 82.0625					36.000	45.9817	-18.716	1655.340	0.011
	82.0625 - 81					36.000	46.2234	-18.981	1664.040	0.011
	81 - 76.75					36.000	47.1903	-11.277	1698.850	0.007
L18	81 - 76.75	TP33.579x32.7286x0.375 H1-3+VT (1.36 CR) - 18	5.250	0.000	0.0	39.000	39.3282	-9.274	1533.800	0.006
	76.75 - 75.75	H1-3+VT (1.36 CR) - 18				39.000	39.5210	-20.761	1541.320	0.013
L19	75.75 - 74.75	TP34.3889x33.579x0.375 H1-3+VT (1.41 CR) - 19/4	5.000	0.000	0.0	39.000	39.7138	-20.983	1548.840	0.014
	74.75 - 73.75	H1-3+VT (1.41 CR) - 19/3				39.000	39.9066	-21.206	1556.360	0.014
	73.75 - 72.75	H1-3+VT (1.41 CR) - 19/2				39.000	40.0994	-21.430	1563.880	0.014
	72.75 - 71.75	H1-3+VT (1.41 CR) - 19				39.000	40.2922	-21.655	1571.400	0.014
	71.75 - 70.75	H1-3+VT (1.41 CR) - 19				39.000	40.4851	-21.881	1578.920	0.014
L20	70.75 - 69.75	TP35.1988x34.3889x0.55	5.000	0.000	0.0	39.000	59.3554	-22.191	2314.860	0.010
	69.75 - 68.75					39.000	59.6381	-22.498	2325.890	0.010
	68.75 - 67.75					39.000	59.9209	-22.805	2336.920	0.010
	67.75 - 66.75					39.000	60.2037	-23.114	2347.940	0.010
	66.75 - 65.75					39.000	60.4865	-23.423	2358.970	0.010
L21	65.75 - 64.75	TP36.0088x35.1988x0.545	5.000	0.000	0.0	39.000	60.2254	-23.733	2348.790	0.010
	64.75 - 63.75					39.000	60.5057	-24.044	2359.720	0.010
	63.75 - 62.75					39.000	60.7859	-24.355	2370.650	0.010
	62.75 - 61.75					39.000	61.0661	-24.668	2381.580	0.010
	61.75 - 60.75					39.000	61.3463	-24.982	2392.500	0.010
L22	60.75 - 59.75	TP36.8187x36.0088x0.54	5.000	0.000	0.0	39.000	61.0697	-25.296	2381.720	0.011
	59.75 - 58.75					39.000	61.3473	-25.611	2392.550	0.011
	58.75 - 57.75					39.000	61.6249	-25.927	2403.370	0.011
	57.75 - 56.75					39.000	61.9026	-26.244	2414.200	0.011

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 $\frac{P}{P_a}$
	56.75 - 55.75					39.000	62.1802	-26.562	2425.030	0.011
L23	55.75 - 54.75	TP37.6286x36.8187x0.535	5.000	0.000	0.0	39.000	61.8880	-26.881	2413.630	0.011
	54.75 - 53.75					39.000	62.1631	-27.200	2424.360	0.011
	53.75 - 52.75					39.000	62.4382	-27.520	2435.090	0.011
	52.75 - 51.75					39.000	62.7132	-27.842	2445.820	0.011
	51.75 - 50.75					39.000	62.9883	-28.164	2456.540	0.011
L24	50.75 - 49.375	TP38.884x37.6286x0.535	7.750	0.000	0.0	39.000	63.3665	-28.699	2471.290	0.012
	49.375 - 48					39.000	63.7447	-29.241	2486.040	0.012
	48 - 43					39.000	65.1201	-14.843	2539.680	0.006
L25	48 - 43	TP38.2961x37.3241x0.6675	6.000	0.000	0.0	39.000	79.3783	-17.596	3095.760	0.006
	43 - 42					39.000	79.7216	-32.856	3109.140	0.011
L26	42 - 41	TP39.1061x38.2961x0.6625	5.000	0.000	0.0	39.000	79.4756	-33.254	3099.550	0.011
	41 - 40					39.000	79.8162	-33.653	3112.830	0.011
	40 - 39					39.000	80.1569	-34.054	3126.120	0.011
	39 - 38					39.000	80.4975	-34.456	3139.400	0.011
	38 - 37					39.000	80.8382	-34.859	3152.690	0.011
L27	37 - 36	TP39.916x39.1061x0.6575	5.000	0.000	0.0	39.000	80.5766	-35.261	3142.490	0.011
	36 - 35					39.000	80.9146	-35.665	3155.670	0.011
	35 - 34					39.000	81.2527	-36.070	3168.860	0.011
	34 - 33					39.000	81.5908	-36.476	3182.040	0.011
	33 - 32					39.000	81.9289	-36.884	3195.230	0.012
L28	32 - 30.75	TP40.5235x39.916x0.6525	3.750	0.000	0.0	39.000	81.7356	-37.463	3187.690	0.012
	30.75 - 29.5					39.000	82.1549	-38.047	3204.040	0.012
	29.5 - 28.25					39.000	82.5743	-38.632	3220.400	0.012
L29	28.25 - 28.08	TP40.5511x40.5235x0.7975	0.170	0.000	0.0	39.000	100.6270	-38.738	3924.450	0.010
	(29)									
L30	28.08 - 27.25	TP40.6855x40.5511x0.8875	0.830	0.000	0.0	39.000	112.1080	-39.214	4372.220	0.009
	(30)									
L31	27.25 - 26.25	TP41.4955x40.6855x0.6625	5.000	0.000	0.0	39.000	84.5001	-39.673	3295.500	0.012
	26.25 - 25.25					39.000	84.8407	-40.137	3308.790	0.012
	25.25 - 24.25					39.000	85.1814	-40.603	3322.070	0.012
	24.25 - 23.25					39.000	85.5220	-41.069	3335.360	0.012
	23.25 - 22.25					39.000	85.8627	-41.537	3348.640	0.012
L32	22.25 - 21.25	TP42.3055x41.4955x0.6525	5.000	0.000	0.0	39.000	84.9229	-41.968	3311.990	0.013
	21.25 - 20.25					39.000	85.2584	-42.401	3325.080	0.013
	20.25 - 19.25					39.000	85.5939	-42.834	3338.160	0.013
	19.25 - 18.25					39.000	85.9294	-43.269	3351.250	0.013
	18.25 - 17.25					39.000	86.2649	-43.705	3364.330	0.013
L33	17.25 - 16 (33)	TP42.508x42.3055x0.6525	1.250	0.000	0.0	39.000	86.6843	-44.313	3380.690	0.013
L34	16 - 14.58 (34)	TP42.7381x42.508x0.8025	1.420	0.000	0.0	39.000	106.8160	-45.144	4165.810	0.011
L35	14.58 - 13.415	TP43.1155x42.7381x0.7125	2.330	0.000	0.0	39.000	95.4666	-45.819	3723.200	0.012
	13.415 - 12.25					39.000	95.8934	-46.495	3739.840	0.012
L36	12.25 - 11.125	TP43.48x43.1155x0.8175	2.250	0.000	0.0	39.000	110.2250	-47.193	4298.790	0.011
	11.125 - 10					39.000	110.6980	-47.891	4317.240	0.011
L37	10 - 9	TP44.29x43.48x0.7225	5.000	0.000	0.0	39.000	98.4237	-48.403	3838.520	0.013
	9 - 8					39.000	98.7952	-48.916	3853.010	0.013
	8 - 7					39.000	99.1667	-49.430	3867.500	0.013
	7 - 6					39.000	99.5382	-49.945	3881.990	0.013
	6 - 5					39.000	99.9097	-50.462	3896.480	0.013
L38	5 - 4	TP45.1x44.29x0.7175	5.000	0.000	0.0	39.000	99.5986	-50.942	3884.340	0.013
	4 - 3					39.000	99.9675	-51.423	3898.730	0.013
	3 - 2					39.000	100.3360	-51.905	3913.120	0.013
	2 - 1					39.000	100.7050	-52.389	3927.510	0.013
	1 - 0					39.000	101.0740	-52.873	3941.900	0.013

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	160 - 159	TP10x10x0.322	0.013	0.007	23.100	0.000	0.000	0.000	23.100	0.000
	159 - 158		0.051	0.027	23.100	0.001	0.000	0.000	23.100	0.000
	158 - 157		0.115	0.060	23.100	0.003	0.000	0.000	23.100	0.000
	157 - 156		6.516	3.407	23.100	0.147	0.000	0.000	23.100	0.000
	156 - 155		9.924	5.189	23.100	0.225	0.000	0.000	23.100	0.000
L2	155 - 154	TP10x10x0.322	13.358	6.985	23.100	0.302	0.000	0.000	23.100	0.000
	154 - 153		16.817	8.793	23.100	0.381	0.000	0.000	23.100	0.000
	153 - 152		20.300	10.615	23.100	0.460	0.000	0.000	23.100	0.000
	152 - 151		23.809	12.449	23.100	0.539	0.000	0.000	23.100	0.000
	151 - 150		27.342	14.296	23.100	0.619	0.000	0.000	23.100	0.000
L3	150 - 149	TP10x10x0.322	30.899	16.156	23.100	0.699	0.000	0.000	23.100	0.000
	149 - 148		34.480	18.029	23.100	0.780	0.000	0.000	23.100	0.000
L4	148 - 147	TP23.81x23x0.25	40.855	4.784	36.000	0.133	0.000	0.000	36.000	0.000
	147 - 146		47.288	5.459	36.000	0.152	0.000	0.000	36.000	0.000
	146 - 145		55.246	6.289	36.000	0.175	0.000	0.000	36.000	0.000
	145 - 144		63.264	7.102	36.000	0.197	0.000	0.000	36.000	0.000
	144 - 143		71.343	7.898	36.000	0.219	0.000	0.000	36.000	0.000
L5	143 - 142	TP24.62x23.81x0.25	79.483	8.679	36.000	0.241	0.000	0.000	36.000	0.000
	142 - 141		87.684	9.445	36.000	0.262	0.000	0.000	36.000	0.000
	141 - 140		95.947	10.195	36.000	0.283	0.000	0.000	36.000	0.000
	140 - 139		104.272	10.931	36.000	0.304	0.000	0.000	36.000	0.000
	139 - 138		113.321	11.722	36.000	0.326	0.000	0.000	36.000	0.000
L6	138 - 137	TP25.43x24.62x0.25	128.555	13.122	36.000	0.364	0.000	0.000	36.000	0.000
	137 - 136		143.710	14.476	36.000	0.402	0.000	0.000	36.000	0.000
	136 - 135		158.935	15.800	36.000	0.439	0.000	0.000	36.000	0.000
	135 - 134		174.231	17.096	36.000	0.475	0.000	0.000	36.000	0.000
	134 - 133		189.598	18.364	36.000	0.510	0.000	0.000	36.000	0.000
L7	133 - 132	TP26.24x25.43x0.25	205.033	19.605	36.000	0.545	0.000	0.000	36.000	0.000
	132 - 131		220.539	20.819	36.000	0.578	0.000	0.000	36.000	0.000
	131 - 130		236.114	22.008	36.000	0.611	0.000	0.000	36.000	0.000
	130 - 129		251.760	23.171	36.000	0.644	0.000	0.000	36.000	0.000
	129 - 128		267.475	24.310	36.000	0.675	0.000	0.000	36.000	0.000
L8	128 - 127	TP27.05x26.24x0.25	283.262	25.426	36.000	0.706	0.000	0.000	36.000	0.000
	127 - 126		304.261	26.974	36.000	0.749	0.000	0.000	36.000	0.000
	126 - 125		323.355	28.315	36.000	0.787	0.000	0.000	36.000	0.000
	125 - 124		342.526	29.628	36.000	0.823	0.000	0.000	36.000	0.000
	124 - 123		361.772	30.914	36.000	0.859	0.000	0.000	36.000	0.000
L9	123 - 122	TP27.86x27.05x0.25	381.092	32.173	36.000	0.894	0.000	0.000	36.000	0.000
	122 - 121		400.489	33.406	36.000	0.928	0.000	0.000	36.000	0.000
	121 - 120		419.962	34.614	36.000	0.962	0.000	0.000	36.000	0.000
	120 - 119		439.512	35.797	36.000	0.994	0.000	0.000	36.000	0.000
	119 - 118		462.106	37.195	36.000	1.033	0.000	0.000	36.000	0.000
L10	118 - 116.917	TP28.994x27.86x0.25	484.637	38.515	36.000	1.070	0.000	0.000	36.000	0.000
	116.917 - 115.833		507.255	39.806	36.000	1.106	0.000	0.000	36.000	0.000
	115.833 - 114.75		529.958	41.068	36.000	1.141	0.000	0.000	36.000	0.000
	114.75 - 111		279.902	20.779	36.000	0.577	0.000	0.000	36.000	0.000
L11	114.75 - 111	TP28.6964x27.8865x0.3125	329.423	20.402	36.000	0.567	0.000	0.000	36.000	0.000
	111 - 109.75		636.051	38.829	36.000	1.079	0.000	0.000	36.000	0.000
L12	109.75 - 108.625	TP29.4254x28.6964x0.3125	660.202	39.788	36.000	1.105	0.000	0.000	36.000	0.000
	108.625 - 107.5		684.448	40.725	36.000	1.131	0.000	0.000	36.000	0.000
	107.5 - 106.375		708.789	41.641	36.000	1.157	0.000	0.000	36.000	0.000
	106.375 - 105.25		733.224	42.536	36.000	1.182	0.000	0.000	36.000	0.000
L13	105.25 - 104.25	TP30.2353x29.4254x0.4625	755.029	29.721	36.000	0.826	0.000	0.000	36.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	104.25 - 103.25		776.917	30.243	36.000	0.840	0.000	0.000	36.000	0.000
	103.25 - 102.25		798.888	30.754	36.000	0.854	0.000	0.000	36.000	0.000
	102.25 - 101.25		820.944	31.256	36.000	0.868	0.000	0.000	36.000	0.000
	101.25 - 100.25		843.083	31.748	36.000	0.882	0.000	0.000	36.000	0.000
L14	100.25 - 99.25	TP31.0452x30.2353x0.4575	865.308	32.566	36.000	0.905	0.000	0.000	36.000	0.000
	99.25 - 98.25		887.608	33.044	36.000	0.918	0.000	0.000	36.000	0.000
	98.25 - 97.25		910.000	33.514	36.000	0.931	0.000	0.000	36.000	0.000
	97.25 - 96.25		932.467	33.974	36.000	0.944	0.000	0.000	36.000	0.000
	96.25 - 95.25		955.017	34.425	36.000	0.956	0.000	0.000	36.000	0.000
L15	95.25 - 94.25	TP31.8552x31.0452x0.4525	977.650	35.236	36.000	0.979	0.000	0.000	36.000	0.000
	94.25 - 93.25		1000.358	35.675	36.000	0.991	0.000	0.000	36.000	0.000
	93.25 - 92.25		1023.150	36.106	36.000	1.003	0.000	0.000	36.000	0.000
	92.25 - 91.25		1046.025	36.528	36.000	1.015	0.000	0.000	36.000	0.000
	91.25 - 90.25		1068.975	36.943	36.000	1.026	0.000	0.000	36.000	0.000
L16	90.25 - 89.25	TP32.6651x31.8552x0.4475	1092.008	37.749	36.000	1.049	0.000	0.000	36.000	0.000
	89.25 - 88.25		1115.117	38.153	36.000	1.060	0.000	0.000	36.000	0.000
	88.25 - 87.25		1138.300	38.548	36.000	1.071	0.000	0.000	36.000	0.000
	87.25 - 86.25		1161.567	38.937	36.000	1.082	0.000	0.000	36.000	0.000
	86.25 - 85.25		1184.908	39.318	36.000	1.092	0.000	0.000	36.000	0.000
L17	85.25 - 84.1875	TP34.042x32.6651x0.4425	1209.792	40.146	36.000	1.115	0.000	0.000	36.000	0.000
	84.1875 - 83.125		1234.758	40.540	36.000	1.126	0.000	0.000	36.000	0.000
	83.125 - 82.0625		1259.808	40.926	36.000	1.137	0.000	0.000	36.000	0.000
	82.0625 - 81		1284.950	41.304	36.000	1.147	0.000	0.000	36.000	0.000
	81 - 76.75		767.957	23.678	36.000	0.658	0.000	0.000	36.000	0.000
L18	81 - 76.75	TP33.579x32.7286x0.375	618.535	23.227	39.000	0.596	0.000	0.000	39.000	0.000
	76.75 - 75.75		1410.608	52.453	39.000	1.345	0.000	0.000	39.000	0.000
L19	75.75 - 74.75	TP34.3889x33.579x0.375	1434.792	52.833	39.000	1.355	0.000	0.000	39.000	0.000
	74.75 - 73.75		1459.033	53.205	39.000	1.364	0.000	0.000	39.000	0.000
	73.75 - 72.75		1483.333	53.569	39.000	1.374	0.000	0.000	39.000	0.000
	72.75 - 71.75		1507.700	53.926	39.000	1.383	0.000	0.000	39.000	0.000
	71.75 - 70.75		1532.125	54.277	39.000	1.392	0.000	0.000	39.000	0.000
L20	70.75 - 69.75	TP35.1988x34.3889x0.55	1556.625	37.819	39.000	0.970	0.000	0.000	39.000	0.000
	69.75 - 68.75		1581.192	38.050	39.000	0.976	0.000	0.000	39.000	0.000
	68.75 - 67.75		1605.833	38.276	39.000	0.981	0.000	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	67.75 - 66.75		1630.542	38.498	39.000	0.987	0.000	0.000	39.000	0.000
	66.75 - 65.75		1655.325	38.715	39.000	0.993	0.000	0.000	39.000	0.000
L21	65.75 - 64.75	TP36.0088x35.1988x0.545	1680.183	39.269	39.000	1.007	0.000	0.000	39.000	0.000
	64.75 - 63.75		1705.108	39.481	39.000	1.012	0.000	0.000	39.000	0.000
	63.75 - 62.75		1730.100	39.688	39.000	1.018	0.000	0.000	39.000	0.000
	62.75 - 61.75		1755.167	39.892	39.000	1.023	0.000	0.000	39.000	0.000
	61.75 - 60.75		1780.300	40.091	39.000	1.028	0.000	0.000	39.000	0.000
L22	60.75 - 59.75	TP36.8187x36.0088x0.54	1805.500	40.643	39.000	1.042	0.000	0.000	39.000	0.000
	59.75 - 58.75		1830.767	40.837	39.000	1.047	0.000	0.000	39.000	0.000
	58.75 - 57.75		1856.100	41.027	39.000	1.052	0.000	0.000	39.000	0.000
	57.75 - 56.75		1881.500	41.214	39.000	1.057	0.000	0.000	39.000	0.000
	56.75 - 55.75		1906.967	41.397	39.000	1.061	0.000	0.000	39.000	0.000
L23	55.75 - 54.75	TP37.6286x36.8187x0.535	1932.500	41.947	39.000	1.076	0.000	0.000	39.000	0.000
	54.75 - 53.75		1958.092	42.125	39.000	1.080	0.000	0.000	39.000	0.000
	53.75 - 52.75		1983.750	42.299	39.000	1.085	0.000	0.000	39.000	0.000
	52.75 - 51.75		2009.475	42.470	39.000	1.089	0.000	0.000	39.000	0.000
	51.75 - 50.75		2035.258	42.637	39.000	1.093	0.000	0.000	39.000	0.000
L24	50.75 - 49.375	TP38.884x37.6286x0.535	2070.808	42.862	39.000	1.099	0.000	0.000	39.000	0.000
	49.375 - 48		2106.475	43.081	39.000	1.105	0.000	0.000	39.000	0.000
	48 - 43		1034.675	20.270	39.000	0.520	0.000	0.000	39.000	0.000
L25	48 - 43	TP38.2961x37.3241x0.6675	1202.767	19.861	39.000	0.509	0.000	0.000	39.000	0.000
	43 - 42		2263.867	37.060	39.000	0.950	0.000	0.000	39.000	0.000
L26	42 - 41	TP39.1061x38.2961x0.6625	2290.358	37.435	39.000	0.960	0.000	0.000	39.000	0.000
	41 - 40		2316.908	37.544	39.000	0.963	0.000	0.000	39.000	0.000
	40 - 39		2343.508	37.650	39.000	0.965	0.000	0.000	39.000	0.000
	39 - 38		2370.167	37.754	39.000	0.968	0.000	0.000	39.000	0.000
	38 - 37		2396.883	37.856	39.000	0.971	0.000	0.000	39.000	0.000
L27	37 - 36	TP39.916x39.1061x0.6575	2423.650	38.229	39.000	0.980	0.000	0.000	39.000	0.000
	36 - 35		2450.475	38.327	39.000	0.983	0.000	0.000	39.000	0.000
	35 - 34		2477.350	38.423	39.000	0.985	0.000	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	34 - 33		2504.283	38.517	39.000	0.988	0.000	0.000	39.000	0.000
	33 - 32		2531.258	38.609	39.000	0.990	0.000	0.000	39.000	0.000
L28	32 - 30.75	TP40.5235x39.916x0.6525	2565.058	39.002	39.000	1.000	0.000	0.000	39.000	0.000
	30.75 - 29.5		2598.933	39.112	39.000	1.003	0.000	0.000	39.000	0.000
	29.5 - 28.25		2632.892	39.218	39.000	1.006	0.000	0.000	39.000	0.000
L29	28.25 - 28.08 (29)	TP40.5511x40.5235x0.7975	2637.517	32.452	39.000	0.832	0.000	0.000	39.000	0.000
L30	28.08 - 27.25 (30)	TP40.6855x40.5511x0.8875	2660.125	29.410	39.000	0.754	0.000	0.000	39.000	0.000
L31	27.25 - 26.25	TP41.4955x40.6855x0.6625	2687.400	38.817	39.000	0.995	0.000	0.000	39.000	0.000
	26.25 - 25.25		2714.733	38.895	39.000	0.997	0.000	0.000	39.000	0.000
	25.25 - 24.25		2742.117	38.971	39.000	0.999	0.000	0.000	39.000	0.000
	24.25 - 23.25		2769.550	39.045	39.000	1.001	0.000	0.000	39.000	0.000
	23.25 - 22.25		2797.025	39.118	39.000	1.003	0.000	0.000	39.000	0.000
L32	22.25 - 21.25	TP42.3055x41.4955x0.6525	2824.550	39.761	39.000	1.020	0.000	0.000	39.000	0.000
	21.25 - 20.25		2852.125	39.831	39.000	1.021	0.000	0.000	39.000	0.000
	20.25 - 19.25		2879.750	39.900	39.000	1.023	0.000	0.000	39.000	0.000
	19.25 - 18.25		2907.417	39.966	39.000	1.025	0.000	0.000	39.000	0.000
	18.25 - 17.25		2935.125	40.032	39.000	1.026	0.000	0.000	39.000	0.000
L33	17.25 - 16 (33)	TP42.508x42.3055x0.6525	2969.833	40.111	39.000	1.028	0.000	0.000	39.000	0.000
L34	16 - 14.58 (34)	TP42.7381x42.508x0.8025	3009.350	33.037	39.000	0.847	0.000	0.000	39.000	0.000
L35	14.58 - 13.415	TP43.1155x42.7381x0.7125	3041.850	37.034	39.000	0.950	0.000	0.000	39.000	0.000
	13.415 - 12.25		3074.417	37.096	39.000	0.951	0.000	0.000	39.000	0.000
L36	12.25 - 11.125	TP43.48x43.1155x0.8175	3105.925	32.622	39.000	0.836	0.000	0.000	39.000	0.000
	11.125 - 10		3137.500	32.670	39.000	0.838	0.000	0.000	39.000	0.000
L37	10 - 9	TP44.29x43.48x0.7225	3165.625	36.767	39.000	0.943	0.000	0.000	39.000	0.000
	9 - 8		3193.783	36.814	39.000	0.944	0.000	0.000	39.000	0.000
	8 - 7		3222.000	36.859	39.000	0.945	0.000	0.000	39.000	0.000
	7 - 6		3250.258	36.903	39.000	0.946	0.000	0.000	39.000	0.000
	6 - 5		3278.558	36.946	39.000	0.947	0.000	0.000	39.000	0.000
L38	5 - 4	TP45.1x44.29x0.7175	3306.908	37.232	39.000	0.955	0.000	0.000	39.000	0.000
	4 - 3		3335.300	37.273	39.000	0.956	0.000	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	3 - 2		3363.733	37.313	39.000	0.957	0.000	0.000	39.000	0.000
	2 - 1		3392.208	37.351	39.000	0.958	0.000	0.000	39.000	0.000
	1 - 0		3420.733	37.389	39.000	0.959	0.000	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	160 - 159	TP10x10x0.322	0.026	0.003	14.000	0.000	0.000	0.000	14.000	0.000
	159 - 158		0.052	0.005	14.000	0.001	0.000	0.000	14.000	0.000
	158 - 157		0.077	0.008	14.000	0.001	0.000	0.000	14.000	0.000
	157 - 156		3.396	0.347	14.000	0.050	0.714	0.181	14.000	0.013
	156 - 155		3.422	0.349	14.000	0.050	0.714	0.181	14.000	0.013
L2	155 - 154	TP10x10x0.322	3.447	0.352	14.000	0.050	0.714	0.181	14.000	0.013
	154 - 153		3.472	0.355	14.000	0.051	0.714	0.181	14.000	0.013
	153 - 152		3.497	0.357	14.000	0.051	0.714	0.181	14.000	0.013
	152 - 151		3.522	0.360	14.000	0.051	0.714	0.181	14.000	0.013
	151 - 150		3.546	0.362	14.000	0.052	0.714	0.181	14.000	0.013
L3	150 - 149	TP10x10x0.322	3.570	0.365	14.000	0.052	0.714	0.181	14.000	0.013
	149 - 148		3.594	0.367	14.000	0.052	0.714	0.181	14.000	0.013
L4	148 - 147	TP23.81x23x0.25	6.408	0.352	24.000	0.029	0.922	0.053	24.000	0.002
	147 - 146		6.469	0.353	24.000	0.029	0.922	0.052	24.000	0.002
	146 - 145		7.992	0.433	24.000	0.036	0.974	0.054	24.000	0.002
	145 - 144		8.054	0.434	24.000	0.036	0.974	0.053	24.000	0.002
	144 - 143		8.115	0.434	24.000	0.036	0.974	0.052	24.000	0.002
L5	143 - 142	TP24.62x23.81x0.25	8.176	0.434	24.000	0.036	0.974	0.052	24.000	0.002
	142 - 141		8.238	0.435	24.000	0.036	0.974	0.051	24.000	0.002
	141 - 140		8.299	0.435	24.000	0.036	0.974	0.050	24.000	0.002
	140 - 139		8.361	0.435	24.000	0.036	0.974	0.050	24.000	0.002
	139 - 138		8.828	0.457	24.000	0.038	0.974	0.049	24.000	0.002
L6	138 - 137	TP25.43x24.62x0.25	15.127	0.777	24.000	0.065	0.973	0.048	24.000	0.002
	137 - 136		15.198	0.776	24.000	0.065	0.499	0.024	24.000	0.001
	136 - 135		15.268	0.774	24.000	0.064	0.498	0.024	24.000	0.001
	135 - 134		15.339	0.773	24.000	0.064	0.497	0.024	24.000	0.001
	134 - 133		15.409	0.771	24.000	0.064	0.495	0.023	24.000	0.001
L7	133 - 132	TP26.24x25.43x0.25	15.479	0.770	24.000	0.064	0.494	0.023	24.000	0.001
	132 - 131		15.549	0.768	24.000	0.064	0.493	0.023	24.000	0.001
	131 - 130		15.619	0.767	24.000	0.064	0.492	0.022	24.000	0.001
	130 - 129		15.689	0.766	24.000	0.064	0.490	0.022	24.000	0.001
	129 - 128		15.759	0.764	24.000	0.064	0.489	0.022	24.000	0.001
L8	128 - 127	TP27.05x26.24x0.25	15.836	0.763	24.000	0.064	0.488	0.021	24.000	0.001
	127 - 126		19.068	0.913	24.000	0.076	0.485	0.021	24.000	0.001
	126 - 125		19.144	0.911	24.000	0.076	0.483	0.021	24.000	0.001
	125 - 124		19.220	0.909	24.000	0.076	0.481	0.020	24.000	0.001
	124 - 123		19.296	0.907	24.000	0.076	0.478	0.020	24.000	0.001
L9	123 - 122	TP27.86x27.05x0.25	19.372	0.905	24.000	0.075	0.476	0.020	24.000	0.001
	122 - 121		19.448	0.904	24.000	0.075	0.473	0.019	24.000	0.001
	121 - 120		19.525	0.902	24.000	0.075	0.470	0.019	24.000	0.001
	120 - 119		19.601	0.900	24.000	0.075	0.467	0.019	24.000	0.001
	119 - 118		20.764	0.948	24.000	0.079	0.446	0.017	24.000	0.001
L10	118 - 116.917	TP28.994x27.86x0.25	20.843	0.945	24.000	0.079	0.443	0.017	24.000	0.001
	116.917 -		20.923	0.943	24.000	0.079	0.440	0.017	24.000	0.001

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 $\frac{f_{vt}}{F_{vt}}$
	115.833									
	115.833 - 114.75		21.002	0.941	24.000	0.078	0.437	0.017	24.000	0.001
	114.75 - 111		9.880	0.433	24.000	0.036	0.202	0.007	24.000	0.000
L11	114.75 - 111	TP28.6964x27.8865x0.3125	11.461	0.410	24.000	0.034	0.232	0.007	24.000	0.000
	111 - 109.75		21.432	0.761	24.000	0.063	0.423	0.013	24.000	0.001
L12	109.75 - 108.625	TP29.4254x28.6964x0.3125	21.517	0.759	24.000	0.063	0.420	0.012	24.000	0.001
	108.625 - 107.5		21.601	0.758	24.000	0.063	0.416	0.012	24.000	0.001
	107.5 - 106.375		21.685	0.756	24.000	0.063	0.413	0.012	24.000	0.000
	106.375 - 105.25		21.769	0.754	24.000	0.063	0.410	0.012	24.000	0.000
L13	105.25 - 104.25	TP30.2353x29.4254x0.4625	21.852	0.511	24.000	0.043	0.407	0.008	24.000	0.000
	104.25 - 103.25		21.936	0.510	24.000	0.043	0.404	0.008	24.000	0.000
	103.25 - 102.25		22.020	0.509	24.000	0.042	0.401	0.007	24.000	0.000
	102.25 - 101.25		22.104	0.509	24.000	0.042	0.398	0.007	24.000	0.000
	101.25 - 100.25		22.188	0.508	24.000	0.042	0.395	0.007	24.000	0.000
L14	100.25 - 99.25	TP31.0452x30.2353x0.4575	22.270	0.512	24.000	0.043	0.392	0.007	24.000	0.000
	99.25 - 98.25		22.353	0.511	24.000	0.043	0.389	0.007	24.000	0.000
	98.25 - 97.25		22.435	0.511	24.000	0.043	0.387	0.007	24.000	0.000
	97.25 - 96.25		22.517	0.510	24.000	0.042	0.384	0.007	24.000	0.000
	96.25 - 95.25		22.599	0.509	24.000	0.042	0.381	0.007	24.000	0.000
L15	95.25 - 94.25	TP31.8552x31.0452x0.4525	22.679	0.513	24.000	0.043	0.378	0.007	24.000	0.000
	94.25 - 93.25		22.759	0.513	24.000	0.043	0.375	0.006	24.000	0.000
	93.25 - 92.25		22.839	0.512	24.000	0.043	0.372	0.006	24.000	0.000
	92.25 - 91.25		22.919	0.511	24.000	0.043	0.369	0.006	24.000	0.000
	91.25 - 90.25		22.999	0.510	24.000	0.042	0.366	0.006	24.000	0.000
L16	90.25 - 89.25	TP32.6651x31.8552x0.4475	23.077	0.515	24.000	0.043	0.363	0.006	24.000	0.000
	89.25 - 88.25		23.154	0.514	24.000	0.043	0.360	0.006	24.000	0.000
	88.25 - 87.25		23.232	0.513	24.000	0.043	0.357	0.006	24.000	0.000
	87.25 - 86.25		23.310	0.512	24.000	0.043	0.354	0.006	24.000	0.000
	86.25 - 85.25		23.387	0.511	24.000	0.043	0.351	0.006	24.000	0.000
L17	85.25 - 84.1875	TP34.042x32.6651x0.4425	23.467	0.516	24.000	0.043	0.348	0.006	24.000	0.000
	84.1875 - 83.125		23.547	0.515	24.000	0.043	0.345	0.005	24.000	0.000
	83.125 - 82.0625		23.626	0.514	24.000	0.043	0.342	0.005	24.000	0.000
	82.0625 - 81		23.705	0.513	24.000	0.043	0.339	0.005	24.000	0.000
	81 - 76.75		13.428	0.285	24.000	0.024	0.189	0.003	24.000	0.000
L18	81 - 76.75	TP33.579x32.7286x0.375	10.678	0.272	26.000	0.021	0.147	0.003	26.000	0.000
	76.75 - 75.75		24.158	0.611	26.000	0.047	0.323	0.006	26.000	0.000
L19	75.75 - 74.75	TP34.3889x33.579x0.375	24.221	0.610	26.000	0.047	0.320	0.006	26.000	0.000
	74.75 - 73.75		24.283	0.608	26.000	0.047	0.317	0.006	26.000	0.000
	73.75 - 72.75		24.344	0.607	26.000	0.047	0.314	0.006	26.000	0.000
	72.75 - 71.75		24.406	0.606	26.000	0.047	0.311	0.005	26.000	0.000
	71.75 - 70.75		24.467	0.604	26.000	0.046	0.308	0.005	26.000	0.000
L20	70.75 - 69.75	TP35.1988x34.3889x0.55	24.537	0.413	26.000	0.032	0.305	0.004	26.000	0.000
	69.75 - 68.75		24.610	0.413	26.000	0.032	0.302	0.004	26.000	0.000
	68.75 - 67.75		24.682	0.412	26.000	0.032	0.299	0.003	26.000	0.000
	67.75 - 66.75		24.755	0.411	26.000	0.032	0.296	0.003	26.000	0.000
	66.75 - 65.75		24.827	0.410	26.000	0.032	0.293	0.003	26.000	0.000
L21	65.75 - 64.75	TP36.0088x35.1988x0.545	24.897	0.413	26.000	0.032	0.290	0.003	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	64.75 - 63.75		24.967	0.413	26.000	0.032	0.288	0.003	26.000	0.000
	63.75 - 62.75		25.036	0.412	26.000	0.032	0.285	0.003	26.000	0.000
	62.75 - 61.75		25.105	0.411	26.000	0.032	0.282	0.003	26.000	0.000
	61.75 - 60.75		25.175	0.410	26.000	0.032	0.279	0.003	26.000	0.000
L22	60.75 - 59.75	TP36.8187x36.0088x0.54	25.241	0.413	26.000	0.032	0.276	0.003	26.000	0.000
	59.75 - 58.75		25.308	0.413	26.000	0.032	0.273	0.003	26.000	0.000
	58.75 - 57.75		25.374	0.412	26.000	0.032	0.270	0.003	26.000	0.000
	57.75 - 56.75		25.441	0.411	26.000	0.032	0.267	0.003	26.000	0.000
	56.75 - 55.75		25.506	0.410	26.000	0.032	0.264	0.003	26.000	0.000
L23	55.75 - 54.75	TP37.6286x36.8187x0.535	25.570	0.413	26.000	0.032	0.261	0.003	26.000	0.000
	54.75 - 53.75		25.633	0.412	26.000	0.032	0.258	0.003	26.000	0.000
	53.75 - 52.75		25.696	0.412	26.000	0.032	0.255	0.003	26.000	0.000
	52.75 - 51.75		25.758	0.411	26.000	0.032	0.252	0.003	26.000	0.000
	51.75 - 50.75		25.821	0.410	26.000	0.032	0.249	0.003	26.000	0.000
L24	50.75 - 49.375	TP38.884x37.6286x0.535	25.910	0.409	26.000	0.031	0.246	0.002	26.000	0.000
	49.375 - 48		25.994	0.408	26.000	0.031	0.243	0.002	26.000	0.000
	48 - 43		12.325	0.189	26.000	0.015	0.114	0.001	26.000	0.000
L25	48 - 43	TP38.2961x37.3241x0.6675	14.102	0.178	26.000	0.014	0.124	0.001	26.000	0.000
	43 - 42		26.466	0.332	26.000	0.026	0.224	0.002	26.000	0.000
L26	42 - 41	TP39.1061x38.2961x0.6625	26.524	0.334	26.000	0.026	0.221	0.002	26.000	0.000
	41 - 40		26.581	0.333	26.000	0.026	0.218	0.002	26.000	0.000
	40 - 39		26.638	0.332	26.000	0.026	0.216	0.002	26.000	0.000
	39 - 38		26.695	0.332	26.000	0.026	0.213	0.002	26.000	0.000
	38 - 37		26.751	0.331	26.000	0.025	0.210	0.002	26.000	0.000
L27	37 - 36	TP39.916x39.1061x0.6575	26.804	0.333	26.000	0.026	0.207	0.002	26.000	0.000
	36 - 35		26.857	0.332	26.000	0.026	0.205	0.002	26.000	0.000
	35 - 34		26.909	0.331	26.000	0.025	0.202	0.002	26.000	0.000
	34 - 33		26.961	0.330	26.000	0.025	0.199	0.001	26.000	0.000
	33 - 32		27.013	0.330	26.000	0.025	0.196	0.001	26.000	0.000
L28	32 - 30.75	TP40.5235x39.916x0.6525	27.081	0.331	26.000	0.025	0.194	0.001	26.000	0.000
	30.75 - 29.5		27.145	0.330	26.000	0.025	0.190	0.001	26.000	0.000
	29.5 - 28.25		27.209	0.330	26.000	0.025	0.187	0.001	26.000	0.000
L29	28.25 - 28.08 (29)	TP40.5511x40.5235x0.7975	27.216	0.270	26.000	0.021	0.183	0.001	26.000	0.000
L30	28.08 - 27.25 (30)	TP40.6855x40.5511x0.8875	27.259	0.243	26.000	0.019	0.183	0.001	26.000	0.000
L31	27.25 - 26.25	TP41.4955x40.6855x0.6625	27.315	0.323	26.000	0.025	0.181	0.001	26.000	0.000
	26.25 - 25.25		27.364	0.323	26.000	0.025	0.178	0.001	26.000	0.000
	25.25 - 24.25		27.414	0.322	26.000	0.025	0.175	0.001	26.000	0.000
	24.25 - 23.25		27.463	0.321	26.000	0.025	0.172	0.001	26.000	0.000
	23.25 - 22.25		27.511	0.320	26.000	0.025	0.170	0.001	26.000	0.000
L32	22.25 - 21.25	TP42.3055x41.4955x0.6525	27.559	0.325	26.000	0.025	0.167	0.001	26.000	0.000
	21.25 - 20.25		27.605	0.324	26.000	0.025	0.164	0.001	26.000	0.000
	20.25 - 19.25		27.652	0.323	26.000	0.025	0.161	0.001	26.000	0.000
	19.25 - 18.25		27.698	0.322	26.000	0.025	0.158	0.001	26.000	0.000
	18.25 - 17.25		27.744	0.322	26.000	0.025	0.155	0.001	26.000	0.000
L33	17.25 - 16 (33)	TP42.508x42.3055x0.6525	27.806	0.321	26.000	0.025	0.152	0.001	26.000	0.000
L34	16 - 14.58 (34)	TP42.7381x42.508x0.8025	27.880	0.261	26.000	0.020	0.149	0.001	26.000	0.000
L35	14.58 - 13.415	TP43.1155x42.7381x0.7125	27.935	0.293	26.000	0.023	0.145	0.001	26.000	0.000
	13.415 - 12.25		27.991	0.292	26.000	0.022	0.141	0.001	26.000	0.000
L36	12.25 - 11.125	TP43.48x43.1155x0.8175	28.047	0.254	26.000	0.020	0.138	0.001	26.000	0.000
	11.125 - 10		28.104	0.254	26.000	0.020	0.135	0.001	26.000	0.000
L37	10 - 9	TP44.29x43.48x0.7225	28.151	0.286	26.000	0.022	0.131	0.001	26.000	0.000
	9 - 8		28.197	0.285	26.000	0.022	0.128	0.001	26.000	0.000
	8 - 7		28.243	0.285	26.000	0.022	0.125	0.001	26.000	0.000
	7 - 6		28.288	0.284	26.000	0.022	0.123	0.001	26.000	0.000
	6 - 5		28.333	0.284	26.000	0.022	0.120	0.001	26.000	0.000
L38	5 - 4	TP45.1x44.29x0.7175	28.378	0.285	26.000	0.022	0.117	0.001	26.000	0.000
	4 - 3		28.422	0.284	26.000	0.022	0.114	0.001	26.000	0.000
	3 - 2		28.466	0.284	26.000	0.022	0.111	0.001	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	2 - 1		28.509	0.283	26.000	0.022	0.108	0.001	26.000	0.000
	1 - 0		28.552	0.282	26.000	0.022	0.104	0.001	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	160 - 159	0.000	0.000	0.000	0.000	0.000	0.000 ✔	1.333	H1-3+VT ✔
	159 - 158	0.000	0.001	0.000	0.001	0.000	0.001 ✔	1.333	H1-3+VT ✔
	158 - 157	0.000	0.003	0.000	0.001	0.000	0.003 ✔	1.333	H1-3+VT ✔
	157 - 156	0.004	0.147	0.000	0.050	0.013	0.153 ✔	1.333	H1-3+VT ✔
	156 - 155	0.005	0.225	0.000	0.050	0.013	0.231 ✔	1.333	H1-3+VT ✔
L2	155 - 154	0.005	0.302	0.000	0.050	0.013	0.309 ✔	1.333	H1-3+VT ✔
	154 - 153	0.005	0.381	0.000	0.051	0.013	0.387 ✔	1.333	H1-3+VT ✔
	153 - 152	0.005	0.460	0.000	0.051	0.013	0.466 ✔	1.333	H1-3+VT ✔
	152 - 151	0.005	0.539	0.000	0.051	0.013	0.546 ✔	1.333	H1-3+VT ✔
	151 - 150	0.005	0.619	0.000	0.052	0.013	0.626 ✔	1.333	H1-3+VT ✔
L3	150 - 149	0.006	0.699	0.000	0.052	0.013	0.707 ✔	1.333	H1-3+VT ✔
	149 - 148	0.006	0.780	0.000	0.052	0.013	0.788 ✔	1.333	H1-3+VT ✔
L4	148 - 147	0.005	0.133	0.000	0.029	0.002	0.139 ✔	1.333	H1-3+VT ✔
	147 - 146	0.006	0.152	0.000	0.029	0.002	0.157 ✔	1.333	H1-3+VT ✔
	146 - 145	0.007	0.175	0.000	0.036	0.002	0.182 ✔	1.333	H1-3+VT ✔
	145 - 144	0.007	0.197	0.000	0.036	0.002	0.204 ✔	1.333	H1-3+VT ✔
	144 - 143	0.007	0.219	0.000	0.036	0.002	0.226 ✔	1.333	H1-3+VT ✔
L5	143 - 142	0.007	0.241	0.000	0.036	0.002	0.248 ✔	1.333	H1-3+VT ✔
	142 - 141	0.007	0.262	0.000	0.036	0.002	0.270 ✔	1.333	H1-3+VT ✔
	141 - 140	0.007	0.283	0.000	0.036	0.002	0.290 ✔	1.333	H1-3+VT ✔

tnxTower	Job: West Johnson Ave BU876313	Page: 42 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Project: 1466OA1400	Date: 15:14:35 06/04/14
	Client: Crown Castle	Designed by: Jeff Theberge

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
	140 - 139	0.007	0.304	0.000	0.036	0.002	0.311 ✔	1.333	H1-3+VT ✔
	139 - 138	0.007	0.326	0.000	0.038	0.002	0.333 ✔	1.333	H1-3+VT ✔
L6	138 - 137	0.009	0.364	0.000	0.065	0.002	0.375 ✔	1.333	H1-3+VT ✔
	137 - 136	0.009	0.402	0.000	0.065	0.001	0.412 ✔	1.333	H1-3+VT ✔
	136 - 135	0.009	0.439	0.000	0.064	0.001	0.449 ✔	1.333	H1-3+VT ✔
	135 - 134	0.009	0.475	0.000	0.064	0.001	0.485 ✔	1.333	H1-3+VT ✔
	134 - 133	0.009	0.510	0.000	0.064	0.001	0.521 ✔	1.333	H1-3+VT ✔
L7	133 - 132	0.010	0.545	0.000	0.064	0.001	0.555 ✔	1.333	H1-3+VT ✔
	132 - 131	0.010	0.578	0.000	0.064	0.001	0.589 ✔	1.333	H1-3+VT ✔
	131 - 130	0.010	0.611	0.000	0.064	0.001	0.622 ✔	1.333	H1-3+VT ✔
	130 - 129	0.010	0.644	0.000	0.064	0.001	0.654 ✔	1.333	H1-3+VT ✔
	129 - 128	0.010	0.675	0.000	0.064	0.001	0.686 ✔	1.333	H1-3+VT ✔
L8	128 - 127	0.010	0.706	0.000	0.064	0.001	0.717 ✔	1.333	H1-3+VT ✔
	127 - 126	0.012	0.749	0.000	0.076	0.001	0.763 ✔	1.333	H1-3+VT ✔
	126 - 125	0.012	0.787	0.000	0.076	0.001	0.800 ✔	1.333	H1-3+VT ✔
	125 - 124	0.012	0.823	0.000	0.076	0.001	0.837 ✔	1.333	H1-3+VT ✔
	124 - 123	0.012	0.859	0.000	0.076	0.001	0.872 ✔	1.333	H1-3+VT ✔
L9	123 - 122	0.012	0.894	0.000	0.075	0.001	0.907 ✔	1.333	H1-3+VT ✔
	122 - 121	0.012	0.928	0.000	0.075	0.001	0.942 ✔	1.333	H1-3+VT ✔
	121 - 120	0.012	0.962	0.000	0.075	0.001	0.975 ✔	1.333	H1-3+VT ✔
	120 - 119	0.012	0.994	0.000	0.075	0.001	1.008 ✔	1.333	H1-3+VT ✔
	119 - 118	0.014	1.033	0.000	0.079	0.001	1.049 ✔	1.333	H1-3+VT ✔
L10	118 - 116.917	0.014	1.070	0.000	0.079	0.001	1.086 ✔	1.333	H1-3+VT ✔
	116.917 - 115.833	0.014	1.106	0.000	0.079	0.001	1.122 ✔	1.333	H1-3+VT ✔
	115.833 - 114.75	0.014	1.141	0.000	0.078	0.001	1.157 ✔	1.333	H1-3+VT ✔
	114.75 - 111	0.007	0.577	0.000	0.036	0.000	0.584 ✔	1.333	H1-3+VT ✔

tnxTower	Job: West Johnson Ave BU876313	Page: 43 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Project: 1466OA1400	Date: 15:14:35 06/04/14
	Client: Crown Castle	Designed by: Jeff Theberge

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
L11	114.75 - 111	0.007	0.567	0.000	0.034	0.000	0.574 ✔	1.333	H1-3+VT ✔
	111 - 109.75	0.012	1.079	0.000	0.063	0.001	1.092 ✔	1.333	H1-3+VT ✔
L12	109.75 - 108.625	0.012	1.105	0.000	0.063	0.001	1.119 ✔	1.333	H1-3+VT ✔
	108.625 - 107.5	0.012	1.131	0.000	0.063	0.001	1.145 ✔	1.333	H1-3+VT ✔
	107.5 - 106.375	0.013	1.157	0.000	0.063	0.000	1.170 ✔	1.333	H1-3+VT ✔
	106.375 - 105.25	0.013	1.182	0.000	0.063	0.000	1.195 ✔	1.333	H1-3+VT ✔
L13	105.25 - 104.25	0.009	0.826	0.000	0.043	0.000	0.835 ✔	1.333	H1-3+VT ✔
	104.25 - 103.25	0.009	0.840	0.000	0.043	0.000	0.849 ✔	1.333	H1-3+VT ✔
	103.25 - 102.25	0.009	0.854	0.000	0.042	0.000	0.864 ✔	1.333	H1-3+VT ✔
	102.25 - 101.25	0.009	0.868	0.000	0.042	0.000	0.878 ✔	1.333	H1-3+VT ✔
	101.25 - 100.25	0.009	0.882	0.000	0.042	0.000	0.891 ✔	1.333	H1-3+VT ✔
L14	100.25 - 99.25	0.009	0.905	0.000	0.043	0.000	0.914 ✔	1.333	H1-3+VT ✔
	99.25 - 98.25	0.009	0.918	0.000	0.043	0.000	0.928 ✔	1.333	H1-3+VT ✔
	98.25 - 97.25	0.010	0.931	0.000	0.043	0.000	0.941 ✔	1.333	H1-3+VT ✔
	97.25 - 96.25	0.010	0.944	0.000	0.042	0.000	0.954 ✔	1.333	H1-3+VT ✔
	96.25 - 95.25	0.010	0.956	0.000	0.042	0.000	0.966 ✔	1.333	H1-3+VT ✔
L15	95.25 - 94.25	0.010	0.979	0.000	0.043	0.000	0.989 ✔	1.333	H1-3+VT ✔
	94.25 - 93.25	0.010	0.991	0.000	0.043	0.000	1.001 ✔	1.333	H1-3+VT ✔
	93.25 - 92.25	0.010	1.003	0.000	0.043	0.000	1.013 ✔	1.333	H1-3+VT ✔
	92.25 - 91.25	0.010	1.015	0.000	0.043	0.000	1.025 ✔	1.333	H1-3+VT ✔
	91.25 - 90.25	0.010	1.026	0.000	0.042	0.000	1.037 ✔	1.333	H1-3+VT ✔
L16	90.25 - 89.25	0.011	1.049	0.000	0.043	0.000	1.060 ✔	1.333	H1-3+VT ✔
	89.25 - 88.25	0.011	1.060	0.000	0.043	0.000	1.071 ✔	1.333	H1-3+VT ✔
	88.25 - 87.25	0.011	1.071	0.000	0.043	0.000	1.082 ✔	1.333	H1-3+VT ✔
	87.25 - 86.25	0.011	1.082	0.000	0.043	0.000	1.093 ✔	1.333	H1-3+VT ✔
	86.25 - 85.25	0.011	1.092	0.000	0.043	0.000	1.104 ✔	1.333	H1-3+VT ✔

tnxTower	Job: West Johnson Ave BU876313	Page: 44 of 47
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Project: 1466OA1400	Date: 15:14:35 06/04/14
	Client: Crown Castle	Designed by: Jeff Theberge

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
L17	85.25 - 84.1875	0.011	1.115	0.000	0.043	0.000	1.127 ✔	1.333	H1-3+VT ✔
	84.1875 - 83.125	0.011	1.126	0.000	0.043	0.000	1.138 ✔	1.333	H1-3+VT ✔
	83.125 - 82.0625	0.011	1.137	0.000	0.043	0.000	1.149 ✔	1.333	H1-3+VT ✔
	82.0625 - 81	0.011	1.147	0.000	0.043	0.000	1.159 ✔	1.333	H1-3+VT ✔
	81 - 76.75	0.007	0.658	0.000	0.024	0.000	0.664 ✔	1.333	H1-3+VT ✔
L18	81 - 76.75	0.006	0.596	0.000	0.021	0.000	0.602 ✔	1.333	H1-3+VT ✔
	76.75 - 75.75	0.013	1.345	0.000	0.047	0.000	1.359 ✘	1.333	H1-3+VT ✘
L19	75.75 - 74.75	0.014	1.355	0.000	0.047	0.000	1.369 ✘	1.333	H1-3+VT ✘
	74.75 - 73.75	0.014	1.364	0.000	0.047	0.000	1.378 ✘	1.333	H1-3+VT ✘
	73.75 - 72.75	0.014	1.374	0.000	0.047	0.000	1.388 ✘	1.333	H1-3+VT ✘
	72.75 - 71.75	0.014	1.383	0.000	0.047	0.000	1.397 ✘	1.333	H1-3+VT ✘
	71.75 - 70.75	0.014	1.392	0.000	0.046	0.000	1.406 ✘	1.333	H1-3+VT ✘
L20	70.75 - 69.75	0.010	0.970	0.000	0.032	0.000	0.980 ✔	1.333	H1-3+VT ✔
	69.75 - 68.75	0.010	0.976	0.000	0.032	0.000	0.986 ✔	1.333	H1-3+VT ✔
	68.75 - 67.75	0.010	0.981	0.000	0.032	0.000	0.991 ✔	1.333	H1-3+VT ✔
	67.75 - 66.75	0.010	0.987	0.000	0.032	0.000	0.997 ✔	1.333	H1-3+VT ✔
	66.75 - 65.75	0.010	0.993	0.000	0.032	0.000	1.003 ✔	1.333	H1-3+VT ✔
L21	65.75 - 64.75	0.010	1.007	0.000	0.032	0.000	1.017 ✔	1.333	H1-3+VT ✔
	64.75 - 63.75	0.010	1.012	0.000	0.032	0.000	1.023 ✔	1.333	H1-3+VT ✔
	63.75 - 62.75	0.010	1.018	0.000	0.032	0.000	1.028 ✔	1.333	H1-3+VT ✔
	62.75 - 61.75	0.010	1.023	0.000	0.032	0.000	1.033 ✔	1.333	H1-3+VT ✔
	61.75 - 60.75	0.010	1.028	0.000	0.032	0.000	1.039 ✔	1.333	H1-3+VT ✔
L22	60.75 - 59.75	0.011	1.042	0.000	0.032	0.000	1.053 ✔	1.333	H1-3+VT ✔
	59.75 - 58.75	0.011	1.047	0.000	0.032	0.000	1.058 ✔	1.333	H1-3+VT ✔
	58.75 - 57.75	0.011	1.052	0.000	0.032	0.000	1.063 ✔	1.333	H1-3+VT ✔
	57.75 - 56.75	0.011	1.057	0.000	0.032	0.000	1.068 ✔	1.333	H1-3+VT ✔
	56.75 - 55.75	0.011	1.061	0.000	0.032	0.000	1.073 ✔	1.333	H1-3+VT ✔
L23	55.75 - 54.75	0.011	1.076	0.000	0.032	0.000	1.087 ✔	1.333	H1-3+VT ✔
	54.75 - 53.75	0.011	1.080	0.000	0.032	0.000	1.092 ✔	1.333	H1-3+VT ✔

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
	53.75 - 52.75	0.011	1.085	0.000	0.032	0.000	1.096 ✔	1.333	H1-3+VT ✔
	52.75 - 51.75	0.011	1.089	0.000	0.032	0.000	1.101 ✔	1.333	H1-3+VT ✔
	51.75 - 50.75	0.011	1.093	0.000	0.032	0.000	1.105 ✔	1.333	H1-3+VT ✔
L24	50.75 - 49.375	0.012	1.099	0.000	0.031	0.000	1.111 ✔	1.333	H1-3+VT ✔
	49.375 - 48	0.012	1.105	0.000	0.031	0.000	1.117 ✔	1.333	H1-3+VT ✔
	48 - 43	0.006	0.520	0.000	0.015	0.000	0.526 ✔	1.333	H1-3+VT ✔
L25	48 - 43	0.006	0.509	0.000	0.014	0.000	0.515 ✔	1.333	H1-3+VT ✔
	43 - 42	0.011	0.950	0.000	0.026	0.000	0.961 ✔	1.333	H1-3+VT ✔
L26	42 - 41	0.011	0.960	0.000	0.026	0.000	0.971 ✔	1.333	H1-3+VT ✔
	41 - 40	0.011	0.963	0.000	0.026	0.000	0.974 ✔	1.333	H1-3+VT ✔
	40 - 39	0.011	0.965	0.000	0.026	0.000	0.976 ✔	1.333	H1-3+VT ✔
	39 - 38	0.011	0.968	0.000	0.026	0.000	0.979 ✔	1.333	H1-3+VT ✔
	38 - 37	0.011	0.971	0.000	0.025	0.000	0.982 ✔	1.333	H1-3+VT ✔
L27	37 - 36	0.011	0.980	0.000	0.026	0.000	0.992 ✔	1.333	H1-3+VT ✔
	36 - 35	0.011	0.983	0.000	0.026	0.000	0.994 ✔	1.333	H1-3+VT ✔
	35 - 34	0.011	0.985	0.000	0.025	0.000	0.997 ✔	1.333	H1-3+VT ✔
	34 - 33	0.011	0.988	0.000	0.025	0.000	0.999 ✔	1.333	H1-3+VT ✔
	33 - 32	0.012	0.990	0.000	0.025	0.000	1.002 ✔	1.333	H1-3+VT ✔
L28	32 - 30.75	0.012	1.000	0.000	0.025	0.000	1.012 ✔	1.333	H1-3+VT ✔
	30.75 - 29.5	0.012	1.003	0.000	0.025	0.000	1.015 ✔	1.333	H1-3+VT ✔
	29.5 - 28.25	0.012	1.006	0.000	0.025	0.000	1.018 ✔	1.333	H1-3+VT ✔
L29	28.25 - 28.08 (29)	0.010	0.832	0.000	0.021	0.000	0.842 ✔	1.333	H1-3+VT ✔
L30	28.08 - 27.25 (30)	0.009	0.754	0.000	0.019	0.000	0.763 ✔	1.333	H1-3+VT ✔
L31	27.25 - 26.25	0.012	0.995	0.000	0.025	0.000	1.008 ✔	1.333	H1-3+VT ✔
	26.25 - 25.25	0.012	0.997	0.000	0.025	0.000	1.010 ✔	1.333	H1-3+VT ✔
	25.25 - 24.25	0.012	0.999	0.000	0.025	0.000	1.012 ✔	1.333	H1-3+VT ✔

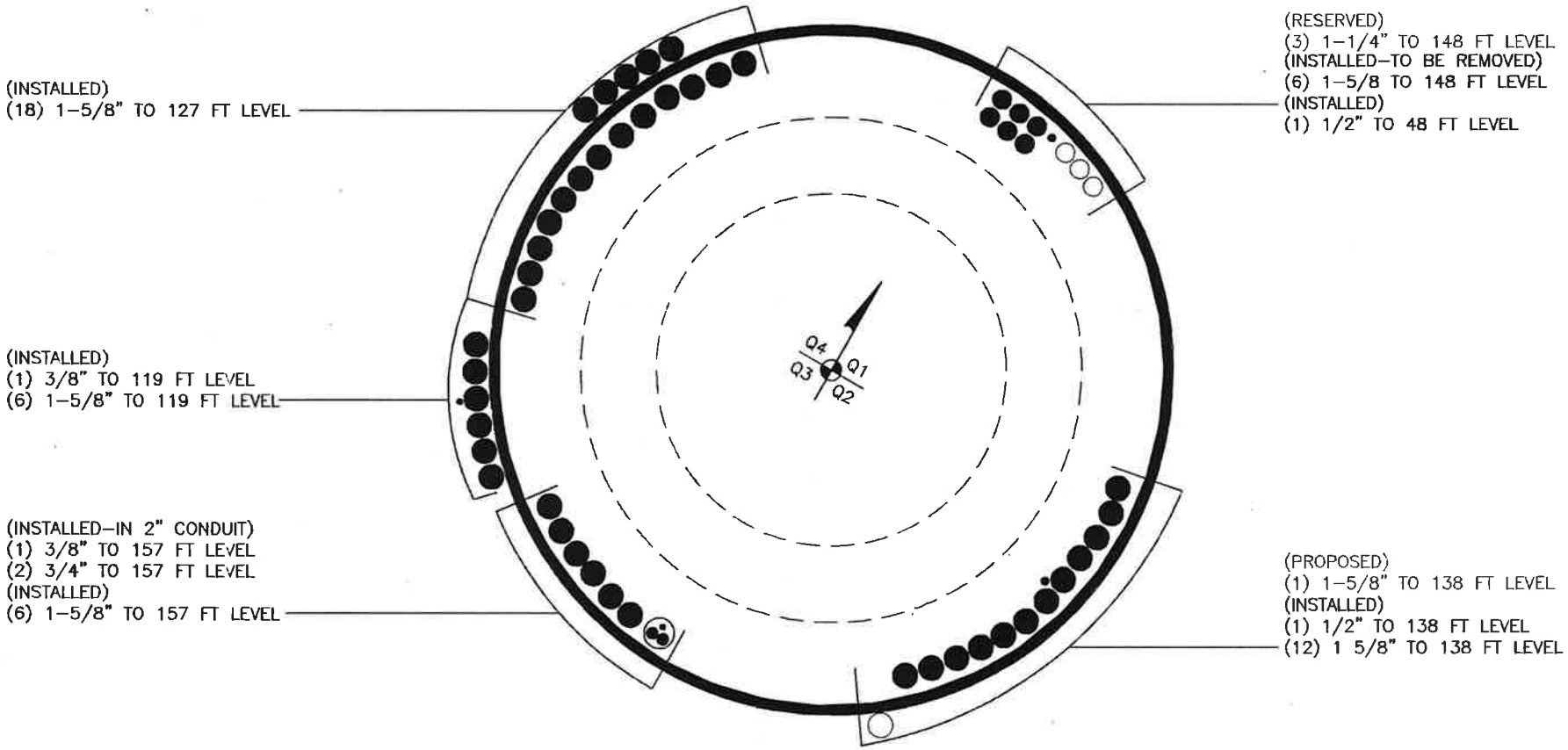
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	24.25 - 23.25	0.012	1.001	0.000	0.025	0.000	1.014 ✔	1.333	H1-3+VT ✔
	23.25 - 22.25	0.012	1.003	0.000	0.025	0.000	1.016 ✔	1.333	H1-3+VT ✔
L32	22.25 - 21.25	0.013	1.020	0.000	0.025	0.000	1.032 ✔	1.333	H1-3+VT ✔
	21.25 - 20.25	0.013	1.021	0.000	0.025	0.000	1.034 ✔	1.333	H1-3+VT ✔
	20.25 - 19.25	0.013	1.023	0.000	0.025	0.000	1.036 ✔	1.333	H1-3+VT ✔
	19.25 - 18.25	0.013	1.025	0.000	0.025	0.000	1.038 ✔	1.333	H1-3+VT ✔
	18.25 - 17.25	0.013	1.026	0.000	0.025	0.000	1.040 ✔	1.333	H1-3+VT ✔
L33	17.25 - 16 (33)	0.013	1.028	0.000	0.025	0.000	1.042 ✔	1.333	H1-3+VT ✔
L34	16 - 14.58 (34)	0.011	0.847	0.000	0.020	0.000	0.858 ✔	1.333	H1-3+VT ✔
L35	14.58 - 13.415	0.012	0.950	0.000	0.023	0.000	0.962 ✔	1.333	H1-3+VT ✔
	13.415 - 12.25	0.012	0.951	0.000	0.022	0.000	0.964 ✔	1.333	H1-3+VT ✔
L36	12.25 - 11.125	0.011	0.836	0.000	0.020	0.000	0.848 ✔	1.333	H1-3+VT ✔
	11.125 - 10	0.011	0.838	0.000	0.020	0.000	0.849 ✔	1.333	H1-3+VT ✔
L37	10 - 9	0.013	0.943	0.000	0.022	0.000	0.955 ✔	1.333	H1-3+VT ✔
	9 - 8	0.013	0.944	0.000	0.022	0.000	0.957 ✔	1.333	H1-3+VT ✔
	8 - 7	0.013	0.945	0.000	0.022	0.000	0.958 ✔	1.333	H1-3+VT ✔
	7 - 6	0.013	0.946	0.000	0.022	0.000	0.959 ✔	1.333	H1-3+VT ✔
	6 - 5	0.013	0.947	0.000	0.022	0.000	0.960 ✔	1.333	H1-3+VT ✔
L38	5 - 4	0.013	0.955	0.000	0.022	0.000	0.968 ✔	1.333	H1-3+VT ✔
	4 - 3	0.013	0.956	0.000	0.022	0.000	0.969 ✔	1.333	H1-3+VT ✔
	3 - 2	0.013	0.957	0.000	0.022	0.000	0.970 ✔	1.333	H1-3+VT ✔
	2 - 1	0.013	0.958	0.000	0.022	0.000	0.971 ✔	1.333	H1-3+VT ✔
	1 - 0	0.013	0.959	0.000	0.022	0.000	0.972 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP10x10x0.322	Pole	12.9%	Pass
155 - 150	Pole	TP10x10x0.322	Pole	34.9%	Pass
150 - 148	Pole	TP10x10x0.322	Pole	44.0%	Pass
148 - 143	Pole	TP23.81x23x0.25	Pole	11.9%	Pass
143 - 138	Pole	TP24.62x23.81x0.25	Pole	17.5%	Pass
138 - 133	Pole	TP25.43x24.62x0.25	Pole	27.3%	Pass
133 - 128	Pole	TP26.24x25.43x0.25	Pole	36.0%	Pass
128 - 123	Pole	TP27.05x26.24x0.25	Pole	46.2%	Pass
123 - 118	Pole	TP27.86x27.05x0.25	Pole	55.9%	Pass
118 - 114.75	Pole	TP28.994x27.86x0.25	Pole	62.0%	Pass
114.75 - 109.75	Pole	TP28.696x27.887x0.3125	Pole	57.3%	Pass
109.75 - 105.25	Pole	TP29.425x28.696x0.3125	Pole	62.7%	Pass
105.25 - 100.25	Pole + Reinf.	TP30.235x29.425x0.4625	Reinf. 5 Tension Rupture	65.1%	Pass
100.25 - 95.25	Pole + Reinf.	TP31.045x30.235x0.4575	Reinf. 5 Tension Rupture	70.5%	Pass
95.25 - 90.25	Pole + Reinf.	TP31.855x31.045x0.4525	Reinf. 5 Tension Rupture	75.4%	Pass
90.25 - 85.25	Pole + Reinf.	TP32.665x31.855x0.4475	Reinf. 5 Tension Rupture	80.1%	Pass
85.25 - 81	Pole + Reinf.	TP34.042x32.665x0.4425	Reinf. 5 Tension Rupture	83.7%	Pass
81 - 75.75	Pole	TP33.579x32.729x0.375	Pole	71.3%	Pass
75.75 - 70.75	Pole	TP34.389x33.579x0.375	Pole	73.8%	Pass
70.75 - 65.75	Pole + Reinf.	TP35.199x34.389x0.55	Reinf. 4 Tension Rupture	78.3%	Pass
65.75 - 60.75	Pole + Reinf.	TP36.009x35.199x0.545	Reinf. 4 Tension Rupture	81.0%	Pass
60.75 - 55.75	Pole + Reinf.	TP36.819x36.009x0.54	Reinf. 4 Tension Rupture	83.5%	Pass
55.75 - 50.75	Pole + Reinf.	TP37.629x36.819x0.535	Reinf. 4 Tension Rupture	85.8%	Pass
50.75 - 48	Pole + Reinf.	TP38.884x37.629x0.535	Reinf. 4 Tension Rupture	87.0%	Pass
48 - 42	Pole + Reinf.	TP38.296x37.324x0.6675	Reinf. 6 Tension Rupture	78.2%	Pass
42 - 37	Pole + Reinf.	TP39.106x38.296x0.6625	Reinf. 6 Tension Rupture	79.9%	Pass
37 - 32	Pole + Reinf.	TP39.916x39.106x0.6575	Reinf. 6 Tension Rupture	81.5%	Pass
32 - 28.25	Pole + Reinf.	TP40.524x39.916x0.6525	Reinf. 6 Tension Rupture	82.6%	Pass
28.25 - 28.08	Pole + Reinf.	TP40.551x40.524x0.7975	Reinf. 6 Tension Rupture	69.7%	Pass
28.08 - 27.25	Pole + Reinf.	TP40.686x40.551x0.8875	Reinf. 6 Tension Rupture	61.8%	Pass
27.25 - 22.25	Pole + Reinf.	TP41.496x40.686x0.6625	Reinf. 2 Tension Rupture	77.7%	Pass
22.25 - 17.25	Pole + Reinf.	TP42.306x41.496x0.6525	Reinf. 2 Tension Rupture	78.9%	Pass
17.25 - 16	Pole + Reinf.	TP42.508x42.306x0.6525	Reinf. 2 Tension Rupture	79.2%	Pass
16 - 14.58	Pole + Reinf.	TP42.738x42.508x0.8025	Reinf. 7 Tension Rupture	70.2%	Pass
14.58 - 12.25	Pole + Reinf.	TP43.116x42.738x0.7125	Reinf. 7 Tension Rupture	80.6%	Pass
12.25 - 10	Pole + Reinf.	TP43.48x43.116x0.8175	Reinf. 7 Tension Rupture	72.2%	Pass
10 - 5	Pole + Reinf.	TP44.29x43.48x0.7225	Reinf. 2 Tension Rupture	74.3%	Pass
5 - 0	Pole + Reinf.	TP45.1x44.29x0.7175	Reinf. 2 Tension Rupture	75.3%	Pass
				Summary	
			Pole	75.5%	Pass
			Reinforcement	87.0%	Pass
			Overall	87.0%	Pass

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(18) 1-5/8" TO 127 FT LEVEL
(INSTALLED)
(1) 3/8" TO 119 FT LEVEL
(6) 1-5/8" TO 119 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(1) 3/8" TO 157 FT LEVEL
(2) 3/4" TO 157 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 157 FT LEVEL
(RESERVED)
(3) 1-1/4" TO 148 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8 TO 148 FT LEVEL
(INSTALLED)
(1) 1/2" TO 48 FT LEVEL
(PROPOSED)
(1) 1-5/8" TO 138 FT LEVEL
(INSTALLED)
(1) 1/2" TO 138 FT LEVEL
(12) 1 5/8" TO 138 FT LEVEL
Q4
Q1
Q3
Q2

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 876313

Work Order: _____

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	160	12	0	0	10	10	0.322	n/a	A53-B-35
2	148	37	3.75	18	23.00	28.994	0.25	1	A572-60
3	114.75	38	4.25	18	27.89	34.042	0.3125	1.25	A572-60
4	81	38	5	18	32.73	38.884	0.375	1.5	A572-65
5	48	48	0	18	37.32	45.1	0.4375	1.75	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	12.25	channel	MP3-06 (1.1875")	2							E				E							
2	0	28.25	channel	MP3-06 (1.1875")	2			E												E			
3	14.58	28.08	channel	MP3-06 (1.1875")	1									E									
4	45.25	70.75	channel	MP3-05 (1.1875")	3			E						E						E			
5	78.25	105.25	channel	MP3-04 (1.1875")	3			E						E						E			
6	27.25	46.75	plate	CCI-SFP-065125	3						E						E						E
7	10	16	plate	CCI-SFP-060100	3						P						P						P
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	I_x (in^4)	I_y (in^4)	L_u (in)	Connection Length (in)	Bolt Hole Size (in)	Reinforcement Material
1	6.89	2.61	8.47	0.93	4.950	52.500	24.000	24.000	1.1875	A572-65
2	6.89	2.61	8.47	0.93	4.950	52.500	24.000	24.000	1.1875	A572-65
3	6.89	2.61	8.47	0.93	4.950	52.500	24.000	24.000	1.1875	A572-65
4	5.33	2.09	5.65	0.79	2.150	20.790	18.000	18.000	1.1875	A572-65
5	4.78	1.61	4.13	0.61	0.910	11.860	18.000	18.000	1.1875	A572-65
6	6.5	1.25	8.125	0.625	1.058	28.607	19.000	n/a	1.1875	A572-65
7	6	1	6	0.5	0.500	18.000	16.000	n/a	1.1875	A572-65

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity							
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7
160 - 155	115	n/a	115	9.79	n/a	9.79	12.9%							
155 - 150	115	n/a	115	9.79	n/a	9.79	34.9%							
150 - 148	115	n/a	115	9.79	n/a	9.79	44.0%							
148 - 143	1311	n/a	1311	18.69	n/a	18.69	11.9%							
143 - 138	1450	n/a	1450	19.34	n/a	19.34	17.5%							
138 - 133	1600	n/a	1600	19.98	n/a	19.98	27.3%							
133 - 128	1759	n/a	1759	20.62	n/a	20.62	36.0%							
128 - 123	1929	n/a	1929	21.27	n/a	21.27	46.2%							
123 - 118	2109	n/a	2109	21.91	n/a	21.91	55.9%							
118 - 114.75	2232	n/a	2232	22.33	n/a	22.33	62.0%							
114.75 - 109.75	2865	n/a	2865	28.15	n/a	28.15	57.3%							
109.75 - 105.25	3091	n/a	3091	28.88	n/a	28.88	62.7%							
105.25 - 100.25	3356	1539	4895	29.68	12.39	42.07	58.5%					65.1%		
100.25 - 95.25	3636	1619	5255	30.48	12.39	42.87	63.4%					70.5%		
95.25 - 90.25	3931	1701	5632	31.29	12.39	43.68	67.9%					75.4%		
90.25 - 85.25	4242	1785	6027	32.09	12.39	44.48	72.1%					80.1%		
85.25 - 81	4519	1858	6377	32.77	12.39	45.16	75.5%					83.7%		
81 - 75.75	5503	n/a	5503	39.52	n/a	39.52	71.3%							
75.75 - 70.75	5916	n/a	5916	40.48	n/a	40.48	73.8%							
70.75 - 65.75	6348	2877	9225	41.45	16.95	58.40	65.5%				78.3%			
65.75 - 60.75	6802	3004	9806	42.41	16.95	59.36	67.8%				81.0%			
60.75 - 55.75	7276	3135	10411	43.38	16.95	60.33	70.0%				83.5%			
55.75 - 50.75	7772	3268	11040	44.34	16.95	61.29	72.0%				85.8%			
50.75 - 48	8054	3342	11397	44.87	16.95	61.82	73.0%				87.0%			
48 - 42	9516	4809	14326	52.57	24.38	76.94	62.9%						78.2%	
42 - 37	10140	5007	15147	53.69	24.38	78.07	64.3%						79.9%	
37 - 32	10791	5208	15999	54.82	24.38	79.19	65.6%						81.5%	
32 - 28.25	11297	5361	16658	55.66	24.38	80.04	66.6%						82.6%	
28.25 - 28.08	11419	8857	20276	55.70	41.32	97.02	58.9%		58.4%				69.7%	
28.08 - 27.25	11434	11178	22612	55.89	49.79	105.67	49.8%		58.2%	35.6%			61.8%	
27.25 - 22.25	12139	5996	18135	57.01	25.41	82.42	66.5%		77.7%	47.3%				
22.25 - 17.25	12871	6221	19092	58.14	25.41	83.55	67.6%		78.9%	47.8%				
17.25 - 16	13059	6278	19337	58.42	25.41	83.83	67.9%		79.2%	47.9%				
16 - 14.58	13274	10675	23949	58.74	43.41	102.15	55.9%		65.2%	39.4%				70.2%
14.58 - 12.25	13758	8308	22066	59.26	34.94	94.20	67.3%		65.8%					80.6%
12.25 - 10	14035	11659	25694	59.77	51.88	111.65	57.5%	50.8%	41.0%					72.2%
10 - 5	14819	9285	24103	60.89	33.88	94.77	65.6%	69.6%	74.3%					
5 - 0	15654	9613	25267	62.02	33.88	95.90	66.5%	70.5%	75.3%					

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Project No.
Site Name:
Site No.

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	52	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	53	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
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:	45.1	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3421	ft-kips
Unfactored Axial, P:	53	kips
Unfactored Shear, V:	29	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	194.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	99.5% Pass

Base Plate Results	Flexural Check
Base Plate Stress:	45.2 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	90.4% Pass

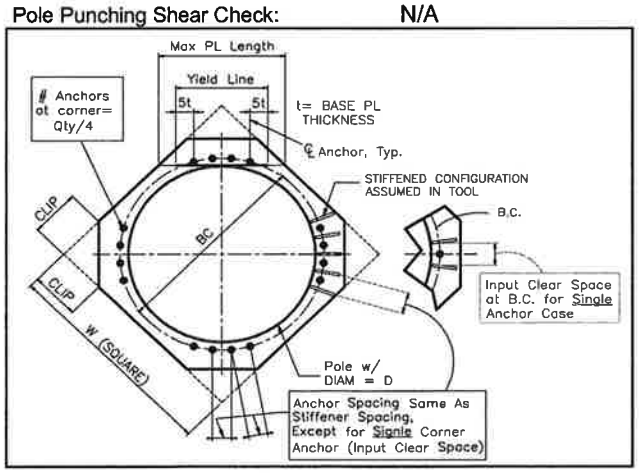
PL Ref. Data
Yield Line (in): 29.85
Max PL Length: 29.85

N/A - Unstiffened
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



** 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#: *876313*
Site Name: *West Johnson Ave*
App #:

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:	0	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	6.5	ft
Pad Thickness, T:	6.5	ft
Pad Width=Length, L:	11	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	38.48	ft^2
Pier Height:	0.50	ft
Soil (above pad) Height:	0.00	ft

Soil Parameters		
Unit Weight, γ:	115.0	pcf
Ultimate Bearing Capacity, qn:	6.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	0.0	degrees
Undrained Shear Strength, Cu:	0.75	ksf
Allowable Bearing: ϕ*qn:	4.50	ksf
Passive Pres. Coeff., Kp	1.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	0.0	kips
Pad Force Location Above D:	3.03	ft
ϕ(Passive Pressure Moment):	0.00	ft-kips
Factored O.T. M(WL), "1.6W":	467.1	ft-kips
Factored OT (MW-Msoil), M1	467.10	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	120.9	kips
Unfactored (Total ftg-soil Wt):	120.86	kips
1.2D. **No Soil Wedges.**	145.03	kips
0.9D. **With Soil Wedges**	108.78	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:	0	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	0	kips
Unfactored WL Moment, M:	346	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	0	kips
0.90	0.9D+1.6W, Pu:	0	kips
1.35	Vu:	0	kips
	Mu:	467.1	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	145.03	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	467.10	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	3.22	ft
Orthogonal qu=	2.89	ksf
qu/ϕ*qn Ratio=	**64.27%**	Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	2.28	ft
Diagonal qu=	3.49	ksf
qu/ϕ*qn Ratio=	**77.57%**	Pass

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	108.78	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	467.10	ft-kips

Orthogonal ecc3 = M2/P2 =	4.29	ft
Ortho Non Bearing Length,NBL=	8.59	ft
Orthogonal qu=	4.10	ksf
Diagonal qu=	4.48	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	346.00		
M Orthogonal:	354.63	**97.57%**	Pass
M Diagonal:	346.60	**99.83%**	Pass

CAISSON Version 10.61 1:14:57 PM Thursday, June 05, 2014
FDH Engineering

* CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2010 *

Project Title:
Project Notes:

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	0.50	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	2.00	0.00	110.0			
2	Sand	3.00	2.00	120.0		3.392	33.00
3	Sand	32.00	5.00	115.0		2.464	25.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
3075.0	53.0	29.00	2.70 : Soil Capacity = 2.00/2.70 = 74.1%

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
26.000	150.090	1377.2	3900.0	5277.2

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	2.00	110.0			0.00	1.50
Sand	2.50	3.00	120.0		3.392	85.48	4.22
Sand	5.50	13.33	115.0		2.464	929.25	13.43
Sand	18.83	7.17	115.0		2.464	-936.35	22.61

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)	
0.00	78.4	8329.4	29.0	3085.0	
2.60	76.8	8533.1	28.4	3160.4	
5.20	4.9	8651.8	1.8	3204.4	max
7.80	-91.9	8543.8	-34.0	3164.4	
10.40	-225.6	8139.8	-83.6	3014.7	
13.00	-399.5	7335.8	-148.0	2717.0	
15.60	-613.7	6027.3	-227.3	2232.3	
18.20	-868.1	4109.6	-321.5	1522.1	
20.80	-709.9	1915.6	-262.9	709.5	
23.40	-375.1	496.3	-138.9	183.8	
26.00	0.0	0.0	0.0	0.0	

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#:
Site Name:
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	20	
As Total=	31.2	in^2
A s/ Aconc, Rho:	0.0056	0.56%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.56%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8280.46	kips
at Mu=(ϕ=0.65)Mn=	5016.69	ft-kips
Max Tu, (φ=0.9) Tn =	1684.8	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	3204.4	ft-kips **(* Note)**
Max. Service Shaft P:	53	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.30	Mu:	4165.72	ft-kips
1.30	Pu:	68.9	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

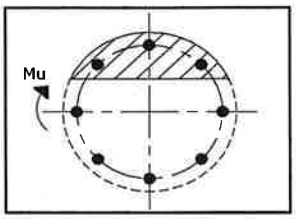
Seismic Properties

Seismic Design Category = C
Seismic Risk = **Moderate**

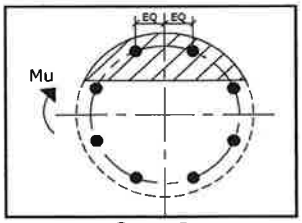
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **1**



Case 1



Case 2

Dist. From Edge to Neutral Axis: **13.77** in
Extreme Steel Strain, εt: **0.0141**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	68.90	kips
Drilled Shaft Moment Capacity, φMn:	**4994.79**	ft-kips
Drilled Shaft Superimposed Mu:	**4165.72**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**83.4%**

APPENDIX D

MODIFICATION DRAWINGS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD, PROJECT NO. 37513-0755 R2 DATED JANUARY 13, 2014.

FOR PASSING STRUCTURAL ANALYSIS WITH MODIFICATIONS IN PLACE SEE FDH ENGINEERING, INC., (PROJECT NO. 1466OA1400), CROWN SDD WO# 767328 FOR VERIZON APPLICATION 210679 REV. 5 DATED JUNE 05, 2014.

ALL DIMENSIONS, MEASUREMENTS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO MATERIAL ORDERS AND CONSTRUCTION.

THIS MODIFICATION DESIGN HAS BEEN PERFORMED IN ACCORDANCE WITH THE ANSI / TIA-222-F "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES & ANTENNAS"

TOWER MANUFACTURER : SUMMIT MANUFACTURING
JOB# 3899

PROJECT CONTACTS:

CROWN CASTLE TSA
STEVE TUTTLE
STEVE.TUTTLE@CROWNCASTLE.COM
(585) 899-3445

FDH PROJECT ENGINEER
JEFF THEBERGE
JTHEBERGE@FDH-INC.COM
(919) 755-1012

FDH ENGINEER (EOR)
BRADLEY R. NEWMAN, P.E.
BRADLEY@FDH-INC.COM
(919) 755-1012

PROJECT DESCRIPTION:

MODIFICATION DRAWINGS FOR A 160' MONOPOLE

CROWN CASTLE

SITE NAME:

WEST JOHNSON AVE. BURNT HOUSE

SITE NUMBER:

876313

SITE ADDRESS:
1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489

COORDINATES:
LATITUDE: 41.5643°
LONGITUDE: -72.8919°

SHEET INDEX

SHT. NO.	DESCRIPTION
S-1	TITLE SHEET
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	GENERAL NOTES
S-4	MODIFICATION SCHEDULE & FLAT PLATE INSTALLATION DETAILS

PREPARED BY:
FDH ENGINEERING INNOVATION
6521 MERIDEN DRIVE
RALEIGH, NC 27616
PHONE: 919-755-1012
FAX: 919-755-1031

PREPARED FOR:
CROWN CASTLE

STATE OF CONNECTICUT
BRADLEY R. NEWMAN
29630
LICENSED PROFESSIONAL ENGINEER
06/05/14
BRADLEY R. NEWMAN, P.E.
CONNECTICUT LIC. NO. 29630

DRAWN BY:	KM
CHECKED BY:	JJT
ENG APPV'D:	BRN
PROJECT NO:	1466OA1400

SUBMITTALS

DATE	DESCRIPTION	REV
06/05/13	CONSTRUCTION	0

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. REPRODUCTION OR CAUSING TO BE REPRODUCED THE WHOLE OR ANY PART OF THESE DRAWINGS WITHOUT THE PERMISSION OF FDH ENGINEERING, INC. IS PROHIBITED.

SITE NAME:
WEST JOHNSON AVE.
BURNT HOUSE

SITE NUMBER:
876313

SITE ADDRESS:
1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489

SHEET TITLE
TITLE SHEET

SHEET NUMBER
S-1

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
N/A	EOR APPROVED SHOP DRAWINGS
N/A	FABRICATION INSPECTION
N/A	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
N/A	FABRICATOR NDE INSPECTION
N/A	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS
N/A	POST INSTALLED ANCHOR ROD VERIFICATION
N/A	BASE PLATE GROUT VERIFICATION
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO ENG-SOW-10007.

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CROWN CASTLE

STATE OF CONNECTICUT
BRADLEY R. NEWMAN
29630
LICENSED
PROFESSIONAL ENGINEER

06/05/14

BRADLEY R. NEWMAN, P.E.
CONNECTICUT LIC. NO. 29630

DRAWN BY:	KM
CHECKED BY:	JJT
ENG APPV'D:	BRN
PROJECT NO:	14660A1400

SUBMITTALS

DATE	DESCRIPTION	REV
06/05/13	CONSTRUCTION	0

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WEST JOHNSON AVE.
BURNT HOUSE

SITE NUMBER:
876313

SITE ADDRESS:
1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489

SHEET TITLE
MODIFICATION
INSPECTION CHECKLIST

SHEET NUMBER
S-2

GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL PERMITS NECESSARY TO COMPLETE THE PROJECT AND ABIDE BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO FDH ENGINEERING FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
3. INCORRECTLY FABRICATED, DAMAGED, OTHERWISE MISFITTING, OR NON-CONFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO FDH ENGINEERING PRIOR TO ANY REMEDIAL OR CORRECTIVE ACTION. ALL ACTIONS SHALL REQUIRE FDH ENGINEERING APPROVAL.
4. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AFTER THE COMPLETION OF THE PROJECT.
5. CONTRACTOR SHALL PROMPTLY REMOVE ANY & ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRECONSTRUCTION CONDITION.
6. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE CROWN ENGINEERING GROUP (OR ENGINEER OF RECORD)

CONTRACTOR QUALIFICATION NOTES:

1. ALL REPAIRS SHALL BE PERFORMED BY A TOWER CONTRACTOR WITH A MINIMUM 5 YEARS EXPERIENCE IN TOWER ERECTION AND RETROFIT AND WITH WORKING KNOWLEDGE OF THE TIA/EIA 222-F "STRUCTURAL STANDARD FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
2. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS. SHOULD THE CONTRACTOR REQUIRE DIRECT CONSULTATION, FDH ENGINEERING, INC. IS WILLING TO OFFER SERVICES BASED UPON AN AGREED FEE FOR THE WORK REQUIRED.
3. ALL SUBMITTAL INFORMATION MUST BE SENT TO FDH ENGINEERING, INC. 6521 MERIDIEN DRIVE, RALEIGH NC, 27616, TEL. (919) 755-1012, FAX. (919) 755-1031, E-MAIL INFO@FDH-INC.COM. ANY VARIATION OF THESE SPECIFICATIONS OR DRAWINGS WITHOUT CONSENT FROM FDH ENGINEERING, INC. WILL VOID ANY RESPONSIBILITY OR LIABILITY FOR DAMAGE (MATERIAL OR PHYSICAL) TOWARDS FDH ENGINEERING, INC.
4. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE TIA-1019-A STANDARD.

JOB SITE SAFETY & NOTES:

1. NEITHER THE PROFESSIONAL ACTIVITIES OF FDH ENGINEERING, INC. NOR THE PRESENCE OF FDH ENGINEERING, INC. OR EMPLOYEES AND SUB-CONSULTANTS AT THE CONSTRUCTION SITE, SHALL RELIEVE THE GENERAL CONTRACTOR AND OR SUBCONTRACTORS AND ANY OTHER ENTITY OF THEIR OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES. THE GENERAL CONTRACTOR AND OR SUBCONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY, AND WARRANTS THAT THIS INTENT IS EVIDENT BY ACCEPTING THIS WORK.

STEEL:

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC CODE AND ASTM SPECIFICATIONS.

   "ALL FLAT PLATE STEEL SHALL BE ASTM A572-65 (Fy=65KSI) UNLESS OTHERWISE SPECIFIED.
2. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-80XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325N, THREAD INCLUDED WITH SHEAR PLANE (UNLESS OTHERWISE NOTED).
3. ALL BOLTED CONNECTIONS TO BE INSTALLED TO A SNUG-TIGHTENED CONDITION IN ACCORDANCE WITH AISC 13 PART 16.2, "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", SECTION 8.1, UNLESS OTHERWISE SPECIFIED. WHEN "X" TYPE BOLTS ARE USED, CONTRACTOR MAY BE REQUIRED TO STACK ADDITIONAL WASHERS TO OBTAIN PROPER SNUG TIGHT INSTALLATION. ALL NUTS SHALL BE HEAVY HEX UNLESS OTHERWISE NOTED.
4. ALL STEEL, AFTER FABRICATION, SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH MULTIPLE COATS OF ZRC COLD GALVANIZING COMPOUND ACHEIVING A MINIMUM OF 4 MILS DRY FILM PER ASTM A 780.
5. ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. CONTRACTOR IS REQUIRED TO PROVIDE FDH ENGINEERING, INC. WITH A PASSING CERTIFIED WELDING INSPECTION FOR ALL WELDS.
6. STRUCTURAL STEEL MAY NOT BE TORCH CUT FOR FABRICATION. ALL STEEL FABRICATION MUST FOLLOW AISC STANDARDS.

MISC. NOTES:

1. ALL MODIFICATIONS ARE ASSUMED TO BE MADE ON AN EMPTY TOWER. CONTRACTOR IS RESPONSIBLE TO MAKE PROVISIONS TO SUPPORT OR WORK AROUND EXISTING ANTENNAS AND TRANSMISSION LINES. MODIFICATIONS MUST BE CONTINUOUS THROUGH ALL AREAS SHOWN.
2. CONTRACTOR FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

FABRICATION NOTES:

1. ALL DIMENSIONS ARE PRELIMINARY UNTIL FIELD VERIFIED BY CONTRACTOR. ANY CHANGES MUST BE APPROVED BY ENGINEER OF RECORD IN WRITING PRIOR TO FABRICATION AND INSTALLATION.
2. NEW STEEL MEMBERS MUST HAVE SINGLE DRILLED HOLES. SLOTTED AND DOUBLE DRILLED HOLES ARE NOT ACCEPTABLE MEANS OF FABRICATION.

SUBSTITUTES AND/OR EQUALS:

1. IF CONTRACTOR WISHES TO FURNISH OR USE A SUBSTITUTE ITEM OF MATERIAL OR EQUIPMENT, CONTRACTOR SHALL FIRST MAKE WRITTEN APPLICATION TO ENGINEER OF RECORD FOR ACCEPTANCE THEREOF, CERTIFYING THAT THE PROPOSED SUBSTITUTE WILL PERFORM ADEQUATELY THE FUNCTIONS AND ACHIEVE THE RESULTS CALLED FOR BY THE GENERAL DESIGN, BE SIMILAR IN SUBSTANCE TO THAT SPECIFIED AND SUITED TO THE SAME USE AS THAT SPECIFIED. ALL VARIATIONS OF THE PROPOSED SUBSTITUTE FROM THAT SPECIFIED WILL BE IDENTIFIED IN THE APPLICATION AND AVAILABLE MAINTENANCE, REPAIR AND REPLACEMENT SERVICE WILL BE INDICATED. THE APPLICATION WILL ALSO CONTAIN AN ITEMIZED ESTIMATE OF ALL COSTS OR CREDITS THAT WILL RESULT DIRECTLY OR INDIRECTLY FROM ACCEPTANCE OF SUCH SUBSTITUTE INCLUDING COSTS OF REDESIGN AND CLAIMS OF OTHER CONTRACTORS AFFECTED BY THE RESULTING CHANGE. ALL OF WHICH WILL BE CONSIDERED BY ENGINEER OF RECORD IN EVALUATION OF THE PROPOSED SUBSTITUTE. ENGINEER OF RECORD MAY REQUIRE CONTRACTOR TO FURNISH ADDITIONAL DATA ABOUT THE PROPOSED SUBSTITUTE.

NEW MONOPOLE REINFORCEMENT NOTES:

1. CONTRACTOR TO FIELD VERIFY PROPOSED LOCATION OF REINFORCEMENT TO ENSURE THAT PROPER SPACING CAN BE MET.
2. CONTRACTOR TO REPLACE AND/OR RELOCATE ANY CLIMBING PEGS THAT INTERFERE WITH THE INSTALLATION OF FLAT PLATE.
3. ALL AJAX CONNECTIONS TO USE HIGH TENSILE SLEEVE PROVIDED BY MANUFACTURER. AJAX BOLT ASSEMBLY TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS. SEE AJAX BOLT ASSEMBLY DETAIL ON SHEET S-3.
4. ALL SHEAR SLEEVES TO BE HOT DIPPED GALVANIZED PRIOR TO INSTALLATION.
5. PRIOR TO FLAT PLATE INSTALLATION, SLIP JOINTS MUST BE TIGHTENED WITH A MINIMUM JACKING FORCE OF 6000 LBS.
6. NEW REINFORCEMENT TO BE INSTALLED ON THE CENTER OF PROPOSED SIDE UNLESS OTHERWISE NOTED.
7. EXISTING COAX BANDS TO BE REPLACED AFTER REINFORCEMENT INSTALLATION. NEW FLAT PLATE TO BE INSTALLED BENEATH EXISTING COAX BANDS.

CONSTRUCTION NOTES:

1. CONTRACTOR TO FIELD VERIFY PROPOSED REINFORCEMENT LAYOUT PRIOR TO CONSTRUCTION. IF ISSUES ARE PRESENT IN THE FIT OF THE REINFORCEMENT, CONTRACTOR TO CONTACT ENGINEER OF RECORD OR FDH ENGINEERING PROJECT MANAGER PRIOR TO PROCEEDING WITH PROPOSED MODIFICATION OR FABRICATION.

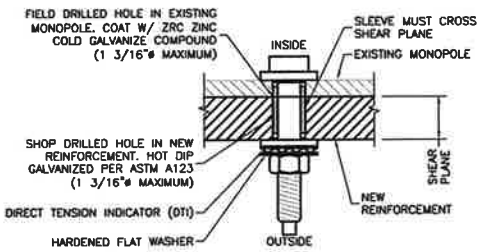
COLD GALVANIZATION/SURFACE PREPARATION NOTES:

1. CONTRACTOR TO USE ZINGA OR ZRC COLD GALVANIZATION COMPOUNDS OR APPROVED EQUIVALENT.
2. PREPARE RUSTED/CORRODED SURFACE FOR TREATMENT ACCORDING TO MANUFACTURE'S RECOMMENDATIONS.
3. CONTRACTOR TO APPLY (2) COATS OF COLD GALVANIZATION COMPOUND PER MANUFACTURER'S RECOMMENDATION. DRYING AND CURING TIMES MUST BE UTILIZED PER MANUFACTURER'S RECOMMENDATION.
4. APPLY ALL COATINGS BY BRUSH IN CALM WIND CONDITIONS. THE USE OF AEROSOL IS NOT PERMITTED.
5. IF THE TOWER IS PAINTED, BRUSH PAINT ALL TREATED AREAS TO MATCH TOWER AFTER COLD GALVANIZATION COMPOUND IS ALLOWED TO CURE.

AJAX PRETENSION JOINTS:

1. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) & HARDENED WASHERS. ALL AJAX M20 BOLTS WITH REAR SLEEVES SHALL BE PRETENSIONED & TIGHTENED UNTIL DIRECT TENSION INDICATOR (DTI) WASHER SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED.
2. ALL DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

   APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
   1413 ROCKINGHAM ROAD
   BELLOWS FALLS, VERMONT 05101, USA
   PHONE: 1-800-552-1999
   WEBSITE: WWW.APPLIEDBOLTING.COM
3. USE DIRECT TENSION INDICATOR (DTI WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.
4. USE HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RE 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.
5. CONTRACTOR SHALL FOLLOW DTI MANUFACTURES'S INSTRUCTION FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.
6. EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OFF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.
7. REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED ("NON-TC") BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION. THE THIRD PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD PARTY BOLT INSPECTION SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.



AJAX BOLT ASSEMBLY
SCALE: NTS

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PREPARED FOR:

CROWN CASTLE

STATE OF CONNECTICUT
BRADLEY R. NEWMAN
20630
LICENSED
PROFESSIONAL ENGINEER
06/05/14

BRADLEY R. NEWMAN, P.E.
CONNECTICUT LIC. NO. 20630

DRAWN BY:	KM
CHECKED BY:	JJT
ENG APPV'D:	BRN
PROJECT NO:	148804400

SUBMITTALS

DATE	DESCRIPTION	REV
06/05/13	CONSTRUCTION	0

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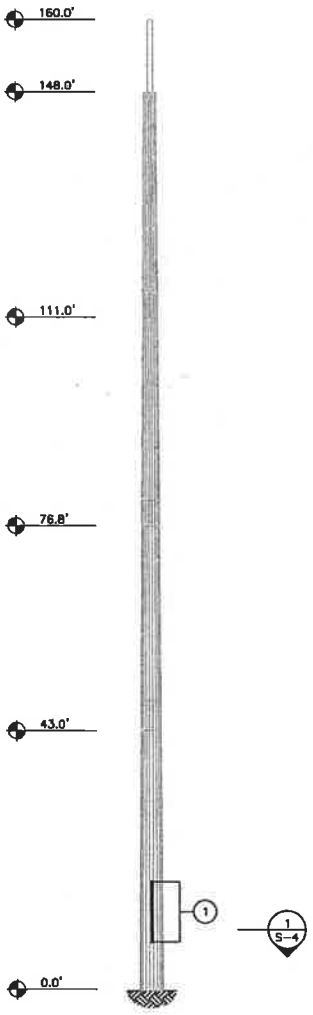
BURNT HOUSE

SITE NUMBER:
876313

SITE ADDRESS:
1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
S-3



TOWER ELEVATION
SCALE: NTS

- CONTRACTOR SHALL VERIFY ALL APPURTENANCE CONDITIONS AND DIMENSIONS IN RELATIONSHIP TO THIS MODIFICATION. APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THIS MODIFICATION. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE PRIOR TO PROCEEDING WITH THE WORK.
- ALL MODIFICATIONS TO BE INSTALLED CONTINUOUSLY THROUGH EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT NOT TO BE DAMAGED OR TAKEN OFF AIR DURING INSTALLATION.
- SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING ANTENNA LOADING.
- CONTRACTOR TO FIELD VERIFY DIMENSIONS & LOCATIONS OF PROPOSED MODIFICATIONS PRIOR TO STEEL FABRICATION.

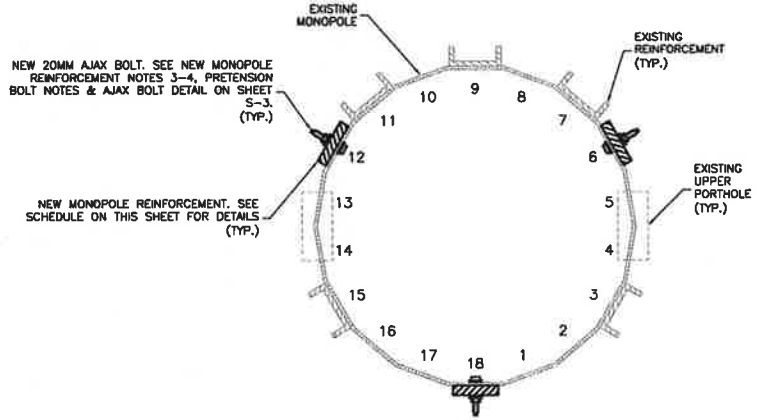
TOWER MODIFICATION SCHEDULE

NO.	TYPE OF MODIFICATION	BOTTOM ELEV. (FT)	TOP ELEV. (FT)
1	INSTALLATION OF NEW MONOPOLE REINFORCEMENT. SEE THIS SHEET FOR DETAILS.	8.0±	18.0±
	REFER TO STRUCTURAL ANALYSIS FOR COAX INFORMATION		

CROWN CASTLE REINFORCEMENT INSTALLATION SCHEDULE

ELEVATION	QTY.	FLAT NUMBER	CCI-65FP PLATE (65 KSI)	MAX. STITCH BOLT SPACING	AJAX BOLT QUANTITY	STEEL WEIGHT (LBS.)
8'-0"± TO 18'-0"±	3	6 - 8 - 12	CCI-SFP-06010010	1'-4"	20*	204.0*
				TOTAL	60	612.0

*QUANTITY SHOWN IS FOR (1) REINFORCEMENT PLATE.



MONOPOLE REINFORCEMENT LAYOUT
SECTION VIEW

1/S-4 SECTION
NTS

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ENGINEERING INNOVATION

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SHEET TITLE
MODIFICATION SCHEDULE
&
FLAT PLATE INSTALLATION DETAILS

SHEET NUMBER
S-4