Robinson+Cole

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Also admitted in Massachusetts

August 6, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
41 Manitock Hill Road, Waterford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 107-foot level of the existing 136-foot tower at 41 Manitock Hill Road in Waterford, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of this tower in 2005. Cellco now intends to replace nine (9) of its existing antennas with three (3) model LNX-6514DS-VTM, 700 MHz antennas; three (3) model HBXX-6516DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same 107-foot level on the tower. Cellco also intends to install six (6) remote radio heads ("RRHs") and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

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 Daniel M. Steward, First Selectman for the Town of Waterford and the City of New London Water Department, the owner of the Property. A copy of this letter is also being sent to Crown Castle, the tower owner.

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 replacement antennas and RRH's will be located at the 107-foot level on the 136-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 worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

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

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Daniel M. Steward, Waterford First Selectman
City of New London Water Department
Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

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

POWERED BY ANDREW.

Electrical Specifications

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

Mechanical Specifications

Color | Radome Material	Light gray | Fiberglass, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph
Antenna Dimensions, L x W x D	1847.0 mm x 301.0 mm x 181.0 mm | 72.7 in x 11.9 in x 7.1 in
Net Weight	17.6 kg | 38.8 lb
Model with factory installed AISG 2.0 RET	LNX-6514DS-A1M

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: June 11, 2014

Product Specifications

COMMSCOPE®

on the go

HBXX-6516DS-VTM

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

- Fully supports PCS 1900, GSM 1800, UMTS 2100, and AWS spectrum
- Each DualPol® array can be independently adjusted for greater flexibility
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Great solution to maximize network coverage and capacity

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain, dBi	17.7	18.0	18.0
Beamwidth, Horizontal, degrees	67	65	63
Beamwidth, Vertical, degrees	7.5	7.0	6.5
Beam Tilt, degrees	0–10	0–10	0–10
USLS, typical, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4:1 | 15.6	1.4:1 | 15.6	1.4:1 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm
Lightning Protection	dc Ground	dc Ground	dc Ground

Mechanical Specifications

Color | Radome Material	Light gray | PVC, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 4
Wind Loading, maximum	419.5 N @ 150 km/h 94.3 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1294.00 mm | 50.94 in
Width	305.00 mm | 12.01 in
Net Weight	13.90 kg | 30.64 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBXX-6516DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBXX-6516DS-A2M

Regulatory Compliance/Certifications

Agency	**Classification**
RoHS 2002/95/EC	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)

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Product Specifications

HBXX-6516DS-VTM

ISO 9001:2008 Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

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Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

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

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4	0 ° | 18.4	0 ° | 18.7
	3 ° | 18.7	3 ° | 18.7	3 ° | 18.9
	6 ° | 18.4	6 ° | 18.5	6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

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Product Specifications

HBXX-6517DS-VTM

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

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

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

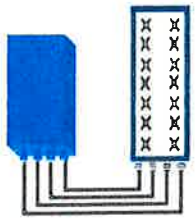
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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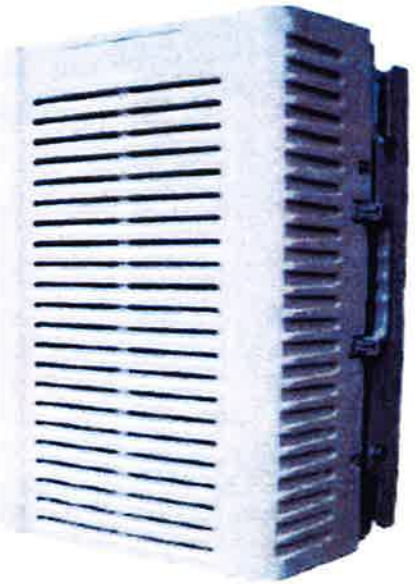
PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

	RRH2x60
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver 1900 HW version 1900A HW version	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA
	Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



** Not a Verizon Wireless deployed product

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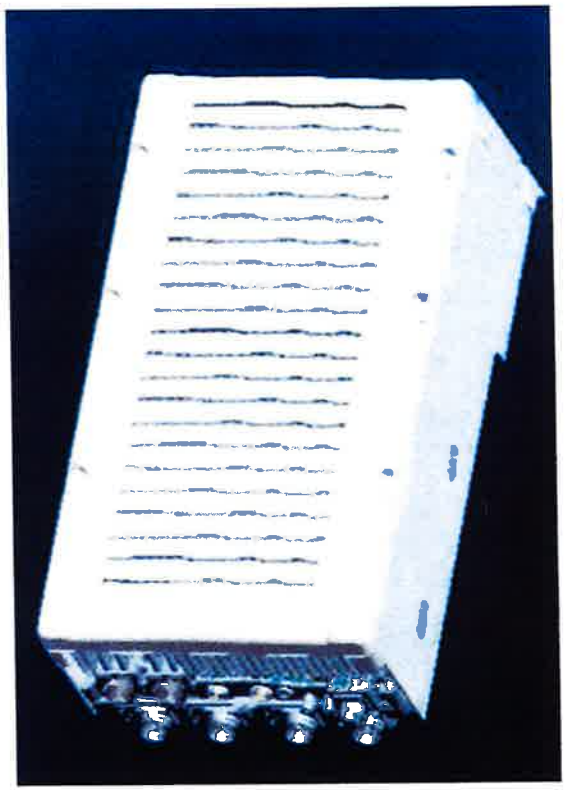
NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



**- Includes solar shield but not mounting brackets (8 lbs.)

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Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX³ accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

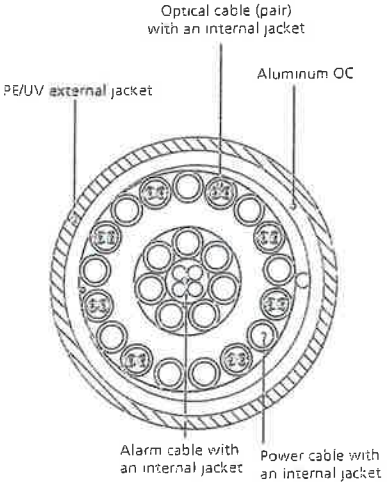


Figure 2: Construction Detail

* 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: Waterford 2								
Tower Height: 136Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Nextel	9	100	127	0.0201	851	0.5673	3.54%	
*Sprint CDMA/LTE	5	693	137	0.0664	1900	1.0000	6.64%	
*Sprint CDMA/LTE	1	390	137	0.0075	850	0.5667	1.32%	
*Sprint CDMA/LTE	2	693	137	0.0266	2500	1.0000	2.66%	
*MetroPCS	3	443.61	89	0.0604	2140	1.0000	6.04%	
*AT&T GSM	2	296	97	0.0226	880	0.5867	3.86%	
*AT&T GSM	2	427	97	0.0326	1900	1.0000	3.26%	
*AT&T UMTS	2	500	97	0.0382	880	0.5867	6.51%	
*AT&T UMTS	2	500	97	0.0382	1900	1.0000	3.82%	
*AT&T LTE	1	500	97	0.0191	740	0.4933	3.87%	
*T-Mobile LTE	2	24	119	0.0012	2100	1.0000	0.12%	
*T-Mobile GSM/UMTS	2	12	119	0.0006	1950	1.0000	0.06%	
*T-Mobile UMTS	2	12	119	0.0006	2100	1.0000	0.06%	
Verizon PCS	**11**	**558**	**107**	**0.1928**	**1970**	**1.0000**	**19.28%**	
Verizon Cellular	**9**	**309**	**107**	**0.0873**	**869**	**0.5793**	**15.08%**	
Verizon AWS	**1**	**2832**	**107**	**0.0889**	**2145**	**1.0000**	**8.89%**	
Verizon 700	**1**	**1118**	**107**	**0.0351**	**746**	**0.4973**	**7.06%**	
								92.07%
* Source: Siting Council								

ATTACHMENT 3

June 24, 2015

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6580

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	117854
	Carrier Site Name:	Waterford 2 CT
Crown Castle Designation:	**Crown Castle BU Number:**	876338
	Crown Castle Site Name:	WATERFORD
	Crown Castle JDE Job Number:	338056
	Crown Castle Work Order Number:	1078928
	Crown Castle Application Number:	300758 Rev. 6
Engineering Firm Designation:	**B+T Group Project Number:**	99072.001.01
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT** **Latitude *41° 21' 16.42"*, Longitude *-72° 9' 3.38"*** **136 Foot - Self Support Tower**	

Dear Marianne Dunst,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 799196, in accordance with application 300758, revision 6.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:
B+T Engineering, Inc.

Jacob Johnson, E.I.T.
Project Engineer

Chad E. Tuttle, P.E.
President
COA: PEC.0001564 Expires: 2/10/2016

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
6-24-15

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 136 ft. Self-Support tower designed by Pirod Manufactures Inc. in February of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. This tower was modified in 2008 by Vertical Structures to accommodate additional loading.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	107.0	3	Alcatel Lucent	RRH2X60-AWS	1	1-5/8	--
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		3	Commscope	HBXX-6516DS-A2M			
		3	Commscope	HBXX-6517DS-A2M			
		3	Commscope	LNX-6514DS-A1M			

Table 2 - Existing 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
136.0	137.0	3	Rfs Celwave	APXVSPP18-C-A20	3	1-1/4	1
	136.0	3	Rfs Celwave	IBC1900BB-1			
		3	Rfs Celwave	IBC1900HG-2A			
		1	--	Platform Mount [LP 405-1]			
134.0	134.0	3	Alcatel Lucent	TME-1900MHz RRH (65MHz)	--	--	1
		2	--	Pipe Mount [PM 601-3]			
	133.0	3	Alcatel Lucent	TME-800MHz 2X50W RRH W/FILTER			
127.0	127.0	12	Decibel	DB844H90E-XY	12	1-1/4	3
		1	--	Sector Mount [SM 410-3]			
117.0	119.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	12 1	1-5/8 1-1/4	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 144/1			
	117.0	1	--	Sector Mount [SM 410-3]			
107.0	107.0	**3**	**Alcatel Lucent**	**RRH2x40-AWS**	--	--	**2**
		3	**Antel**	**BXA-171063/12CF**			
		3	**Antel**	**BXA-185063/8CF**			
		3	**Antel**	**BXA-70063/6CF**			
		3	Antel	BXA-80063/4CF	13	1-5/8	1
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	Rfs Celwave	FD9R6004/2C-3L			
		1	--	Sector Mount [SM 307-3]			
97.0	97.0	1	Andrew	SBNH-1D6565C	6 2 1	1-1/4 5/8 3/8	1
		6	Ericsson	RRUS 11			
		1	Kmw Communications	AM-X-CD-14-65-00T-RET			
		1	Kmw Communications	AM-X-CD-16-65-00T-RET			
		3	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	--	T-Arm Mount [TA 702-3]			
87.0	89.0	3	Kathrein	800 10504	6	7/8	1
	87.0	3	Kathrein	860 10118			
		1	--	Sector Mount [SM 104-3]			
80.0	81.0	1	Gps	GPS_A	1	1/2	1
	80.0	1	--	Side Arm Mount [SO 701-1]			
72.0	72.0	2	Gps	GPS_A	2	1/2	1
		2	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) **Equipment To Be Removed**
3) Abandoned Equipment; Considered In This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136	136	1	Generic	Low Profile Platform	12	1 5/8
		12	allgon	7184.05		
127	127	3	Generic	T-Frames	12	1-5/8
		12	swedcom	ALP9212		
117	117	3	Generic	T-Frames	12	1 5/8
		12	swedcom	ALP9212		
102	102	2	Generic	6'-8" Rigid Side Arms	2	1-5/8
		2	decibel	DB810		
80	80	2	Generic	GPS Antennas Leg Mounted	2	1/2

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate Rev #6	300758	CCI Sites
Tower Manufacturer Drawing	PiROD, Eng File No: A-115474	1441523	CCI Sites
Tower Modification Drawing	Vertical Structures, Project No: 2009-004-007	2125417	CCI Sites
Post Modification Inspection	Vertical Structures, Project No: 2009-004-007	2376132	CCI Sites
Foundation Drawing	PiROD, Eng File No: A-115474	2068030	CCI Sites
Geotech Report	SEA Consultants, Date: 01/05/1999	2035622	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 06/20/2015	CCI Sites

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	136 - 132.917	Leg	1 1/2	2	-1.565	26.530	5.9	Pass
T2	132.917 - 130	Leg	1 1/2	15	3.119	33.498	9.3	Pass
T3	130 - 110	Leg	2	31	34.935	67.690	51.6	Pass
T4	110 - 95.2708	Leg	2 1/4	97	-81.813	129.056	63.4	Pass
T5	95.2708 - 90	Leg	2 1/4	144	-103.914	146.995	70.7	Pass
T6	90 - 80	Leg	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	168	-110.568	187.197	59.1	Pass
T7	80 - 60	Leg	Pirod 105217	177	-152.639	184.672	82.7	Pass
T8	60 - 40	Leg	Pirod 105218	192	-184.894	258.238	71.6	Pass
T9	40 - 20	Leg	Pirod 105218	207	-212.208	258.238	82.2	Pass
T10	20 - 0	Leg	Pirod 105219	222	-236.886	343.622	68.9	Pass
T1	136 - 132.917	Diagonal	3/4	7	-1.227	3.457	35.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	132.917 - 130	Diagonal	3/4	22	-1.403	5.221	26.9	Pass
T3	130 - 110	Diagonal	7/8	43	-3.900	8.195	47.6	Pass
T4	110 - 95.2708	Diagonal	1	106	-5.402	12.302	43.9	Pass
T5	95.2708 - 90	Diagonal	1	153	-6.313	11.891	53.1	Pass
T6	90 - 80	Diagonal	L3x3x3/16	173	-7.706	17.600	43.8 62.9 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	179	-6.233	9.648	64.6 67.0 (b)	Pass
T8	60 - 40	Diagonal	L3x3x3/16	193	-5.749	13.368	43.0 52.7 (b)	Pass
T9	40 - 20	Diagonal	L3x3x3/16	208	-5.694	10.672	53.4	Pass
T10	20 - 0	Diagonal	L3x3x5/16	223	-7.412	13.887	53.4	Pass
T3	130 - 110	Horizontal	3/4	53	-0.385	2.481	15.5	Pass
T4	110 - 95.2708	Horizontal	7/8	114	-0.738	3.875	19.0	Pass
T2	132.917 - 130	Secondary Horizontal	3/4	29	-0.095	2.918	3.2	Pass
T5	95.2708 - 90	Secondary Horizontal	1 1/2	155	-1.800	30.746	5.9	Pass
T1	136 - 132.917	Top Girt	5x3/8	4	-0.754	2.023	37.3	Pass
T2	132.917 - 130	Top Girt	7/8	18	-0.226	5.406	4.2	Pass
T3	130 - 110	Top Girt	7/8	36	-0.488	5.488	8.9	Pass
T4	110 - 95.2708	Top Girt	1	100	-1.367	7.386	18.5	Pass
T2	132.917 - 130	Bottom Girt	7/8	21	-0.549	5.406	10.1	Pass
T3	130 - 110	Bottom Girt	7/8	38	-1.770	4.348	40.7	Pass
T5	95.2708 - 90	Bottom Girt	1	145	-1.213	6.010	20.2	Pass
							Summary	
						Leg (T7)	82.7	Pass
						Diagonal (T7)	67.0	Pass
						Horizontal (T4)	19.0	Pass
						Secondary Horizontal (T5)	5.9	Pass
						Top Girt (T1)	37.3	Pass
						Bottom Girt (T3)	40.7	Pass
						Bolt Checks	68.9	Pass
						Rating =	82.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
--	Anchor Rods	Base	43.4	Pass
1	Base Foundation (Structural)	Base	25.6	Pass
1	Base Foundation (Soil Interaction)	Base	89.1	Pass

Structure Rating (max from all components) =	89.1%

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

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe (E)	136	HBXX-6517DS-A2M (P)	107
APXVSPP18-C-A20 w/ Mount Pipe (E)	136	LNX-6514DS-A1M (P)	107
APXVSPP18-C-A20 w/ Mount Pipe (E)	136	LNX-6514DS-A1M (P)	107
IBC1900BB-1 (E)	136	LNX-6514DS-A1M (P)	107
IBC1900BB-1 (E)	136	RRH2X60-AWS (P)	107
IBC1900BB-1 (E)	136	RRH2X60-AWS (P)	107
IBC1900HG-2A (E)	136	RRH2X60-AWS (P)	107
IBC1900HG-2A (E)	136	RRH2x60-700 (P)	107
IBC1900HG-2A (E)	136	RRH2x60-700 (P)	107
(2) 6' x 2" Mount Pipe (E)	136	RRH2x60-700 (P)	107
(2) 6' x 2" Mount Pipe (E)	136	RRH2X60-PCS (P)	107
(2) 6' x 2" Mount Pipe (E)	136	RRH2X60-PCS (P)	107
Platform Mount [LP 405-1] (E)	136	RRH2X60-PCS (P)	107
TME-800MHz 2X50W RRH W/FILTER (E)	134	Sector Mount [SM 307-3] (E-4 M. Pipes / Sector)	107
TME-800MHz 2X50W RRH W/FILTER (E)	134	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	97
TME-800MHz 2X50W RRH W/FILTER (E)	134	AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	97
TME-1900MHz RRH (65MHz) (E)	134	SBNH-1D6565C w/ Mount Pipe (E)	97
TME-1900MHz RRH (65MHz) (E)	134	7770.00 w/ Mount Pipe (E)	97
TME-1900MHz RRH (65MHz) (E)	134	7770.00 w/ Mount Pipe (E)	97
(2) Pipe Mount [PM 601-3] (E)	134	7770.00 w/ Mount Pipe (E)	97
(4) DB844H80E-XY w/ Mount Pipe (AB)	127	(2) RRUS 11 (E-as per photo)	97
(4) DB844H80E-XY w/ Mount Pipe (AB)	127	(2) RRUS 11 (E-as per photo)	97
(4) DB844H80E-XY w/ Mount Pipe (AB)	127	(2) RRUS 11 (E-as per photo)	97
Sector Mount [SM 410-3] (AB)	127	(2) LGP21401 (E)	97
Pipe Mount [PM 601-3] (E-Mount Attachment)	127	(2) LGP21401 (E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	117	(2) LGP21401 (E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	117	DC6-48-60-18-8F (E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	117	4' x 3" Pipe Mount (E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	117	4' x 3" Pipe Mount (E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	117	4' x 3" Pipe Mount (E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	117	T-Arm Mount [TA 702-3] (E)	97
KRY 112 144/1 (E)	117	Pipe Mount [PM 601-3] (E-Mount Attachment)	97
KRY 112 144/1 (E)	117	800 10504 w/ Mount Pipe (E)	87
KRY 112 144/1 (E)	117	800 10504 w/ Mount Pipe (E)	87
Sector Mount [SM 410-3] (E)	117	800 10504 w/ Mount Pipe (E)	87
Pipe Mount [PM 601-3] (E-Mount Attachment)	117	860 10118 (E)	87
BXA-80063/4CF (E)	107	860 10118 (E)	87
BXA-80063/4CF (E)	107	860 10118 (E)	87
BXA-80063/4CF (E)	107	6' x 2" Mount Pipe (E)	87
(2) FD9R6004/2C-3L (E)	107	6' x 2" Mount Pipe (E)	87
(2) FD9R6004/2C-3L (E)	107	6' x 2" Mount Pipe (E)	87
(2) FD9R6004/2C-3L (E)	107	Sector Mount [SM 104-3] (E)	87
DB-T1-6Z-8AB-0Z (E)	107	GPS_A (E)	80
HBXX-6516DS-A2M (P)	107	Side Arm Mount [SO 701-1] (E)	80
HBXX-6516DS-A2M (P)	107	GPS_A (E)	72
HBXX-6516DS-A2M (P)	107	GPS_A (E)	72
HBXX-6517DS-A2M (P)	107	Side Arm Mount [SO 701-1] (E)	72
HBXX-6517DS-A2M (P)	107	Side Arm Mount [SO 701-1] (E)	72

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	B	1 @ 3.08333

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 82.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 245 K
SHEAR: 23 K

UPLIFT: -218 K
SHEAR: 21 K

AXIAL
76 K
SHEAR 11 K *MOMENT 939 kip-ft*

TORQUE 2 kip-ft
38 mph WIND - 0.750 in ICE

AXIAL
37 K
SHEAR 34 K *MOMENT 2822 kip-ft*

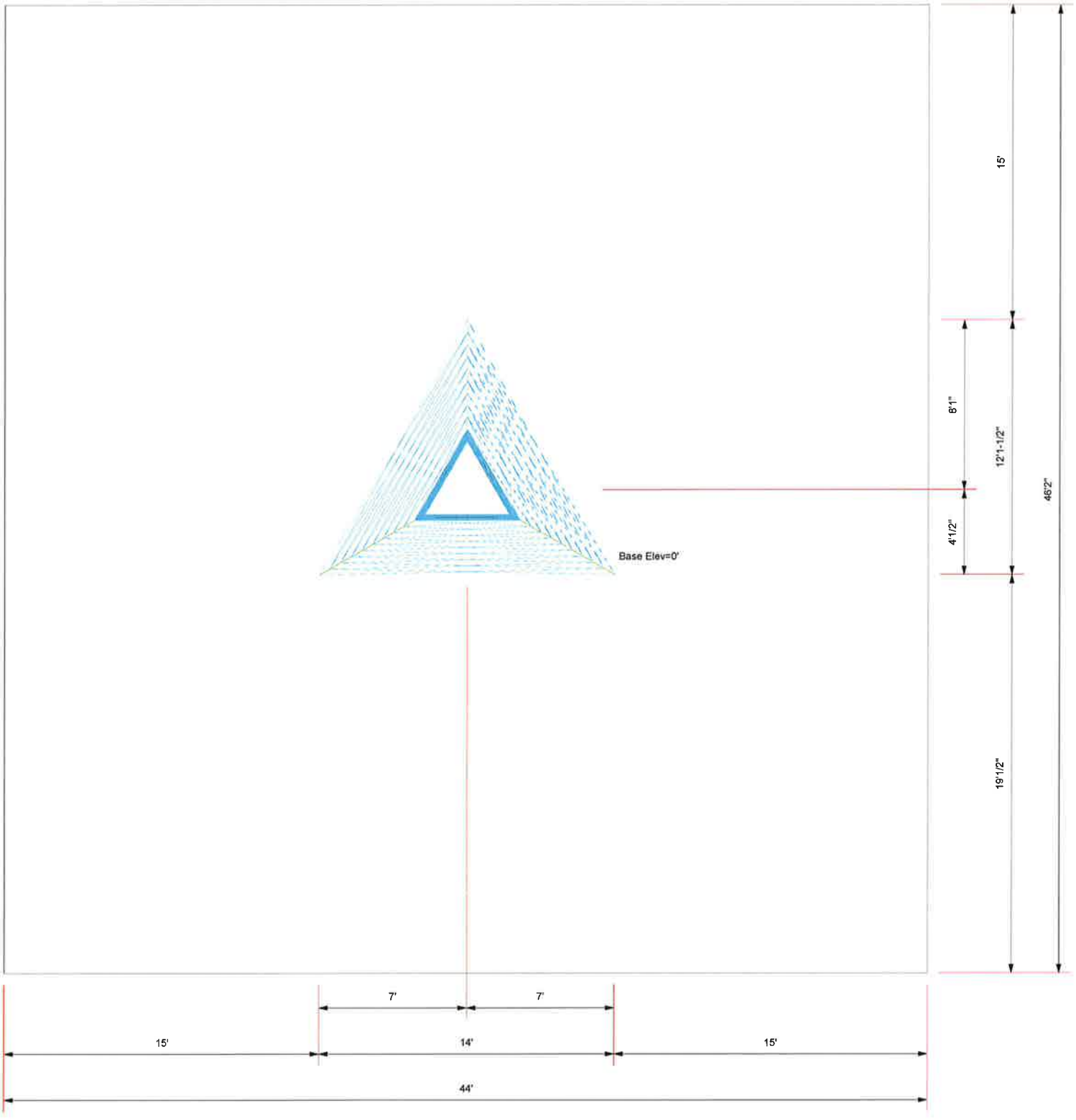
TORQUE 7 kip-ft
REACTIONS - 85 mph WIND

B+T Group
1717 S.Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 587-4630

Job:	99072.001.01 - WATERFORD, CT (BU# 87633
Project:	
Client: Crown Castle	Drawn by: Shashank.S.Rao
Code: TIA/EIA-222-F	Date: 06/24/15
Path:	Scale: NTS
	Dwg No. E-1

Plot Plan

Total Area - 0.05 Acres



B+T GRP

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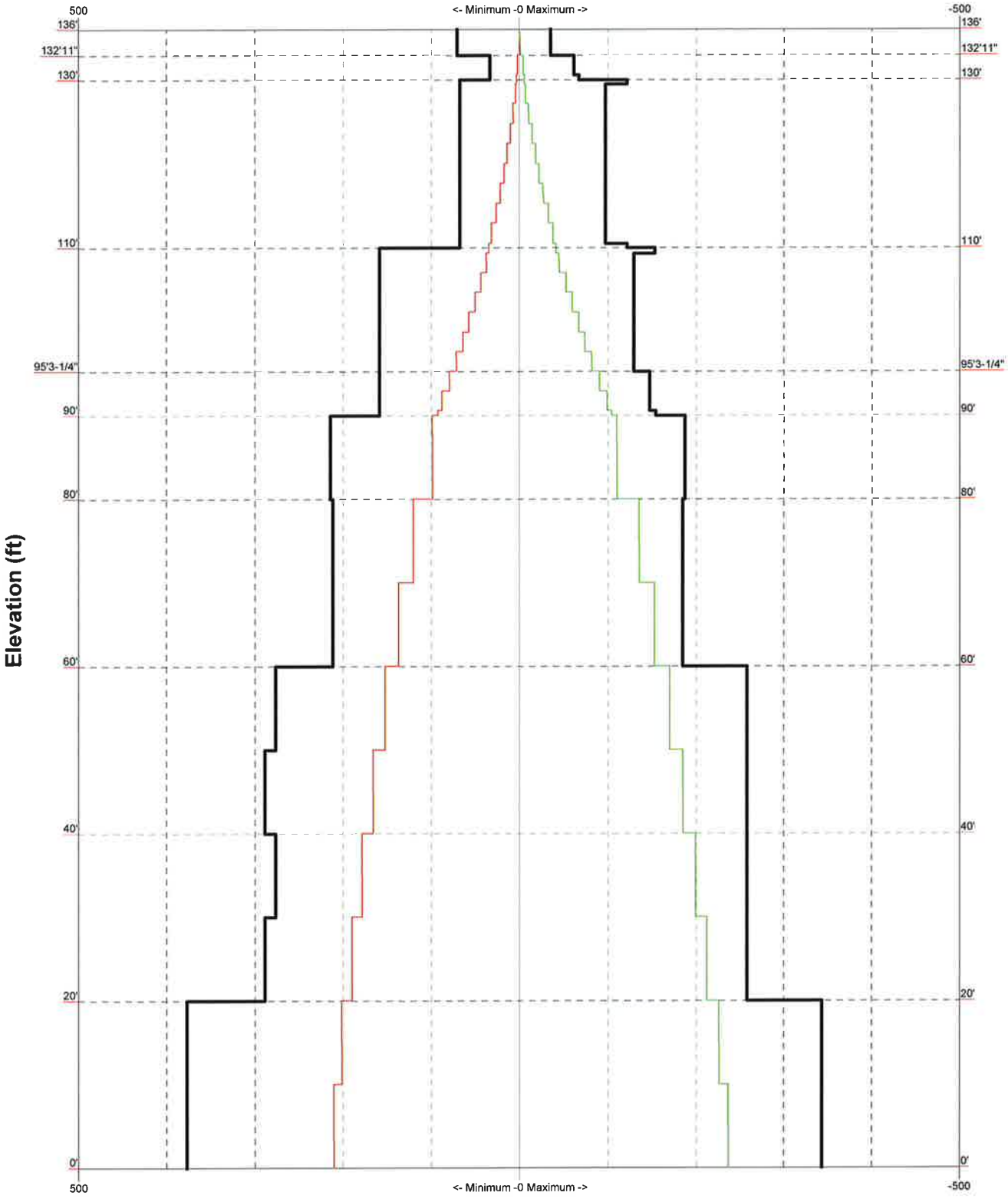
Job: 99072.001.01 - WATERFORD, CT (BU# 876			
Project:			
Client: Crown Castle	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 06/24/15	Scale: NTS	
Path:		Dwg No. E-2	

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Leg Capacity ——— **Leg Compression (K)**



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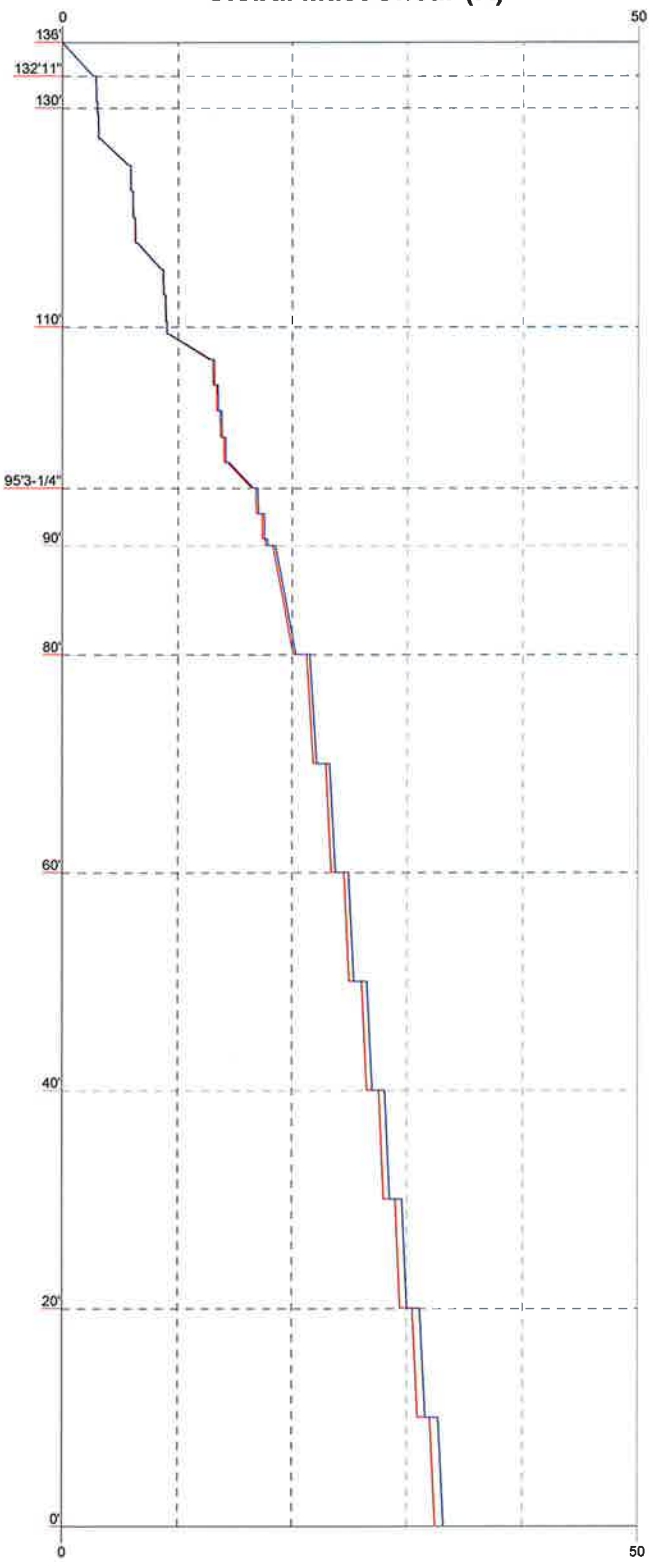
Job: 99072.001.01 - WATERFORD, CT (BU# 876			
Project:			
Client: Crown Castle	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 06/24/15	Scale: NTS	
Path:		Dwg No. E-3	

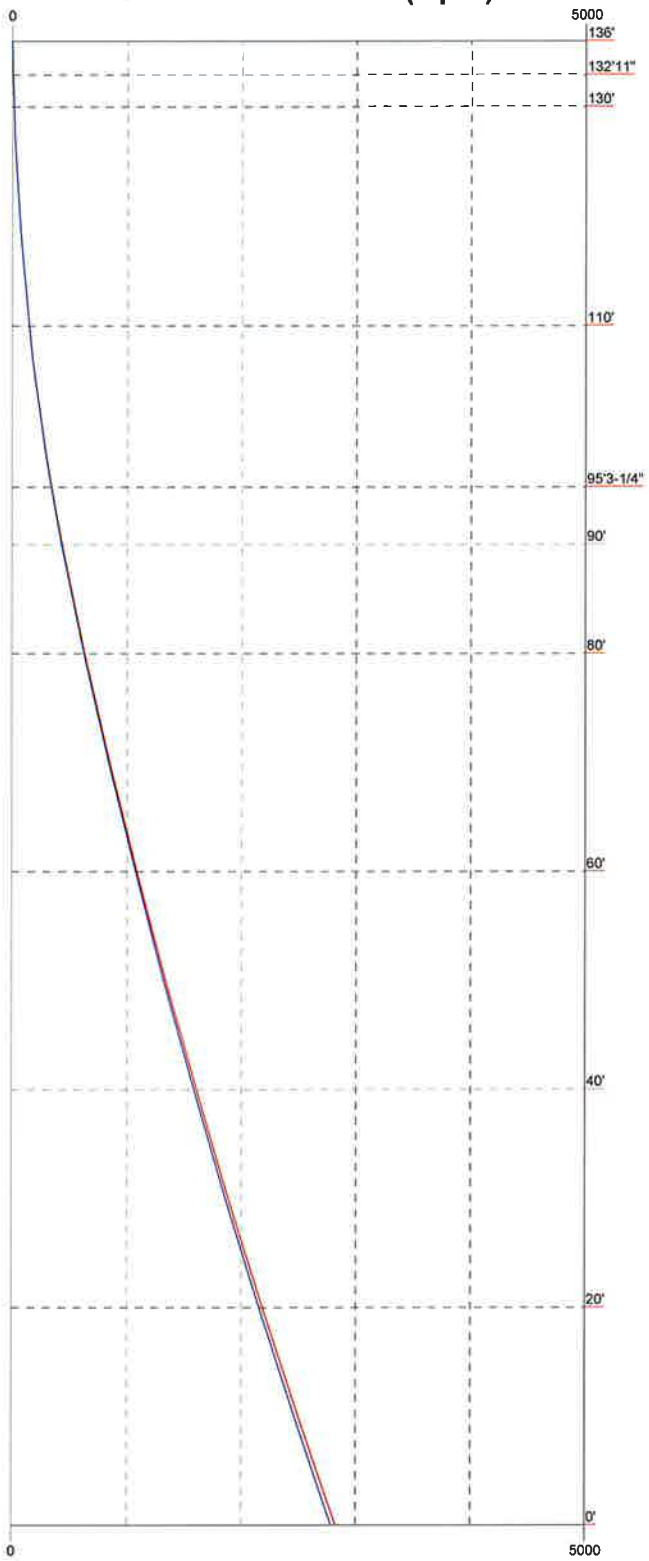
Vx Vz

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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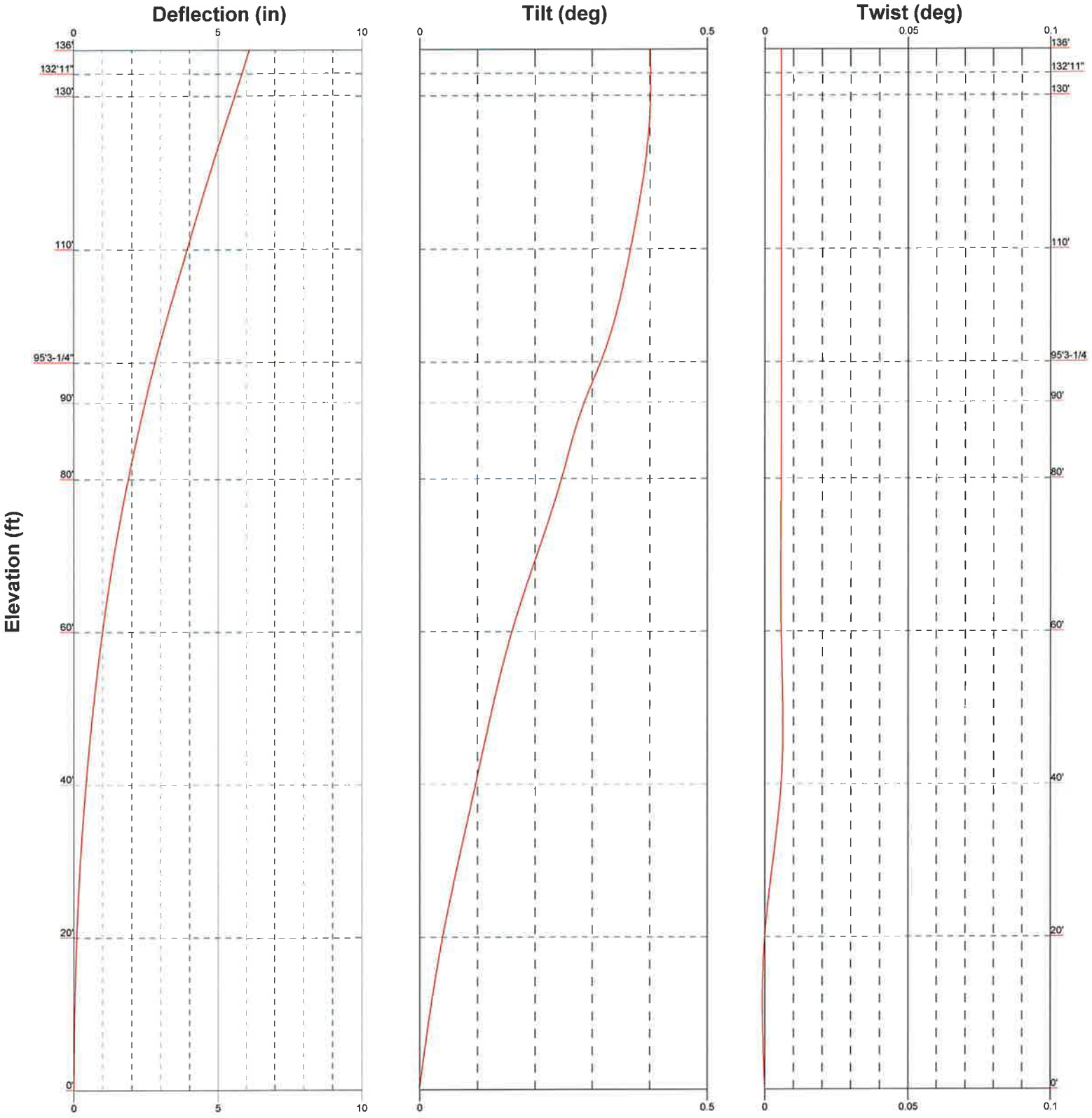
Job: 99072.001.01 - WATERFORD, CT (BU# 876			
Project:			
Client: Crown Castle	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 06/24/15	Scale: NTS	
Path:		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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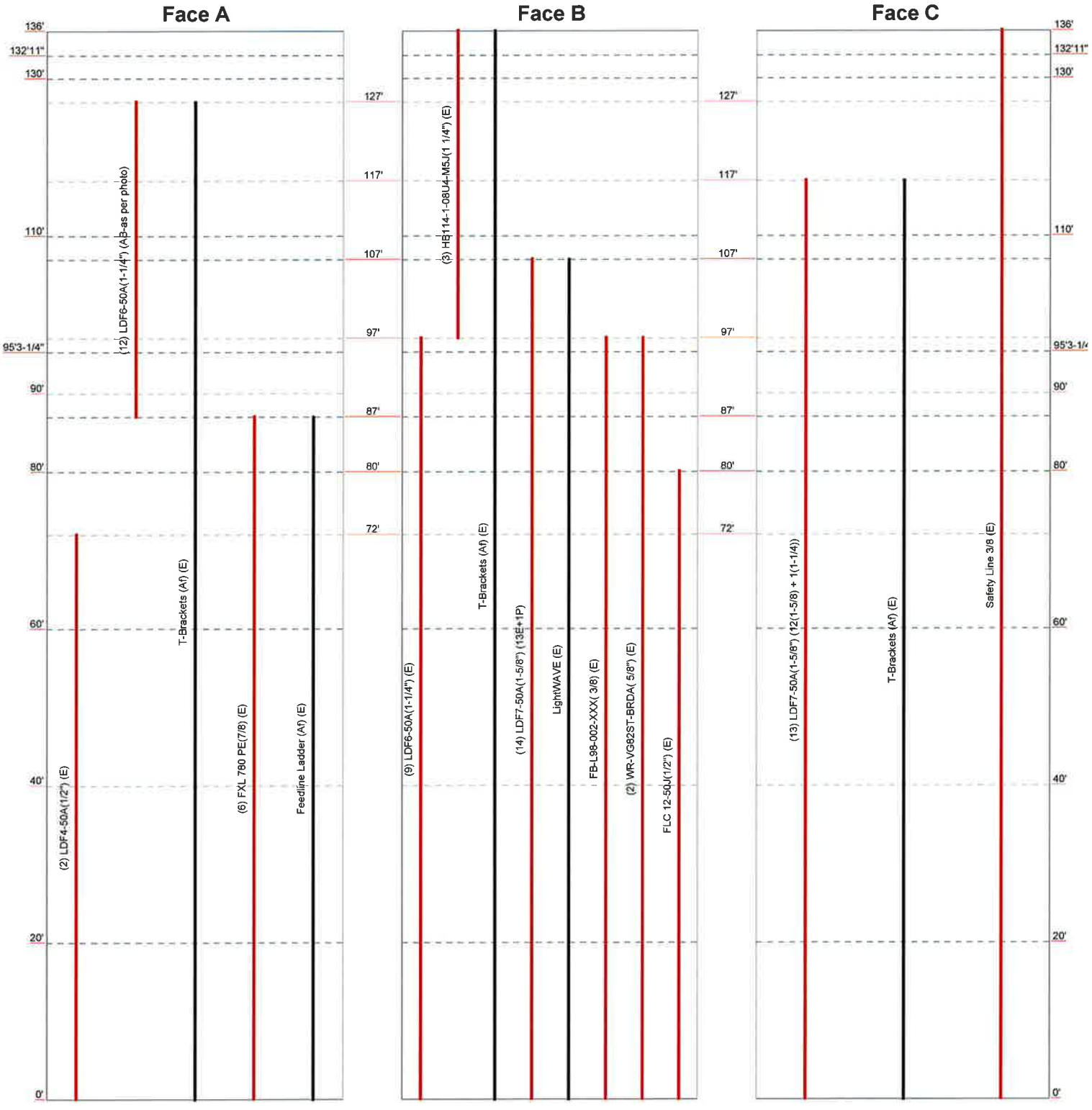
Job: *99072.001.01 - WATERFORD, CT (BU# 876*			
Project:			
Client: Crown Castle	Drawn by: Shashank.S.Rao		App'd:
Code: TIA/EIA-222-F	Date: 06/24/15		Scale: NTS
Path:			Dwg No. E-5

0' - 136'

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



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Phone: (918) 587-4630
FAX: (918) 587-4630

Job: 99072.001.01 - WATERFORD, CT (BU# 876			
Project:			
Client: Crown Castle	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 06/24/15	Scale: NTS	
Path:		Dwg No. E-7	

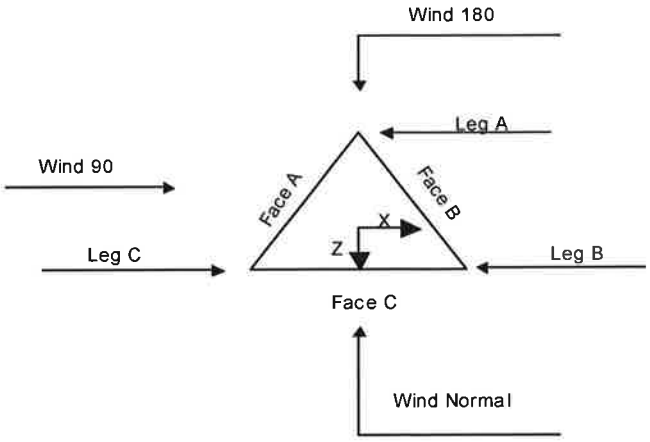
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 4' at the top and 14' at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 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.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	136'-132'11"			4'	1	3'1"
T2	132'11"-130'			4'	1	2'11"
T3	130'-110'			4'	1	20'
T4	110'-95'3-1/4"			4'6"	1	14'8-3/4"
T5	95'3-1/4"-90'			4'10-21/32"	1	5'3-1/4"
T6	90'-80'			5'	1	10'
T7	80'-60'			6'	1	20'
T8	60'-40'			8'	1	20'
T9	40'-20'			10'	1	20'
T10	20'-0'			12'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	136'-132'11"	3'1"	K Brace Down	No	Yes	0.000	0.000
T2	132'11"-130'	2'4-1/2"	X Brace	No	Yes	0.000	6.500
T3	130'-110'	2'4-1/2"	X Brace	No	Steps	6.000	6.000
T4	110'-95'3-1/4"	2'4-1/8"	X Brace	No	Steps	8.000	0.000
T5	95'3-1/4"-90'	2'4-1/8"	X Brace	No	Yes	0.000	7.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	90'-80'	10'	X Brace	No	No	0.000	0.000
T7	80'-60'	10'	X Brace	No	No	0.000	0.000
T8	60'-40'	10'	X Brace	No	No	0.000	0.000
T9	40'-20'	10'	X Brace	No	No	0.000	0.000
T10	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136'-132'11"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 132'11"-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-95'3-1/4"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 95'3-1/4"-90'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 90'-80'	Truss Leg	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 80'-60'	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 60'-40'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 40'-20'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 20'-0'	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T2 132'11"-130'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-95'3-1/4"	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T5 95'3-1/4"-90'	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136'-132'11"	None	Solid Round		A572-50 (50 ksi)	Flat Bar	5x3/8	A36 (36 ksi)
T3 130'-110'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T4 110'-95'3-1/4"	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 132'11"-130'	Solid Round	3/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T5 95'3-1/4"-90'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 136'-132'11"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000
T2 132'11"-130'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000
T3 130'-110'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000
T4 110'-95'3-1/4"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000
T5 95'3-1/4"-90'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000
T6 90'-80'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T7 80'-60'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T8 60'-40'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T9 40'-20'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T10 20'-0'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
136'-132'11"				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
132'11"-130'				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 130'-110'	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110'-95'3-1/4"				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95'3-1/4"-90'				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 90'-80'	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 80'-60'	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 60'-40'	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 40'-20'	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 20'-0'	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T6 90'-80'	1	0.5	0.85	1	0.5	0.85
T7 80'-60'	1	0.5	0.85	1	0.5	0.85
T8 60'-40'	1	0.5	0.85	1	0.5	0.85
T9 40'-20'	1	0.5	0.85	1	0.5	0.85
T10 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 136'-132'11"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T2 132'11"-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T3 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T4 110'-95'3-1/4"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T5 95'3-1/4"-90'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T6 90'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T7 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T8 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T9 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T10 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136'-132'11"	Sleeve DS	0.625 A325N	0	1.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T2 132'11"-130'	Sleeve DS	0.625 A325N	5	1.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T3 130'-110'	Sleeve DS	0.750 A325N	5	1.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 110'-95'3-1/4"	Sleeve DS	1.000 A325N	0	1.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 95'3-1/4"-90'	Flange	1.000 A325N	6	1.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T6 90'-80'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 80'-60'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 60'-40'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 20'-0'	Flange	1.250 A687	6	1.250 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF4-50A(1/2")	A	No	Ar (Leg)	72' - 0'	0.000	0.15	2	2	0.500	0.630		0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
(E) *&&* LDF6-50A(1-1/4") (AB-as per photo)	A	No	Ar (Leg)	127' - 87'	0.000	0.1	12	7	0.500 1.500	1.550		0.001
T-Brackets (Af)	A	No	Af (Leg)	127' - 0'	0.000	0.1	1	1	1.000	1.000	4.000	0.008
(E) *&&* LDF6-50A(1-1/4")	B	No	Ar (Leg)	97' - 0'	0.000	0.1	9	6	0.500	1.980		0.001
(E) HB114-1-08U4-M5J(1 1/4")	B	No	Ar (Leg)	136' - 97'	0.000	0.09	3	3	0.500	1.540		0.001
(E) T-Brackets (Af)	B	No	Af (Leg)	136' - 0'	0.000	0.1	1	1	1.000	1.000	4.000	0.008
(E) *&&* LDF7-50A(1-5/8") (13E+1P)	B	Yes	Ar (CfAe)	107' - 0'	-4.000	0.37	14	7	0.850 0.750	1.980		0.001
LightWAVE	B	Yes	Af (CfAe)	107' - 0'	-4.000	0.39	1	1	1.500	1.500	6.000	0.002
(E) *&&* FB-L98-002-XXX(3/8)	B	No	Ar (Leg)	97' - 0'	0.000	0.1	1	1	0.394	0.394		0.000
(E) WR-VG82ST-BRDA(5/8")	B	No	Ar (Leg)	97' - 0'	0.000	0.12	2	2	0.500	0.645		0.000
(E) *&&* FLC 12-50J(1/2")	B	No	Ar (Leg)	80' - 0'	0.000	0.05	1	1	0.500	0.640		0.000
(E) *&&* LDF7-50A(1-5/8") (12(1-5/8) + 1(1-1/4))	C	No	Ar (Leg)	117' - 0'	0.000	0.1	13	7	0.500	1.980		0.001
T-Brackets (Af)	C	No	Af (Leg)	117' - 0'	0.000	0.1	1	1	1.000	1.000	4.000	0.008
(E) *&&* FXL 780 PE(7/8)	A	Yes	Ar (CfAe)	87' - 0'	0.000	-0.1	6	6	0.850 0.750	1.090		0.000
(E) Feedline Ladder (Af)	A	Yes	Af (CfAe)	87' - 0'	0.000	-0.1	1	1	3.000	3.000	12.000	0.008
(E) Safety Line 3/8	C	Yes	Ar (CfAe)	136' - 0'	0.000	0.5	1	1	0.375	0.375		0.000
(E) *&&*												

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
&&							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136'-132'11"	A	0.000	0.000	0.000	0.000	0.000
		B	1.187	0.257	0.000	0.000	0.036
		C	1.283	0.257	0.000	0.000	0.001
T2	132'11"-130'	A	0.000	0.000	0.000	0.000	0.000
		B	1.123	0.243	0.000	0.000	0.034
		C	1.214	0.243	0.000	0.000	0.001
T3	130'-110'	A	23.456	2.000	0.000	0.000	0.277
		B	23.071	3.083	0.000	0.000	0.233
		C	16.410	2.250	0.000	0.000	0.138
T4	110'-95'3-1/4"	A	30.330	2.455	0.000	0.000	0.240
		B	33.824	3.921	0.000	0.000	0.335
		C	24.432	2.455	0.000	0.000	0.284
T5	95'3-1/4"-90'	A	10.854	0.878	0.000	0.000	0.086
		B	16.811	1.537	0.000	0.000	0.150
		C	12.210	0.878	0.000	0.000	0.102
T6	90'-80'	A	18.078	3.417	0.000	0.000	0.177
		B	25.566	2.917	0.000	0.000	0.285
		C	23.166	1.667	0.000	0.000	0.193
T7	80'-60'	A	35.260	8.333	0.000	0.000	0.370
		B	48.033	5.833	0.000	0.000	0.573
		C	47.398	3.333	0.000	0.000	0.386
T8	60'-40'	A	36.100	8.333	0.000	0.000	0.372
		B	48.873	5.833	0.000	0.000	0.573
		C	47.398	3.333	0.000	0.000	0.386
T9	40'-20'	A	36.100	8.333	0.000	0.000	0.372
		B	48.873	5.833	0.000	0.000	0.573
		C	47.398	3.333	0.000	0.000	0.386
T10	20'-0'	A	36.100	8.333	0.000	0.000	0.372
		B	48.873	5.833	0.000	0.000	0.573
		C	47.398	3.333	0.000	0.000	0.386

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136'-132'11"	A	0.888	0.000	0.000	0.000	0.000	0.000
		B		0.852	1.609	0.000	0.000	0.064
		C		1.404	1.609	0.000	0.000	0.005
T2	132'11"-130'	A	0.885	0.000	0.000	0.000	0.000	0.000
		B		0.805	1.522	0.000	0.000	0.060
		C		1.326	1.522	0.000	0.000	0.005
T3	130'-110'	A	0.876	6.854	30.440	0.000	0.000	0.804
		B		10.162	30.908	0.000	0.000	0.410
		C		11.206	20.357	0.000	0.000	0.361
T4	110'-95'3-1/4"	A	0.859	8.552	38.629	0.000	0.000	0.692
		B		12.336	45.920	0.000	0.000	0.925

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		11.818	29.904	0.000	0.000	0.711
T5	95'3-1/4"-90'	A	0.849	3.042	13.811	0.000	0.000	0.246
		B		6.605	21.839	0.000	0.000	0.476
		C		6.089	14.358	0.000	0.000	0.253
T6	90'-80'	A	0.840	5.474	27.071	0.000	0.000	0.393
		B		10.574	34.230	0.000	0.000	0.900
		C		11.480	27.221	0.000	0.000	0.478
T7	80'-60'	A	0.821	12.860	55.902	0.000	0.000	0.748
		B		25.350	63.311	0.000	0.000	1.812
		C		26.439	54.356	0.000	0.000	0.946
T8	60'-40'	A	0.788	14.050	56.439	0.000	0.000	0.752
		B		26.215	63.847	0.000	0.000	1.778
		C		25.790	54.212	0.000	0.000	0.931
T9	40'-20'	A	0.750	13.667	56.183	0.000	0.000	0.733
		B		25.448	63.592	0.000	0.000	1.738
		C		25.023	54.042	0.000	0.000	0.913
T10	20'-0'	A	0.750	13.667	56.183	0.000	0.000	0.733
		B		25.448	63.592	0.000	0.000	1.738
		C		25.023	54.042	0.000	0.000	0.913

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	136'-132'11"	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.004	0.096	0.013	0.075
T2	132'11"-130'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.011	0.204	0.000	0.000
T3	130'-110'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.060	1.047	0.000	0.000
T4	110'-95'3-1/4"	A	0.000	0.000	0.000	0.000
		B	1.224	5.177	0.000	0.000
		C	0.049	0.758	0.000	0.000
T5	95'3-1/4"-90'	A	0.000	0.000	0.000	0.000
		B	0.899	3.485	0.000	0.000
		C	0.022	0.303	0.000	0.000
T6	90'-80'	A	0.000	0.581	0.577	1.037
		B	0.000	1.152	1.327	2.057
		C	0.000	0.099	0.032	0.178
T7	80'-60'	A	0.000	1.362	1.159	2.075
		B	0.000	1.895	1.866	2.885
		C	0.000	0.161	0.046	0.245
T8	60'-40'	A	0.000	1.111	1.191	2.114
		B	0.000	1.549	1.917	2.947
		C	0.000	0.128	0.047	0.244
T9	40'-20'	A	0.000	0.946	1.076	1.893
		B	0.000	1.322	1.732	2.645
		C	0.000	0.106	0.042	0.211
T10	20'-0'	A	0.000	0.883	1.004	1.766
		B	0.000	1.234	1.616	2.468
		C	0.000	0.099	0.039	0.197

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	136'-132'11"	2.377	1.566	1.084	1.123
T2	132'11"-130'	2.815	1.871	1.000	0.963
T3	130'-110'	-0.030	-1.619	-0.284	-1.025
T4	110'-95'3-1/4"	0.418	1.056	-0.074	0.590
T5	95'3-1/4"-90'	2.136	1.896	1.085	1.140
T6	90'-80'	1.345	3.302	0.743	2.164
T7	80'-60'	1.610	4.854	1.085	3.367
T8	60'-40'	2.033	5.687	1.404	4.058
T9	40'-20'	2.528	6.802	1.778	4.951
T10	20'-0'	2.938	7.706	2.069	5.607

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
APXVSPP18-C-A20 w/ Mount Pipe (E)	A	From Leg	4.000 0' 1'	0.000	136'	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 (E)	B	From Leg	4.000 0' 1'	0.000	136'	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 (E)	C	From Leg	4.000 0' 1'	0.000	136'	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 (E)	A	From Leg	4.000 0' 0'	0.000	136'	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 (E)	B	From Leg	4.000 0' 0'	0.000	136'	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 (E)	C	From Leg	4.000 0' 0'	0.000	136'	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 Leg	4.000	0.000	136'	No Ice	1.127	0.533	0.022

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
(E)			0'			1/2" Ice	1.273	0.647	0.030
			0'			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 Leg	4.000	0.000	136'	No Ice	1.127	0.533	0.022
(E)			0'			1/2" Ice	1.273	0.647	0.030
			0'			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 Leg	4.000	0.000	136'	No Ice	1.127	0.533	0.022
(E)			0'			1/2" Ice	1.273	0.647	0.030
			0'			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) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Platform Mount [LP 405-1]	C	None		0.000	136'	No Ice	20.800	20.800	1.800
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
						2" Ice	50.000	50.000	2.864
						4" Ice	79.200	79.200	3.928
&&									
TME-800MHz 2X50W RRH	A	From Leg	4.000	0.000	134'	No Ice	2.401	2.254	0.064
W/FILTER			0'			1/2" Ice	2.613	2.460	0.086
(E)			-1'			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
TME-800MHz 2X50W RRH	B	From Leg	4.000	0.000	134'	No Ice	2.401	2.254	0.064
W/FILTER			0'			1/2" Ice	2.613	2.460	0.086
(E)			-1'			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
TME-800MHz 2X50W RRH	C	From Leg	4.000	0.000	134'	No Ice	2.401	2.254	0.064
W/FILTER			0'			1/2" Ice	2.613	2.460	0.086
(E)			-1'			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
TME-1900MHz RRH	A	From Leg	4.000	0.000	134'	No Ice	2.698	2.771	0.060
(65MHz)			0'			1/2" Ice	2.936	3.011	0.084
(E)			0'			1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
TME-1900MHz RRH	B	From Leg	4.000	0.000	134'	No Ice	2.698	2.771	0.060
(65MHz)			0'			1/2" Ice	2.936	3.011	0.084

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
(E)			0'			1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
TME-1900MHz RRH (65MHz)	C	From Leg	4.000 0'	0.000	134'	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084
(E)			0'			1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
(2) Pipe Mount [PM 601-3]	C	None		0.000	134'	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
&&									
(4) DB844H90E-XY w/ Mount Pipe	A	From Face	4.000 0'	0.000	127'	No Ice	3.299	4.921	0.032
						1/2" Ice	3.690	5.596	0.072
(AB)			0'			1" Ice	4.119	6.284	0.117
						2" Ice	5.007	7.712	0.228
						4" Ice	6.920	10.833	0.557
(4) DB844H90E-XY w/ Mount Pipe	B	From Face	4.000 0'	0.000	127'	No Ice	3.299	4.921	0.032
						1/2" Ice	3.690	5.596	0.072
(AB)			0'			1" Ice	4.119	6.284	0.117
						2" Ice	5.007	7.712	0.228
						4" Ice	6.920	10.833	0.557
(4) DB844H90E-XY w/ Mount Pipe	C	From Face	4.000 0'	0.000	127'	No Ice	3.299	4.921	0.032
						1/2" Ice	3.690	5.596	0.072
(AB)			0'			1" Ice	4.119	6.284	0.117
						2" Ice	5.007	7.712	0.228
						4" Ice	6.920	10.833	0.557
Sector Mount [SM 410-3]	C	None		0.000	127'	No Ice	23.960	23.960	1.100
(AB)						1/2" Ice	34.060	34.060	1.600
						1" Ice	44.160	44.160	2.099
						2" Ice	64.360	64.360	3.098
						4" Ice	104.760	104.760	5.095
Pipe Mount [PM 601-3]	C	None		0.000	127'	No Ice	4.390	4.390	0.195
(E-Mount Attachment)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
&&									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0'	0.000	117'	No Ice	6.825	5.642	0.112
						1/2" Ice	7.347	6.480	0.169
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0'	0.000	117'	No Ice	6.825	5.642	0.112
						1/2" Ice	7.347	6.480	0.169
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0'	0.000	117'	No Ice	6.825	5.642	0.112
						1/2" Ice	7.347	6.480	0.169
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0'	0.000	117'	No Ice	6.825	5.642	0.112
						1/2" Ice	7.347	6.480	0.169

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
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0'	0.000	117'	No Ice 1/2" Ice	6.825 7.347	5.642 6.480	0.112 0.169
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0'	0.000	117'	No Ice 1/2" Ice	6.825 7.347	5.642 6.480	0.112 0.169
(E)			2'			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
KRY 112 144/1	A	From Leg	4.000 0'	0.000	117'	No Ice 1/2" Ice	0.408 0.497	0.204 0.273	0.011 0.014
(E)			2'			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	4.000 0'	0.000	117'	No Ice 1/2" Ice	0.408 0.497	0.204 0.273	0.011 0.014
(E)			2'			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	4.000 0'	0.000	117'	No Ice 1/2" Ice	0.408 0.497	0.204 0.273	0.011 0.014
(E)			2'			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
Sector Mount [SM 410-3]	C	None		0.000	117'	No Ice	23.960	23.960	1.100
(E)						1/2" Ice	34.060	34.060	1.600
						1" Ice	44.160	44.160	2.099
						2" Ice	64.360	64.360	3.098
						4" Ice	104.760	104.760	5.095
Pipe Mount [PM 601-3]	C	None		0.000	117'	No Ice	4.390	4.390	0.195
(E-Mount Attachment)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
&&									
BXA-80063/4CF	A	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	5.161 5.545	2.248 2.547	0.010 0.038
(E)			0'			1" Ice	5.938	2.853	0.070
						2" Ice	6.750	3.488	0.148
						4" Ice	8.476	5.041	0.363
BXA-80063/4CF	B	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	5.161 5.545	2.248 2.547	0.010 0.038
(E)			0'			1" Ice	5.938	2.853	0.070
						2" Ice	6.750	3.488	0.148
						4" Ice	8.476	5.041	0.363
BXA-80063/4CF	C	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	5.161 5.545	2.248 2.547	0.010 0.038
(E)			0'			1" Ice	5.938	2.853	0.070
						2" Ice	6.750	3.488	0.148
						4" Ice	8.476	5.041	0.363
(2) FD9R6004/2C-3L	A	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	0.367 0.451	0.085 0.136	0.003 0.005
(E)			0'			1" Ice	0.543	0.196	0.009

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L (E)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L (E)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
DB-T1-6Z-8AB-0Z (E)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice	5.600	2.333	0.044
						1/2" Ice	5.915	2.558	0.080
						1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
HBXX-6516DS-A2M (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice	5.938	3.280	0.031
						1/2" Ice	6.350	3.610	0.066
						1" Ice	6.771	3.978	0.106
						2" Ice	7.638	4.774	0.201
						4" Ice	9.476	6.469	0.455
HBXX-6516DS-A2M (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice	5.938	3.280	0.031
						1/2" Ice	6.350	3.610	0.066
						1" Ice	6.771	3.978	0.106
						2" Ice	7.638	4.774	0.201
						4" Ice	9.476	6.469	0.455
HBXX-6516DS-A2M (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice	5.938	3.280	0.031
						1/2" Ice	6.350	3.610	0.066
						1" Ice	6.771	3.978	0.106
						2" Ice	7.638	4.774	0.201
						4" Ice	9.476	6.469	0.455
HBXX-6517DS-A2M (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice	8.738	5.243	0.041
						1/2" Ice	9.306	5.709	0.091
						1" Ice	9.882	6.183	0.148
						2" Ice	11.060	7.153	0.281
						4" Ice	13.521	9.231	0.631
HBXX-6517DS-A2M (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice	8.738	5.243	0.041
						1/2" Ice	9.306	5.709	0.091
						1" Ice	9.882	6.183	0.148
						2" Ice	11.060	7.153	0.281
						4" Ice	13.521	9.231	0.631
HBXX-6517DS-A2M (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice	8.738	5.243	0.041
						1/2" Ice	9.306	5.709	0.091
						1" Ice	9.882	6.183	0.148
						2" Ice	11.060	7.153	0.281
						4" Ice	13.521	9.231	0.631
LNX-6514DS-A1M (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice	8.411	5.405	0.039
						1/2" Ice	8.964	5.863	0.089
						1" Ice	9.525	6.327	0.146
						2" Ice	10.673	7.278	0.278
						4" Ice	13.074	9.433	0.626
LNX-6514DS-A1M (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice	8.411	5.405	0.039
						1/2" Ice	8.964	5.863	0.089
						1" Ice	9.525	6.327	0.146
						2" Ice	10.673	7.278	0.278
						4" Ice	13.074	9.433	0.626

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)
LNX-6514DS-A1M (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.411 8.964 9.525 10.673 13.074	5.405 5.863 6.327 7.278 9.433	0.039 0.089 0.146 0.278 0.626
RRH2X60-AWS (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-PCS (P)	A	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (P)	B	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (P)	C	From Leg	4.000 0' 0'	0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
Sector Mount [SM 307-3] (E-4 M. Pipes / Sector)	C	None		0.000	107'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	26.220 36.280 46.340 66.460 106.700	26.220 36.280 46.340 66.460 106.700	1.620 2.148 2.676 3.733 5.845
&& AM-X-CD-16-65-00T-RET	A	From Leg	3.000	0.000	97'	No Ice	8.498	6.304	0.074

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
w/ Mount Pipe			0'			1/2" Ice	9.149	7.479	0.139
(E)			0'			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-14-65-00T-RET	B	From Leg	3.000	0.000	97'	No Ice	5.744	4.015	0.035
w/ Mount Pipe			0'			1/2" Ice	6.198	4.633	0.080
(E)			0'			1" Ice	6.661	5.276	0.131
						2" Ice	7.618	6.678	0.254
						4" Ice	9.668	9.744	0.610
SBNH-1D6565C w/ Mount	C	From Leg	3.000	0.000	97'	No Ice	11.683	9.842	0.094
Pipe			0'			1/2" Ice	12.404	11.366	0.183
(E)			0'			1" Ice	13.135	12.914	0.283
						2" Ice	14.601	15.267	0.517
						4" Ice	17.875	20.139	1.162
7770.00 w/ Mount Pipe	A	From Leg	3.000	0.000	97'	No Ice	6.119	4.254	0.055
(E)			0'			1/2" Ice	6.626	5.014	0.103
			0'			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	B	From Leg	3.000	0.000	97'	No Ice	6.119	4.254	0.055
(E)			0'			1/2" Ice	6.626	5.014	0.103
			0'			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	C	From Leg	3.000	0.000	97'	No Ice	6.119	4.254	0.055
(E)			0'			1/2" Ice	6.626	5.014	0.103
			0'			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) RRUS 11	A	From Face	0.500	0.000	97'	No Ice	3.249	1.373	0.048
(E-as per photo)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	B	From Face	0.500	0.000	97'	No Ice	3.249	1.373	0.048
(E-as per photo)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	C	From Face	0.500	0.000	97'	No Ice	3.249	1.373	0.048
(E-as per photo)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) LGP21401	A	From Leg	3.000	0.000	97'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	B	From Leg	3.000	0.000	97'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	C	From Leg	3.000	0.000	97'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
DC6-48-60-18-8F	A	From Leg	3.000	0.000	97'	No Ice	1.266	1.266	0.020
(E)			0'			1/2" Ice	1.456	1.456	0.035
			0'			1" Ice	1.658	1.658	0.053
						2" Ice	2.093	2.093	0.095
						4" Ice	3.098	3.098	0.215
4' x 3" Pipe Mount	A	From Leg	1.500	0.000	97'	No Ice	1.000	1.000	0.029
(E)			0'			1/2" Ice	1.248	1.248	0.038
			0'			1" Ice	1.505	1.505	0.050
						2" Ice	2.046	2.046	0.083
						4" Ice	3.422	3.422	0.190
4' x 3" Pipe Mount	B	From Leg	1.500	0.000	97'	No Ice	1.000	1.000	0.029
(E)			0'			1/2" Ice	1.248	1.248	0.038
			0'			1" Ice	1.505	1.505	0.050
						2" Ice	2.046	2.046	0.083
						4" Ice	3.422	3.422	0.190
4' x 3" Pipe Mount	C	From Leg	1.500	0.000	97'	No Ice	1.000	1.000	0.029
(E)			0'			1/2" Ice	1.248	1.248	0.038
			0'			1" Ice	1.505	1.505	0.050
						2" Ice	2.046	2.046	0.083
						4" Ice	3.422	3.422	0.190
T-Arm Mount [TA 702-3]	C	None		0.000	97'	No Ice	5.640	5.640	0.339
(E)						1/2" Ice	6.550	6.550	0.429
						1" Ice	7.460	7.460	0.519
						2" Ice	9.280	9.280	0.699
						4" Ice	12.920	12.920	1.059
Pipe Mount [PM 601-3]	C	None		0.000	97'	No Ice	4.390	4.390	0.195
(E-Mount Attachment)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
&&									
800 10504 w/ Mount Pipe	A	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
800 10504 w/ Mount Pipe	B	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
800 10504 w/ Mount Pipe	C	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
860 10118	A	From Leg	4.000	0.000	87'	No Ice	0.170	0.140	0.000
(E)			0'			1/2" Ice	0.238	0.206	0.002
			0'			1" Ice	0.316	0.281	0.004
						2" Ice	0.496	0.456	0.013
						4" Ice	0.960	0.910	0.050
860 10118	B	From Leg	4.000	0.000	87'	No Ice	0.170	0.140	0.000
(E)			0'			1/2" Ice	0.238	0.206	0.002
			0'			1" Ice	0.316	0.281	0.004
						2" Ice	0.496	0.456	0.013

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	0.960	0.910	0.050
860 10118	C	From Leg	4.000	0.000	87'	No Ice	0.170	0.140	0.000
(E)			0'			1/2" Ice	0.238	0.206	0.002
			0'			1" Ice	0.316	0.281	0.004
						2" Ice	0.496	0.456	0.013
						4" Ice	0.960	0.910	0.050
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			1'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			1'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			1'			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Sector Mount [SM 104-3]	C	None		0.000	87'	No Ice	30.020	30.020	0.953
(E)						1/2" Ice	40.480	40.480	1.405
						1" Ice	50.940	50.940	1.857
						2" Ice	71.860	71.860	2.761
						4" Ice	113.700	113.700	4.569
&&									
GPS_A	C	From Leg	3.000	20.000	80'	No Ice	0.297	0.297	0.001
(E)			0'			1/2" Ice	0.374	0.374	0.005
			1'			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	80'	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
&&									
GPS_A	B	From Leg	3.000	20.000	72'	No Ice	0.297	0.297	0.001
(E)			0'			1/2" Ice	0.374	0.374	0.005
			0'			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
GPS_A	C	From Leg	3.000	20.000	72'	No Ice	0.297	0.297	0.001
(E)			0'			1/2" Ice	0.374	0.374	0.005
			0'			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	72'	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	72'	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121

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	3.170	7.030	0.177

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	1092.711	2586.482	0.681	0.489	7.588	17.962	5.367
Pirod 105217	2296.236	4895.600	0.587	0.938	7.973	16.999	5.301
Pirod 105218	2425.314	4973.062	0.722	0.901	8.421	17.268	7.216
Pirod 105218	2425.314	4788.525	0.722	0.833	8.421	16.627	7.216
Pirod 105219	2597.910	5128.184	1.086	0.883	9.021	17.806	9.425

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

Comb. No.	Description
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	136 - 132.917	Leg	Max Tension	6	0.020	0.000	0.000
			Max. Compression	19	-1.598	-0.036	-0.020
			Max. Mx	11	-0.927	0.156	-0.001
			Max. My	2	-0.979	-0.001	0.158
			Max. Vy	5	-0.651	0.000	0.000
			Max. Vx	2	0.653	0.000	0.000
		Diagonal	Max Tension	5	1.174	0.000	0.000
			Max. Compression	5	-1.227	0.000	0.000
			Max. Mx	14	-0.038	0.003	0.000
			Max. Vy	14	0.003	0.000	0.000
		Top Girt	Max Tension	4	0.754	0.000	0.000
			Max. Compression	10	-0.754	-0.033	0.000
			Max. Mx	21	-0.103	-0.042	0.000
			Max. My	2	0.374	-0.012	-0.000
			Max. Vy	21	0.032	-0.042	0.000
			Max. Vx	6	-0.000	0.000	0.000
T2	132.917 - 130	Leg	Max Tension	8	3.119	0.003	0.337
			Max. Compression	6	-5.475	-0.201	-0.116
			Max. Mx	11	-4.828	-0.332	0.019
			Max. My	2	-4.142	-0.004	-0.345
			Max. Vy	5	1.028	-0.224	-0.011
			Max. Vx	2	-1.066	0.003	0.232
		Diagonal	Max Tension	11	1.310	0.000	0.000
			Max. Compression	11	-1.403	0.000	0.000
			Max. Mx	21	0.263	-0.002	-0.000
			Max. My	11	1.302	-0.001	-0.000
			Max. Vy	21	0.004	-0.002	-0.000
			Max. Vx	11	-0.000	0.000	0.000
		Secondary Horizontal	Max Tension	6	0.095	0.000	0.000
			Max. Compression	6	-0.095	0.000	0.000
			Max. Mx	14	0.032	0.007	0.000
			Max. Vy	14	-0.007	0.000	0.000
		Top Girt	Max Tension	10	0.332	0.000	0.000
			Max. Compression	12	-0.226	0.000	0.000
			Max. Mx	14	0.075	0.008	0.000
			Max. Vy	14	0.008	0.000	0.000
		Bottom Girt	Max Tension	8	0.616	0.000	0.000
			Max. Compression	6	-0.549	0.000	0.000
			Max. Mx	14	0.056	0.008	0.000
			Max. Vy	14	0.008	0.000	0.000
T3	130 - 110	Leg	Max Tension	4	34.935	1.365	-0.014

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	6	-41.196	0.116	0.005
			Max. Mx	2	-37.768	-1.378	0.005
			Max. My	3	-2.901	-0.017	1.153
			Max. Vy	2	-2.992	0.117	-0.000
			Max. Vx	9	-2.492	0.001	0.096
		Diagonal	Max Tension	7	3.859	0.000	0.000
			Max. Compression	13	-3.900	0.000	0.000
			Max. Mx	20	1.146	-0.003	-0.000
			Max. My	11	-2.895	-0.001	-0.001
			Max. Vy	20	0.006	-0.003	-0.000
			Max. Vx	11	0.000	-0.001	-0.001
		Horizontal	Max Tension	8	0.523	0.000	0.000
			Max. Compression	2	-0.385	0.000	0.000
			Max. Mx	14	0.152	0.008	0.000
			Max. Vy	14	-0.007	0.000	0.000
		Top Girt	Max Tension	2	0.499	0.000	0.000
			Max. Compression	12	-0.488	0.000	0.000
			Max. Mx	14	-0.001	0.008	0.000
			Max. Vy	14	-0.008	0.000	0.000
		Bottom Girt	Max Tension	12	1.802	0.000	0.000
			Max. Compression	10	-1.770	0.000	0.000
			Max. Mx	14	0.041	0.010	0.000
			Max. Vy	14	-0.009	0.000	0.000
T4	110 - 95.2708	Leg	Max Tension	8	71.738	-0.204	-0.015
			Max. Compression	2	-81.813	0.009	0.009
			Max. Mx	2	-44.316	2.092	-0.008
			Max. My	9	-3.068	-0.026	1.759
			Max. Vy	2	-2.963	2.092	-0.008
			Max. Vx	9	-2.496	-0.026	1.759
		Diagonal	Max Tension	3	5.383	0.000	0.000
			Max. Compression	9	-5.402	0.000	0.000
			Max. Mx	4	4.531	-0.006	-0.000
			Max. My	5	-4.231	-0.000	0.001
			Max. Vy	15	0.008	-0.005	-0.000
			Max. Vx	5	-0.000	-0.000	0.001
		Horizontal	Max Tension	8	0.936	0.000	0.000
			Max. Compression	2	-0.738	0.000	0.000
			Max. Mx	14	0.166	0.011	0.000
			Max. Vy	14	-0.009	0.000	0.000
		Top Girt	Max Tension	10	1.406	0.000	0.000
			Max. Compression	12	-1.367	0.000	0.000
			Max. Mx	14	0.025	0.012	0.000
			Max. Vy	14	-0.010	0.000	0.000
T5	95.2708 - 90	Leg	Max Tension	8	92.504	0.814	0.009
			Max. Compression	2	-103.914	3.426	0.025
			Max. Mx	2	-103.914	3.426	0.025
			Max. My	7	-5.434	0.023	-1.772
			Max. Vy	2	-7.247	3.426	0.025
			Max. Vx	5	-3.465	0.013	1.764
		Diagonal	Max Tension	3	6.206	0.000	0.000
			Max. Compression	9	-6.313	0.000	0.000
			Max. Mx	2	4.887	-0.007	-0.000
			Max. My	8	4.917	-0.006	0.000
			Max. Vy	15	0.008	-0.006	0.000
			Max. Vx	8	0.000	-0.006	0.000
		Secondary Horizontal	Max Tension	2	1.800	0.000	0.000
			Max. Compression	2	-1.800	0.000	0.000
			Max. Mx	14	0.174	0.026	0.000
			Max. Vy	14	0.021	0.000	0.000
		Bottom Girt	Max Tension	8	1.321	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	2	-1.213	0.000	0.000
			Max. Mx	14	0.092	0.014	0.000
			Max. Vy	14	-0.011	0.000	0.000
T6	90 - 80	Leg	Max Tension	8	98.918	-3.378	-0.025
			Max. Compression	2	-110.568	4.831	-0.020
			Max. Mx	8	98.447	-5.380	0.024
			Max. My	3	-5.559	-0.304	-8.783
			Max. Vy	12	0.424	-5.368	-0.032
			Max. Vx	3	0.936	-0.304	-8.783
		Diagonal	Max Tension	8	7.065	0.124	-0.025
			Max. Compression	2	-7.706	0.000	0.000
			Max. Mx	8	6.861	0.124	0.023
			Max. My	3	-6.599	-0.103	0.033
			Max. Vy	7	-0.026	0.111	0.027
			Max. Vx	3	-0.007	0.000	0.000
T7	80 - 60	Leg	Max Tension	8	137.370	-5.762	-0.004
			Max. Compression	2	-152.639	5.963	-0.002
			Max. Mx	8	137.157	-5.982	0.003
			Max. My	3	-6.448	-0.304	-8.783
			Max. Vy	2	-0.213	5.958	0.001
			Max. Vx	13	0.445	-0.303	8.730
		Diagonal	Max Tension	11	6.920	0.065	-0.003
			Max. Compression	5	-6.763	0.000	0.000
			Max. Mx	2	6.254	0.086	0.004
			Max. My	13	5.811	0.064	0.007
			Max. Vy	19	-0.021	0.048	-0.006
			Max. Vx	26	-0.002	0.000	0.000
T8	60 - 40	Leg	Max Tension	8	166.415	-5.554	0.004
			Max. Compression	2	-184.894	5.458	-0.005
			Max. Mx	8	152.899	-5.982	0.003
			Max. My	9	-8.245	-0.019	5.588
			Max. Vy	12	-0.131	-5.956	0.026
			Max. Vx	9	0.143	-0.019	5.588
		Diagonal	Max Tension	11	5.924	0.000	0.000
			Max. Compression	11	-5.942	0.000	0.000
			Max. Mx	2	5.014	0.100	-0.005
			Max. My	10	4.774	0.100	0.007
			Max. Vy	19	-0.029	0.063	-0.006
			Max. Vx	19	0.002	0.000	0.000
T9	40 - 20	Leg	Max Tension	8	190.508	-4.864	0.004
			Max. Compression	2	-212.208	6.529	-0.024
			Max. Mx	2	-212.208	6.529	-0.024
			Max. My	9	-10.395	-0.141	5.827
			Max. Vy	25	0.466	-4.602	0.029
			Max. Vx	9	0.262	-0.141	5.827
		Diagonal	Max Tension	11	5.644	0.000	0.000
			Max. Compression	11	-5.694	0.000	0.000
			Max. Mx	2	4.685	0.090	-0.003
			Max. My	23	1.941	0.067	0.008
			Max. Vy	21	0.032	0.058	-0.007
			Max. Vx	23	-0.002	0.000	0.000
T10	20 - 0	Leg	Max Tension	8	211.165	-5.017	0.008
			Max. Compression	2	-236.886	0.000	-0.000
			Max. Mx	2	-225.738	6.529	-0.024
			Max. My	9	-12.092	-0.344	8.724
			Max. Vy	25	-0.796	-4.602	0.029
			Max. Vx	9	0.967	-0.344	8.724
		Diagonal	Max Tension	4	6.783	0.000	0.000
			Max. Compression	10	-7.412	0.000	0.000
			Max. Mx	2	3.980	0.123	-0.017
			Max. My	9	5.796	0.104	0.019

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	21	0.048	0.108	0.009
			Max. Vx	9	-0.003	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	244.830	20.392	-11.420
	Max. H_x	10	244.830	20.392	-11.420
	Max. H_z	4	-216.254	-18.122	10.151
	Min. Vert	4	-216.254	-18.122	10.151
	Min. H_x	4	-216.254	-18.122	10.151
	Min. H_z	10	244.830	20.392	-11.420
Leg B	Max. Vert	6	244.994	-20.362	-11.494
	Max. H_x	12	-216.272	18.094	10.216
	Max. H_z	12	-216.272	18.094	10.216
	Min. Vert	12	-216.272	18.094	10.216
	Min. H_x	6	244.994	-20.362	-11.494
	Min. H_z	6	244.994	-20.362	-11.494
Leg A	Max. Vert	2	245.095	0.078	23.432
	Max. H_x	4	126.664	0.235	11.987
	Max. H_z	2	245.095	0.078	23.432
	Min. Vert	8	-217.799	-0.071	-20.863
	Min. H_x	11	11.926	-0.218	1.045
	Min. H_z	8	-217.799	-0.071	-20.863

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	36.973	0.000	0.000	5.466	-0.508	0.000
Dead+Wind 0 deg - No Ice	36.973	-0.008	-33.742	-2822.198	0.129	1.869
Dead+Wind 30 deg - No Ice	36.973	16.487	-28.687	-2415.093	-1390.701	4.966
Dead+Wind 60 deg - No Ice	36.973	28.388	-16.455	-1386.297	-2399.713	6.742
Dead+Wind 90 deg - No Ice	36.973	32.988	0.008	6.103	-2781.997	6.876
Dead+Wind 120 deg - No Ice	36.973	29.103	16.878	1419.850	-2437.619	5.252
Dead+Wind 150 deg - No Ice	36.973	16.501	28.695	2426.662	-1391.803	1.910
Dead+Wind 180 deg - No Ice	36.973	0.008	32.925	2790.096	-1.144	-1.730
Dead+Wind 210 deg - No Ice	36.973	-16.487	28.687	2426.025	1389.686	-4.966
Dead+Wind 240 deg - No Ice	36.973	-29.095	16.864	1418.747	2435.967	-7.121
Dead+Wind 270 deg - No Ice	36.973	-32.988	-0.008	4.830	2780.982	-6.876
Dead+Wind 300 deg - No Ice	36.973	-28.396	-16.470	-1387.399	2399.334	-5.012
Dead+Wind 330 deg - No Ice	36.973	-16.501	-28.695	-2415.729	1390.788	-1.910
Dead+Ice+Temp	75.720	0.000	0.000	18.788	-8.057	0.000
Dead+Wind 0 deg+Ice+Temp	75.720	-0.006	-11.474	-905.729	-7.559	0.416
Dead+Wind 30 deg+Ice+Temp	75.720	5.502	-9.566	-762.199	-457.048	1.240
Dead+Wind 60 deg+Ice+Temp	75.720	9.391	-5.436	-426.772	-777.473	1.733
Dead+Wind 90 deg+Ice+Temp	75.720	11.015	0.006	19.286	-906.901	1.842
Dead+Wind 120 deg+Ice+Temp	75.720	9.910	5.742	481.477	-806.147	1.502
Dead+Wind 150 deg+Ice+Temp	75.720	5.512	9.571	800.272	-457.910	0.602
Dead+Wind 180 deg+Ice+Temp	75.720	0.006	10.881	910.770	-8.555	-0.353

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 210 deg+Ice+Temp	75.720	-5.502	9.566	799.774	440.933	-1.240
Dead+Wind 240 deg+Ice+Temp	75.720	-9.905	5.732	480.615	789.534	-1.918
Dead+Wind 270 deg+Ice+Temp	75.720	-11.015	-0.006	18.290	890.786	-1.842
Dead+Wind 300 deg+Ice+Temp	75.720	-9.397	-5.445	-427.634	761.856	-1.380
Dead+Wind 330 deg+Ice+Temp	75.720	-5.512	-9.571	-762.697	441.796	-0.602
Dead+Wind 0 deg - Service	36.973	-0.003	-11.675	-972.964	-0.287	0.647
Dead+Wind 30 deg - Service	36.973	5.705	-9.926	-832.097	-481.543	1.718
Dead+Wind 60 deg - Service	36.973	9.823	-5.694	-476.113	-830.682	2.333
Dead+Wind 90 deg - Service	36.973	11.415	0.003	5.686	-962.961	2.379
Dead+Wind 120 deg - Service	36.973	10.070	5.840	494.872	-843.799	1.817
Dead+Wind 150 deg - Service	36.973	5.710	9.929	843.250	-481.925	0.661
Dead+Wind 180 deg - Service	36.973	0.003	11.393	969.006	-0.728	-0.598
Dead+Wind 210 deg - Service	36.973	-5.705	9.926	843.030	480.528	-1.718
Dead+Wind 240 deg - Service	36.973	-10.067	5.835	494.491	842.563	-2.464
Dead+Wind 270 deg - Service	36.973	-11.415	-0.003	5.246	961.946	-2.379
Dead+Wind 300 deg - Service	36.973	-9.826	-5.699	-476.494	829.887	-1.734
Dead+Wind 330 deg - Service	36.973	-5.710	-9.929	-832.318	480.910	-0.661

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	-36.973	0.000	0.000	36.973	0.000	0.000%
2	-0.008	-36.973	-33.742	0.008	36.973	33.742	0.000%
3	16.487	-36.973	-28.687	-16.487	36.973	28.687	0.000%
4	28.388	-36.973	-16.455	-28.388	36.973	16.455	0.000%
5	32.988	-36.973	0.008	-32.988	36.973	-0.008	0.000%
6	29.103	-36.973	16.878	-29.103	36.973	-16.878	0.000%
7	16.501	-36.973	28.695	-16.501	36.973	-28.695	0.000%
8	0.008	-36.973	32.925	-0.008	36.973	-32.925	0.000%
9	-16.487	-36.973	28.687	16.487	36.973	-28.687	0.000%
10	-29.095	-36.973	16.864	29.095	36.973	-16.864	0.000%
11	-32.988	-36.973	-0.008	32.988	36.973	0.008	0.000%
12	-28.396	-36.973	-16.470	28.396	36.973	16.470	0.000%
13	-16.501	-36.973	-28.695	16.501	36.973	28.695	0.000%
14	0.000	-75.720	0.000	0.000	75.720	-0.000	0.000%
15	-0.006	-75.720	-11.474	0.006	75.720	11.474	0.000%
16	5.502	-75.720	-9.566	-5.502	75.720	9.566	0.000%
17	9.391	-75.720	-5.436	-9.391	75.720	5.436	0.000%
18	11.015	-75.720	0.006	-11.015	75.720	-0.006	0.000%
19	9.910	-75.720	5.742	-9.910	75.720	-5.742	0.000%
20	5.512	-75.720	9.571	-5.512	75.720	-9.571	0.000%
21	0.006	-75.720	10.881	-0.006	75.720	-10.881	0.000%
22	-5.502	-75.720	9.566	5.502	75.720	-9.566	0.000%
23	-9.905	-75.720	5.732	9.905	75.720	-5.732	0.000%
24	-11.015	-75.720	-0.006	11.015	75.720	0.006	0.000%
25	-9.397	-75.720	-5.445	9.397	75.720	5.445	0.000%
26	-5.512	-75.720	-9.571	5.512	75.720	9.571	0.000%
27	-0.003	-36.973	-11.675	0.003	36.973	11.675	0.000%
28	5.705	-36.973	-9.926	-5.705	36.973	9.926	0.000%
29	9.823	-36.973	-5.694	-9.823	36.973	5.694	0.000%
30	11.415	-36.973	0.003	-11.415	36.973	-0.003	0.000%
31	10.070	-36.973	5.840	-10.070	36.973	-5.840	0.000%
32	5.710	-36.973	9.929	-5.710	36.973	-9.929	0.000%
33	0.003	-36.973	11.393	-0.003	36.973	-11.393	0.000%
34	-5.705	-36.973	9.926	5.705	36.973	-9.926	0.000%
35	-10.067	-36.973	5.835	10.067	36.973	-5.835	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
36	-11.415	-36.973	-0.003	11.415	36.973	0.003	0.000%
37	-9.826	-36.973	-5.699	9.826	36.973	5.699	0.000%
38	-5.710	-36.973	-9.929	5.710	36.973	9.929	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 132.917	6.104	31	0.400	0.005
T2	132.917 - 130	5.843	31	0.400	0.005
T3	130 - 110	5.585	31	0.398	0.005
T4	110 - 95.2708	3.913	31	0.366	0.006
T5	95.2708 - 90	2.803	31	0.314	0.007
T6	90 - 80	2.454	31	0.286	0.008
T7	80 - 60	1.874	31	0.244	0.008
T8	60 - 40	0.991	31	0.160	0.006
T9	40 - 20	0.422	31	0.099	0.004
T10	20 - 0	0.101	31	0.042	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSPP18-C-A20 w/ Mount Pipe	31	6.104	0.400	0.005	32324
134'	TME-800MHz 2X50W RRH W/FILTER	31	5.936	0.400	0.005	32324
127'	(4) DB844H90E-XY w/ Mount Pipe	31	5.322	0.396	0.005	23341
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	31	4.478	0.381	0.005	29372
107'	BXA-80063/4CF	31	3.676	0.359	0.006	25422
97'	AM-X-CD-16-65-00T-RET w/ Mount Pipe	31	2.924	0.322	0.007	11818
87'	800 10504 w/ Mount Pipe	31	2.269	0.272	0.008	11318
80'	GPS_A	31	1.874	0.244	0.008	12789
72'	GPS_A	31	1.479	0.210	0.008	13656

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 132.917	17.642	2	1.156	0.015
T2	132.917 - 130	16.888	2	1.155	0.015
T3	130 - 110	16.144	2	1.151	0.015
T4	110 - 95.2708	11.309	2	1.059	0.016
T5	95.2708 - 90	8.099	2	0.908	0.021

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	90 - 80	7.091	2	0.826	0.023
T7	80 - 60	5.415	2	0.705	0.024
T8	60 - 40	2.863	2	0.461	0.017
T9	40 - 20	1.219	2	0.287	0.011
T10	20 - 0	0.292	2	0.121	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVSPP18-C-A20 w/ Mount Pipe	2	17.642	1.156	0.015	11213
134'	TME-800MHz 2X50W RRH W/FILTER	2	17.156	1.156	0.015	11213
127'	(4) DB844H90E-XY w/ Mount Pipe	2	15.382	1.143	0.014	8102
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	12.944	1.103	0.015	10203
107'	BXA-80063/4CF	2	10.623	1.037	0.017	8821
97'	AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	8.450	0.932	0.021	4097
87'	800 10504 w/ Mount Pipe	2	6.557	0.786	0.023	3920
80'	GPS_A	2	5.415	0.705	0.024	4421
72'	GPS_A	2	4.274	0.607	0.022	4722

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	132.917	Leg	A325N	0.625	5	1.095	12.885	0.085 ✔	1.333	Bolt DS
T3	130	Leg	A325N	0.750	5	8.239	18.555	0.444 ✔	1.333	Bolt DS
T5	95.2708	Leg	A325N	1.000	6	15.417	34.466	0.447 ✔	1.333	Bolt Tension
T6	90	Leg	A325N	1.000	6	16.486	34.557	0.477 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.000	1	7.065	8.428	0.838 ✔	1.333	Member Block Shear
T7	80	Leg	A325N	1.000	6	22.895	34.557	0.663 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.000	1	6.920	7.748	0.893 ✔	1.333	Member Block Shear
T8	60	Leg	A325N	1.000	6	27.736	34.557	0.803 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.000	1	5.924	8.428	0.703 ✔	1.333	Member Block Shear
T9	40	Leg	A325N	1.000	6	31.751	34.557	0.919 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.000	1	5.644	8.428	0.670 ✔	1.333	Member Block Shear
T10	20	Leg	A687	1.250	6	35.194	60.746	0.579 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.250	1	6.783	14.953	0.454 ✔	1.333	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	1 1/2	3'1"	3'1"	98.7 K=1.00	15.013	1.767	-1.565	26.530	0.059* ✔
T2	132.917 - 130	1 1/2	2'11"	1'2-1/4"	38.0 K=1.00	26.110	1.767	-5.475	46.139	0.119 ✔
T3	130 - 110	2	20'1/32"	2'4-1/2"	57.0 K=1.00	23.222	3.142	-41.196	72.954	0.565 ✔
T4	110 - 95.2708	2 1/4	14'8-25/32"	2'4-1/8"	50.0 K=1.00	24.350	3.976	-81.813	96.816	0.845 ✔
T5	95.2708 - 90	2 1/4	5'3-1/4"	1'2-1/8"	25.1 K=1.00	27.734	3.976	-103.914	110.274	0.942 ✔
T6	90 - 80	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	10'7/32"	10'7/32"	37.6 K=1.00	26.164	5.367	-110.568	140.433	0.787 ✔
T7	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8 K=1.00	26.132	5.301	-152.639	138.539	1.102 ✔
T8	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	26.848	7.216	-184.894	193.727	0.954 ✔
T9	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	26.848	7.216	-212.208	193.727	1.095 ✔
T10	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4 K=1.00	27.351	9.425	-236.886	257.781	0.919 ✔

* DL controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T6	90 - 80	0.5	1'5-5/8"	120.0	10.373	0.196	0.938	2.280	0.411 ✔
T7	80 - 60	0.5	1'5-21/32"	120.0	10.279	0.196	0.425	2.259	0.188 ✔
T8	60 - 40	0.5	1'5-1/2"	119.0	10.423	0.196	0.156	2.290	0.068 ✔
T9	40 - 20	0.5	1'5-1/2"	119.0	10.423	0.196	0.466	2.290	0.204

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T10	20 - 0	0.625	1'5-11/32"	94.4	13.671	0.307	0.969	4.694	0.206 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	3/4	3'8-3/32"	3'6-23/32"	159.5 K=0.70	5.870	0.442	-1.227	2.593	0.473 ✓
T2	132.917 - 130	3/4	4'7-13/16"	2'3-1/32"	129.8 K=0.90	8.865	0.442	-1.403	3.916	0.358 ✓
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	120.9 K=0.90	10.224	0.601	-3.900	6.148	0.634 ✓
T4	110 - 95.2708	1	5'4-23/32"	2'7-5/16"	112.7 K=0.90	11.750	0.785	-5.402	9.228	0.585 ✓
T5	95.2708 - 90	1	5'5-27/32"	2'7-27/32"	114.7 K=0.90	11.358	0.785	-6.313	8.920	0.708 ✓
T6	90 - 80	L3x3x3/16	11'5"	4'11-25/32"	105.2 K=1.05	12.113	1.090	-7.706	13.203	0.584 ✓
T7	80 - 60	L2 1/2x2 1/2x3/16	12'6-1/32"	5'7-17/32"	136.4 K=1.00	8.025	0.902	-6.233	7.238	0.861 ✓
T8	60 - 40	L3x3x3/16	13'9-9/16"	6'3-15/16"	127.4 K=1.00	9.200	1.090	-5.749	10.028	0.573 ✓
T9	40 - 20	L3x3x3/16	15'2-29/32"	7'31/32"	142.6 K=1.00	7.345	1.090	-5.694	8.006	0.711 ✓
T10	20 - 0	L3x3x5/16	16'9-5/8"	7'10-3/32"	159.7 K=1.00	5.853	1.780	-7.412	10.418	0.711 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T3	130 - 110	3/4	4'4-7/16"	4'2-7/16"	188.3 K=0.70	4.214	0.442	-0.385	1.862	0.207 ✓
T4	110 - 95.2708	7/8	4'9-3/16"	4'6-15/16"	175.8 K=0.70	4.834	0.601	-0.738	2.907	0.254 ✓

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	132.917 - 130	3/4	4'	3'10-1/2"	173.6 K=0.70	4.955	0.442	-0.095	2.189	0.043 ✔
T5	95.2708 - 90	1 1/2	4'11-9/16"	4'9-5/16"	107.0 K=0.70	13.053	1.767	-1.800	23.066	0.078 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	5x3/8	4'	3'10-1/2"	429.5 K=1.00	0.809	1.875	-0.754	1.518	0.497 ✔
		KL/R > 200 (C) - 4								
T2	132.917 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	6.744	0.601	-0.226	4.056	0.056 ✔
T3	130 - 110	7/8	4'5/32"	3'10-5/32"	147.7 K=0.70	6.847	0.601	-0.488	4.117	0.118 ✔
T4	110 - 95.2708	1	4'6-7/32"	4'3-31/32"	145.5 K=0.70	7.055	0.785	-1.367	5.541	0.247 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	132.917 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	6.744	0.601	-0.549	4.056	0.135 ✔
T3	130 - 110	7/8	4'5-27/32"	4'3-27/32"	165.9 K=0.70	5.424	0.601	-1.770	3.262	0.543 ✔
T5	95.2708 - 90	1	4'11-27/32"	4'9-19/32"	161.3 K=0.70	5.741	0.785	-1.213	4.509	0.269 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	1 1/2	3'1"	3'1"	98.7	30.000	1.767	0.016	53.014	0.000* ✔
T2	132.917 - 130	1 1/2	2'11"	6-1/2"	17.3	32.500	0.773	3.119	25.130	0.124 ✔

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 $\frac{P}{P_a}$
T3	130 - 110	2	20'1/32"	6"	12.0	32.500	1.562	34.935	50.780	0.688 ✔
T4	110 - 95.2708	2 1/4	14'8-25/32"	2'4-1/8"	50.0	30.000	3.976	71.738	119.282	0.601 ✔
T5	95.2708 - 90	2 1/4	5'3-1/4"	7"	12.4	30.000	3.976	92.504	119.282	0.776 ✔
T6	90 - 80	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	10'7/32"	10'7/32"	37.6	30.000	5.367	98.918	161.021	0.614 ✔
T7	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8	30.000	5.301	137.370	159.043	0.864 ✔
T8	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4	30.000	7.216	166.415	216.475	0.769 ✔
T9	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4	30.000	7.216	190.508	216.475	0.880 ✔
T10	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4	30.000	9.425	211.165	282.743	0.747 ✔

* DL controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T6	90 - 80	0.5	1'5-5/8"	120.0	10.373	0.196	0.938	2.280	0.411 ✔
T7	80 - 60	0.5	1'5-21/32"	120.0	10.279	0.196	0.425	2.259	0.188 ✔
T8	60 - 40	0.5	1'5-1/2"	119.0	10.423	0.196	0.156	2.290	0.068 ✔
T9	40 - 20	0.5	1'5-1/2"	119.0	10.423	0.196	0.466	2.290	0.204 ✔
T10	20 - 0	0.625	1'5-11/32"	94.4	13.671	0.307	0.969	4.694	0.206 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	3/4	3'8-3/32"	3'6-23/32"	227.9	30.000	0.442	1.174	13.254	0.089 ✔
T2	132.917 - 130	3/4	4'7-13/16"	2'3-1/32"	144.2	30.000	0.442	1.310	13.254	0.099 ✔
T3	130 - 110	7/8	5'5/8"	2'5-3/8"	134.3	30.000	0.601	3.859	18.040	0.214 ✔
T4	110 - 95.2708	1	5'4-23/32"	2'7-5/16"	125.3	30.000	0.785	5.383	23.562	0.228

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 $\frac{P}{P_a}$
T5	95.2708 - 90	1	5'5-27/32"	2'7-27/32"	127.4	30.000	0.785	6.206	23.562	0.263 ✓
T6	90 - 80	L3x3x3/16	11'5"	4'11-25/32"	66.3	29.000	0.659	7.065	19.120	0.370 ✓
T7	80 - 60	L2 1/2x2 1/2x3/16	11'11-5/32"	5'4-19/32"	86.2	29.000	0.518	6.920	15.031	0.460 ✓
T8	60 - 40	L3x3x3/16	13'1-17/32"	6'3/16"	79.5	29.000	0.659	5.924	19.120	0.310 ✓
T9	40 - 20	L3x3x3/16	14'6-1/32"	6'8-23/32"	88.6	29.000	0.659	5.644	19.120	0.295 ✓
T10	20 - 0	L3x3x5/16	16'9-5/8"	7'10-3/32"	105.3	29.000	1.013	6.783	29.369	0.231 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T3	130 - 110	3/4	4'4-7/16"	4'2-7/16"	268.9	30.000	0.442	0.523	13.254	0.039 ✓
T4	110 - 95.2708	7/8	4'9-3/16"	4'6-15/16"	251.1	30.000	0.601	0.936	18.040	0.052 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	132.917 - 130	3/4	4'	3'10-1/2"	248.0	30.000	0.442	0.095	13.254	0.007 ✓
T5	95.2708 - 90	1 1/2	4'11-9/16"	4'9-5/16"	152.8	30.000	1.767	1.800	53.014	0.034 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	136 - 132.917	5x3/8	4'	3'10-1/2"	429.5	21.600	1.875	0.754	40.500	0.019 ✓
T2	132.917 - 130	7/8	4'	3'10-1/2"	212.6	30.000	0.601	0.332	18.040	0.018 ✓
T3	130 - 110	7/8	4'5/32"	3'10-5/32"	211.0	30.000	0.601	0.499	18.040	0.028

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T4	110 - 95.2708	1	4'6-7/32"	4'3-31/32"	207.8	30.000	0.785	1.406	23.562	0.060

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T2	132.917 - 130	7/8	4'	3'10-1/2"	212.6	30.000	0.601	0.616	18.040	0.034
T3	130 - 110	7/8	4'5-27/32"	4'3-27/32"	237.0	30.000	0.601	1.802	18.040	0.100
T5	95.2708 - 90	1	4'11-27/32"	4'9-19/32"	230.4	30.000	0.785	1.321	23.562	0.056

Section Capacity Table

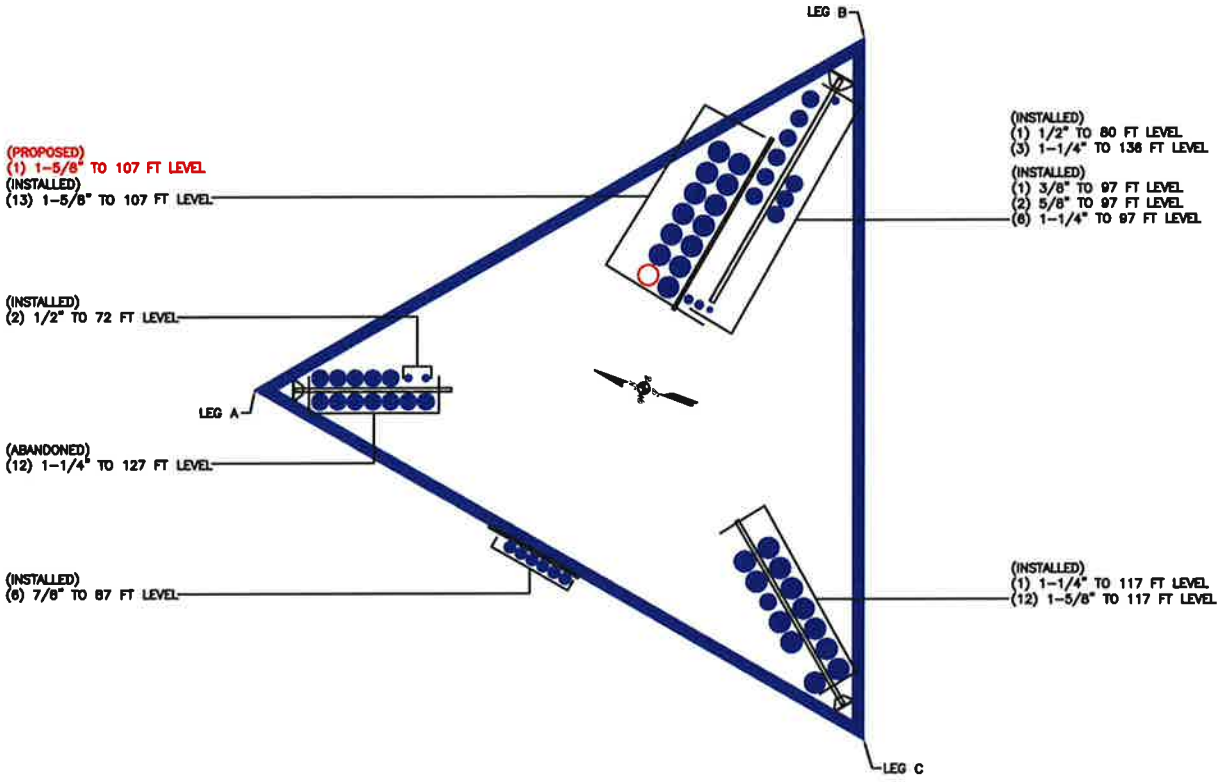
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	136 - 132.917	Leg	1 1/2	2	-1.565	26.530	5.9	Pass
T2	132.917 - 130	Leg	1 1/2	15	3.119	33.498	9.3	Pass
T3	130 - 110	Leg	2	31	34.935	67.690	51.6	Pass
T4	110 - 95.2708	Leg	2 1/4	97	-81.813	129.056	63.4	Pass
T5	95.2708 - 90	Leg	2 1/4	144	-103.914	146.995	70.7	Pass
T6	90 - 80	Leg	BT-99072-Pirod 105244 w/ (2) 1.25" Tie Rod	168	-110.568	187.197	59.1	Pass
T7	80 - 60	Leg	Pirod 105217	177	-152.639	184.672	82.7	Pass
T8	60 - 40	Leg	Pirod 105218	192	-184.894	258.238	71.6	Pass
T9	40 - 20	Leg	Pirod 105218	207	-212.208	258.238	82.2	Pass
T10	20 - 0	Leg	Pirod 105219	222	-236.886	343.622	68.9	Pass
T1	136 - 132.917	Diagonal	3/4	7	-1.227	3.457	35.5	Pass
T2	132.917 - 130	Diagonal	3/4	22	-1.403	5.221	26.9	Pass
T3	130 - 110	Diagonal	7/8	43	-3.900	8.195	47.6	Pass
T4	110 - 95.2708	Diagonal	1	106	-5.402	12.302	43.9	Pass
T5	95.2708 - 90	Diagonal	1	153	-6.313	11.891	53.1	Pass
T6	90 - 80	Diagonal	L3x3x3/16	173	-7.706	17.600	43.8 62.9 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	179	-6.233	9.648	64.6 67.0 (b)	Pass
T8	60 - 40	Diagonal	L3x3x3/16	193	-5.749	13.368	43.0 52.7 (b)	Pass
T9	40 - 20	Diagonal	L3x3x3/16	208	-5.694	10.672	53.4	Pass
T10	20 - 0	Diagonal	L3x3x5/16	223	-7.412	13.887	53.4	Pass
T3	130 - 110	Horizontal	3/4	53	-0.385	2.481	15.5	Pass
T4	110 - 95.2708	Horizontal	7/8	114	-0.738	3.875	19.0	Pass
T2	132.917 - 130	Secondary Horizontal	3/4	29	-0.095	2.918	3.2	Pass
T5	95.2708 - 90	Secondary Horizontal	1 1/2	155	-1.800	30.746	5.9	Pass
T1	136 - 132.917	Top Girt	5x3/8	4	-0.754	2.023	37.3	Pass
T2	132.917 - 130	Top Girt	7/8	18	-0.226	5.406	4.2	Pass
T3	130 - 110	Top Girt	7/8	36	-0.488	5.488	8.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T4	110 - 95.2708	Top Girt	1	100	-1.367	7.386	18.5	Pass
T2	132.917 - 130	Bottom Girt	7/8	21	-0.549	5.406	10.1	Pass
T3	130 - 110	Bottom Girt	7/8	38	-1.770	4.348	40.7	Pass
T5	95.2708 - 90	Bottom Girt	1	145	-1.213	6.010	20.2	Pass
							Summary	
						Leg (T7)	82.7	Pass
						Diagonal (T7)	67.0	Pass
						Horizontal (T4)	19.0	Pass
						Secondary Horizontal (T5)	5.9	Pass
						Top Girt (T1)	37.3	Pass
						Bottom Girt (T3)	40.7	Pass
						Bolt Checks	68.9	Pass
						RATING =	**82.7**	**Pass**

Program Version 6.1.4.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876338

APPENDIX C

ADDITIONAL CALCULATIONS

PROJECT	**99072.001.01 - WATERFORD, CT**				**SS**
SUBJECT	**Pad Footing Analysis**				
DATE	**06/24/15**	PAGE	**1**	OF	**9**

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

99072_001_01_SS Unit Base Unified (1 5)_Square_Rev F-G.xls

B&T Proj. No.: 0

Combined Footing Foundation Analysis

Design Loads:

Input unfactored loads

Compression per leg (P_C)	=	245.0	(k)
Tension per leg (P_T)	=	218.0	(k)
Overturning Moment (M_O)	=	2,822.0	(k)
Total Tower Horizontal Load	=	34.0	(k-ft)
Tower + Appurtenances	=	37.0	(k)

Saftey Factors

Rev. Type: F

Uplift S.F. (Conc. Wt.)	=	1.25
Uplift S.F. (Soil Wt.)	=	2.00
Overturning S.F.	=	1.50
Bearinging S.F.	=	2.00

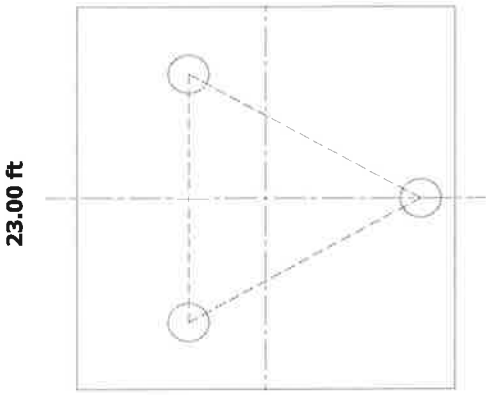
Tower Information

Tower base width = 14.00 ft

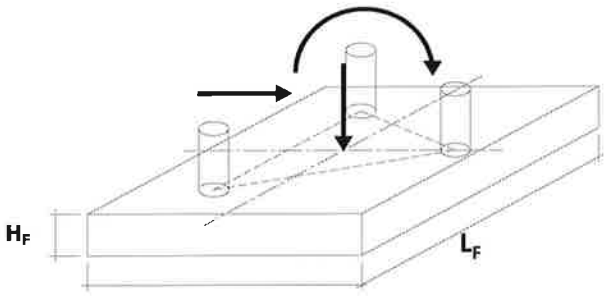
Pad & Pier Dimensions / Properties:

Tower Shape (triangle or square)	=	T	
Pier Shape (round or square)	=	R	
Pier Diameter (H_P)	=	3.00	(ft)
Pier height above grade (D_A)	=	0.50	(ft)
Footing Width (W_F)	=	23.00	(ft)
Footing Thickness (H_F)	=	3.25	(ft)
Depth to BOC (D)	=	6.00	(ft)
Concrete Strength (F'c)	=	3.00	(ksi)
Rebar Strength (Fy)	=	60.00	(ksi)
Ultimate Load Factor	=	1.30	
Min. Cover over Rebar	=	3.00	(in)
Qty of footing Rebar (1 layer)	=	46	
Size of footing Rebar	=	# 9	(bar)
Qty of Vertical Rebar per Pier	=	15	
Size of Pier Vertical Rebar	=	# 8	(bar)
Qty of Rebar Ties per Pier	=	7	
Size of Pier Rebar Ties	=	# 4	(bar)

Plan View for Triangle or Square Tower



Total Overview



Soil Data:

Allowable Values

Soil bearing	=	4000	(psf)
Soil bearing (ultimate)	=	8000	(psf)
Soil Cone for Uplift (θ)	=	36	(degrees)
Cohesion (C)	=	0.00	(ft)
Top Soil to Neglect (N)	=	2.00	(ft)
Base Sliding (μ)	=	0.30	(ksf)
Dry Soil Density (γ_{DRY})	=	120	(pcf)

Summary of Results

Overturing	89.06%
Soil Bearing	56.61%
Base Sliding	25.21%
One way Shear	1.92%
Punching Shear	25.58%
Pad Moment Capacity	10.30%
Pier Moment Capacity	16.93%

B+T GRP

PROJECT :	99072.001.01	ELEVATION :	80-90
CLIENT :	CCI	DESIGN BY :	SSH/AA
BU NO. :	876338	DATE : 6/24/2015	REVIEW BY : AA

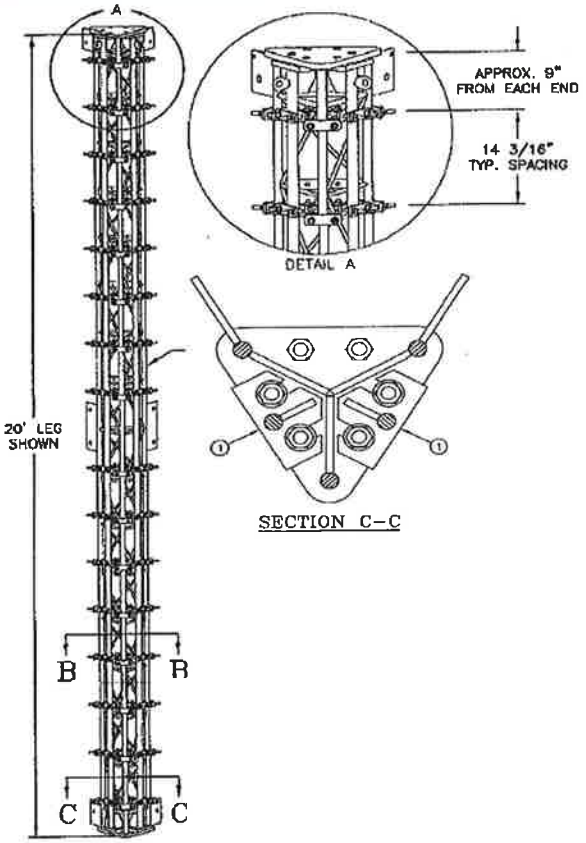
Flexural Buckling of Truss Leg, AISC Manual 14th Edition (AISC 360-10 E3)

Design Criteria

TIA Revision:	F		
Youngs Modulus,	E:	29000	ksi
Existing Rods:	Grade (Fy) :	50	ksi
	Load:	108.663	kips
Existing PiRod Leg Part Number:		105244	
Existing Tie Rod Diameter:		1.25	in
Diagonal Spacing:		10	ft

Existing Rods		
Qty:	3	
Diameter:	1.25	in
K:	1	ksi
Lu:	14.1875	in
Truss Leg Width:	12	in

New Rods		
Qty:	2	
Diameter:	1.25	in
K:	1	ksi
Lu:	24	in



Capacity:	**140**	kips
% Capacity:	**77.4%**	Pass
Equivalent Diameter:	**1.5093**	in