Robinson+Cole

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October 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**
48 Cow Hill Road, Clinton, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 209-foot level of the existing 212-foot tower at 48 Cow Hill Road in Clinton, Connecticut (the "Property"). The tower and underlying property are owned by Crown Castle. The Council approved Cellco's use of this tower in 1992 (Docket No. 148). Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same 209-foot level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs") with three (3) newer model RRHs and install six (6) new RRHs behind its 700 MHz, 1900 MHz and 2100 MHz antennas and two (2) HYBRIFLEX™ 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 William W. Fritz, Clinton's First Selectman. A copy of this letter is also being sent to Crown, the owner of the Property and the tower.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. The replacement antennas and RRHs will be located at the 209-foot level on the 212-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 modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative 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:
William W. Fritz, Clinton First Selectman
Holly Haas, Crown Castle
Tim Parks

ATTACHMENT 1

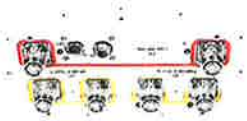
Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.



- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

* 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® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Product Specifications

SBNHH-1D65B

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
RET System	Teletilt®

Packed Dimensions

Depth	299.0 mm | 11.8 in
Length	1970.0 mm | 77.6 in
Width	409.0 mm | 16.1 in
Shipping Weight	31.0 kg | 68.3 lb

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

Product Specifications

SBNHH-1D65B

BSAMNT-1 — Wide Profile Antenna 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

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.

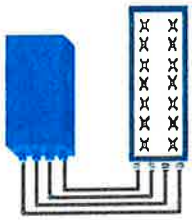
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

TECHNICAL SPECIFICATIONS

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

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

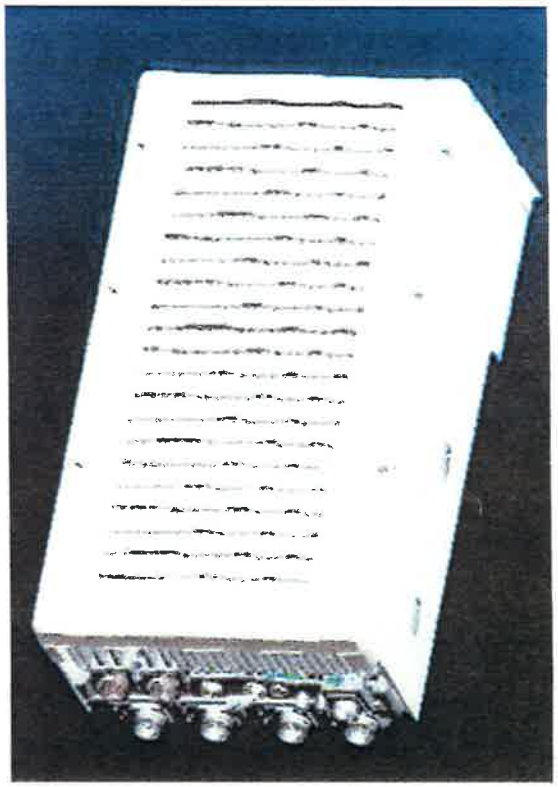
	RRH2x60
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver 1900 HW version	2 Branch RX – LA6.0.1
Receiver 1900A HW version	4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA
	Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms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

** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

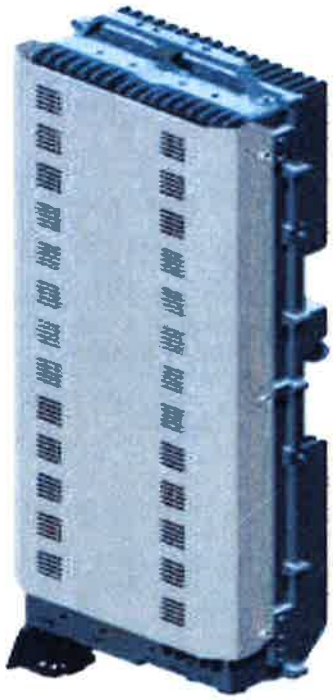
	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	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.)

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



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

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

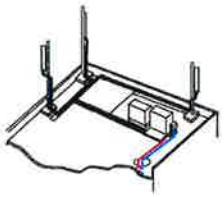
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

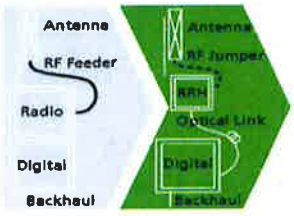
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

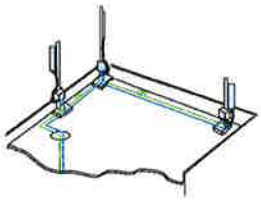
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm²(8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL 94-V0, UL 1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-93-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

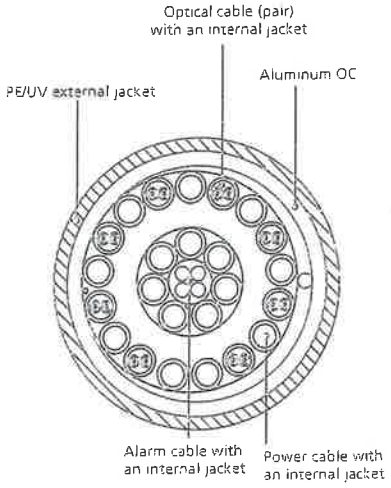


Figure 2: Construction Detail

- This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Clinton								
Tower Height: 212ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	1	500	190	0.0053	880	0.5867	0.09%	
*AT&T GSM	6	296	190	0.0189	880	0.5867	0.32%	
*AT&T GSM	3	427	190	0.0136	1900	1.0000	0.14%	
*AT&T LTE	1	500	190	0.0053	740	0.4933	0.11%	
*T-Mobile GSM/UMTS	2	12	140	0.0005	1950	1.0000	0.00%	
*T-Mobile UMTS	2	12	140	0.0005	2100	1.0000	0.00%	
*T-Mobile LTE	2	24	140	0.0010	2100	1.0000	0.01%	
*Pocket (now MetroPCS)	3	631	182	0.0220	2130	1.0000	0.22%	
*Sprint CDMA/LTE	3	693	198	0.0203	1900	1.0000	0.20%	
*Sprint CDMA/LTE	1	390	198	0.0038	850	0.5667	0.07%	
*Sprint CDMA/LTE	2	693	198	0.0135	2500	1.0000	0.14%	
*Nextel	9	100	175	0.0113	851	0.5673	0.20%	
*Town	6	100	125	0.0152	46	0.2000	0.76%	
*MediaFLO			228				6.63%	
Verizon	**1**	**2244**	**209**	**0.0185**	**1970**	**1.0000**	**1.85%**	
Verizon	**9**	**315**	**209**	**0.0233**	**869**	**0.5793**	**4.03%**	
Verizon	**1**	**2306**	**209**	**0.0190**	**2145**	**1.0000**	**1.90%**	
Verizon	**1**	**1050**	**209**	**0.0086**	**698**	**0.4973**	**1.74%**	
								18.40%
* Source: Siting Council								

ATTACHMENT 3

August 05, 2015

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

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:	119685
	Carrier Site Name:	Clinton CT
Crown Castle Designation:	**Crown Castle BU Number:**	806363
	Crown Castle Site Name:	HRT 105 943201
	Crown Castle JDE Job Number:	342340
	Crown Castle Work Order Number:	1099913
	Crown Castle Application Number:	305715 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	100083.001.01
Site Data:	**48 Cow Hill Road, Clinton, Middlesex County, CT** **Latitude *41° 17' 20.2"*, Longitude *-72° 32' 18.5"*** **212 Foot - Self Support Tower**	

Dear Holly Haas,

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 812337, in accordance with application 305715, revision 0.

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

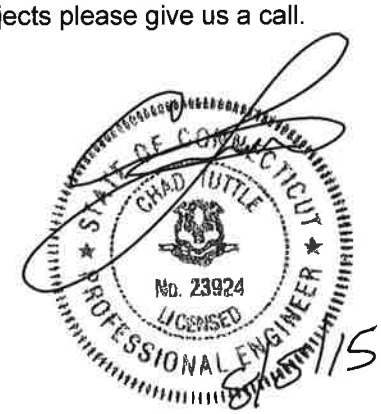
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code 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.



Jyoti Ojha
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2016

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 212.625 ft Self Support tower designed by ROHN in June of 1992. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E. The tower has been modified by VSI in June of 2007 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 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
208.0	209.0	3	Alcatel Lucent	RRH2X60-AWS	2	1-5/8	--
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		9	Andrew	SBNHH-1D65B			
		1	RFS Celwave	DB-B1-6C-12AB-0Z			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
208.0	209.0	**3**	**Alcatel Lucent**	**RRH2X40-AWS**	--	--	**4**
		3	**Antel**	**BXA-171063-8CF-EDIN-X**			
		3	**Antel**	**BXA-171085-8BF-EDIN-2**			
		3	**Antel**	**BXA-70063/6CF-EDIN**			
		6	Antel	LPA-80080/6CF	18	1-5/8	1
		1	RFS Celwave	DB-T1-6Z-8AB-0Z	1	1-1/4	
	208.0	1	--	Sector Mount [SM 510-3]			
199.0	199.0	1	--	Sector Mount [SM 505-3]	4	1-1/4	1
	198.0	3	Alcatel Lucent	1900MHz RRH (65MHz)			
		3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		3	Alcatel Lucent	TD-RRH8x20-25			
		3	RFS Celwave	APXVSPP18-C-A20			
		3	RFS Celwave	APXVTM14-C-120			
189.0	190.0	3	Ericsson	RRUS 11	--	--	2
		6	ADC	DUAL BAND 800/1900 FULL BAND MASTHEAD	12	1-5/8	1
		3	Ericsson	RRUS 11	2	7/8	
		3	KMW Communications	AM-X-CD-14-65-00T-RET	1	17/64	
		6	Powerwave Tech.	7020.00			
		6	Powerwave Tech.	7770.00			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	Powerwave Tech.	LGP13519			
		1	Raycap	DC6-48-60-18-8F			
	189.0	1	--	Sector Mount [SM 602-3]			
183.0	183.0	3	RFS Celwave	APXV18-206517LS	6	1-5/8	1
175.0	179.0	2	Radio waves	HPD2-23	4	1/4	1
	176.0	12	Decibel	DB844H90E-XY	12	1-1/4	3
	175.0	1	--	Sector Mount [SM 510-3]			
167.0	173.0	1	RFS Celwave	1151-3	1	7/8	1
	167.0	1	--	Side Arm Mount [SO 308-1]			
164.0	173.0	1	RFS Celwave	1151-3	1	7/8	1
	164.0	1	--	Side Arm Mount [SO 308-1]			
162.0	162.0	1	--	Side Arm Mount [SO 308-1]	1	3/8	1
	160.0	1	Sinclair	SD310-HL			
147.0	153.0	1	RFS Celwave	1151-3	1	7/8	1
	147.0	1	--	Side Arm Mount [SO 308-1]			
145.0	148.0	1	Sinclair	SD310-HL	1	7/8	1
	145.0	1	--	Side Arm Mount [SO 308-1]			
139.0	140.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	7	1-5/8	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P	5	1-1/4	
		3	Ericsson	KRY 112 144/1	3	7/8	
	139.0	1	--	Side Arm Mount [SO 104-3]			
128.0	132.0	1	RFS Celwave	1142-2C	1	7/8	1
	128.0	1	--	Side Arm Mount [SO 308-1]			
51.0	51.0	1	GPS	GPS_A	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Abandoned Equipment; Considered in This Analysis
4) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
212	212	12	Sinclair	SRL410C4 w/ 6' Side Arms	--	--
200	200	2	Generic	6' Grid Dish	--	--
190	190	9	Swedcom	ALP9212N w/ Mounting Frame	--	--
100	100	1	Decibel	DB222 w/ Mount	--	--
90	90	1	Decibel	DB225 w/ Mount	--	--
80	80	2	Decibel	DB225-2 w/ Mounts	--	--
60	60	1	Decibel	DB212-2 w/ Mount	--	--
		1	Decibel	DB225 w/ Mount		
		1	Decibel	DB225-2 w/ Mount		
50	50	1	Decibel	DB212-2 w/ Mount	--	--
40	40	1	Decibel	DB212 w/ Mount	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Revision# 0	305715	CCI Sites
Tower Manufacturer Drawing	ROHN, Eng. File No: 28529JC	262274	CCI Sites
Previous Structural Analysis	CCI Project No. 757833	4922028	CCI Sites
Tower Modification Drawing	VSI, Date: 06/29/2007	2169576	CCI Sites
Post Modification Inspection	VSI, Date: 10/30/2007	2146143	CCI Sites
Foundation Drawing	ROHN, Eng. File No: 28529JC	262273	CCI Sites
Geotech Report	Clarence Welti Assoc., Inc., Date: 07/06/1992	262276	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 08/03/2015	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.
6) Tower Geometry information not provided in manufactures drawing was taken from previous SA by CCI dated May 10, 2014, document No 4922028.

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	212.625 - 202.458	Leg	ROHN 2.5 STD	1	-2.853	37.412	12.5	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-31.589	83.436	37.9	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	67	-77.276	138.584	55.8	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	108	-127.355	202.611	62.9	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-158.247	211.352	74.9	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-192.286	263.177	73.1	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-222.678	263.177	84.6	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-251.140	331.422	75.8	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-278.843	331.206	84.2	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-290.925	433.397	67.1	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-347.984	433.915	80.2	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	14	-3.994	21.598	18.5	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	39	-11.098	15.455	71.8	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	72	-10.876	13.357	81.4	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-10.494	11.468	91.5	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-13.556	14.351	94.5	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	176	-12.145	12.581	96.5	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	203	-12.160	21.764	55.9	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	230	-11.941	19.220	62.1	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	257	-12.958	16.870	76.8	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	284	-18.281	27.453	66.6	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	317	-21.301	26.233	81.2	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	13	-2.885	20.302	14.2 16.8 (b)	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-6.041	20.252	29.8 35.2 (b)	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	70	-6.833	17.381	39.3 39.8 (b)	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-7.374	24.654	29.9 43.0 (b)	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	148	-8.147	20.439	39.9 47.5 (b)	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	175	-8.027	14.859	54.0	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	202	-8.625	25.422	33.9 50.2 (b)	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	229	-8.973	19.852	45.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
							52.3 (b)	
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	256	-10.180	15.702	64.8	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	283	-10.022	27.888	35.9 40.5 (b)	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	316	-12.387	22.692	54.6	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	5	-0.263	20.345	1.3	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	288	-5.053	11.800	42.8	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-6.036	9.837	61.4	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	293	-4.667	7.764	60.1	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	326	-5.199	7.188	72.3	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	308	-0.026	10.756	0.2	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	341	-0.024	8.848	0.3	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal Bracing	ROHN 2.5 STD	309	-0.052	6.862	0.8	Pass
T11	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	340	-0.051	6.200	0.8	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	16	-0.004	5.830	0.3	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	42	-0.007	5.727	0.3	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	79	-0.006	4.221	0.3	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	118	-0.007	2.892	0.4	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	157	-0.007	2.186	0.4	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	184	-0.006	3.454	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	211	-0.008	4.548	0.5	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.010	7.401	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	265	-0.010	5.898	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.012	19.744	0.4	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.010	16.155	0.4	Pass
							Summary	
						Leg (T7)	84.6	Pass
						Diagonal (T6)	96.5	Pass
						Horizontal (T9)	64.8	Pass
						Top Girt (T1)	1.3	Pass
						Redund Horz 1 Bracing (T11)	61.4	Pass
						Redund Diag 1 Bracing	72.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						(T11)		
						Redund Hip 1 Bracing (T11)	0.3	Pass
						Redund Hip Diagonal Bracing (T11)	0.8	Pass
						Inner Bracing (T7)	0.5	Pass
						Bolt Checks	66.9	Pass
						RATING =	**96.5**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	67.0	Pass
1	Base Foundation (Steel)	Base	33.6	Pass
1	Base Foundation (Soil Interaction)	Base	68.6	Pass

Structure Rating (max from all components) =	96.5%

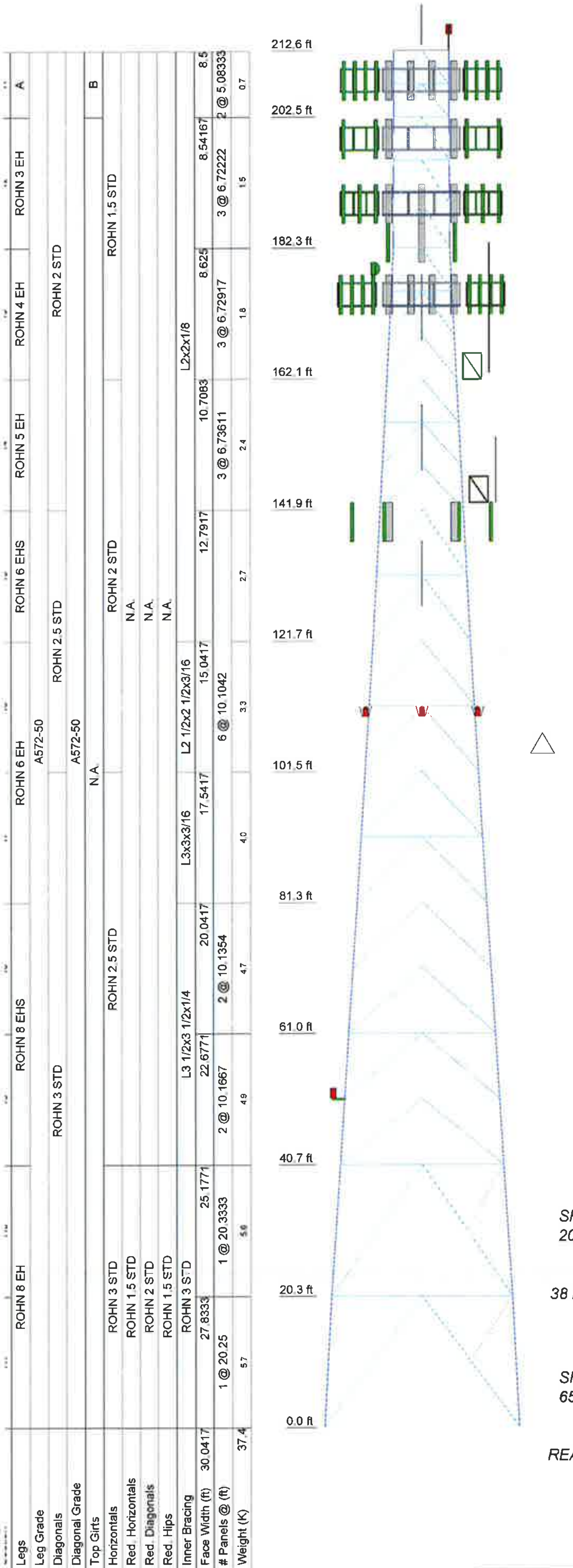
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 6' (E)	213.625	(2) 7020.00 (E)	189
Climb Leg Extension (E)	212.625	(2) 7020.00 (E)	189
Flash Beacon Lighting (E)	212.625	(2) 7020.00 (E)	189
4' x 2" Pipe Mount (E-For Beacon)	212.625	(2) LGP13519 (E)	189
(2) LPA-80080/6CF w/ Mount Pipe (E)	208	(2) LGP13519 (E)	189
(2) LPA-80080/6CF w/ Mount Pipe (E)	208	(2) LGP13519 (E)	189
(2) LPA-80080/6CF w/ Mount Pipe (E)	208	DC6-48-60-18-8F (E)	189
DB-T1-6Z-8AB-0Z (E)	208	RRUS 11 (R)	189
(3) SBNHH-1D65B w/ Mount Pipe (P)	208	RRUS 11 (R)	189
(3) SBNHH-1D65B w/ Mount Pipe (P)	208	RRUS 11 (R)	189
(3) SBNHH-1D65B w/ Mount Pipe (P)	208	Sector Mount [SM 602-3] (E)	189
DB-B1-6C-12AB-0Z (P)	208	APXV18-206517LS w/ Mount Pipe (E)	183
RRH2X60-PCS (P)	208	APXV18-206517LS w/ Mount Pipe (E)	183
RRH2X60-PCS (P)	208	APXV18-206517LS w/ Mount Pipe (E)	183
RRH2X60-PCS (P)	208	(4) DB844H90E-XY w/ Mount Pipe (AB)	175
RRH2x60-700 (P)	208	(4) DB844H90E-XY w/ Mount Pipe (AB)	175
RRH2x60-700 (P)	208	(4) DB844H90E-XY w/ Mount Pipe (AB)	175
RRH2x60-700 (P)	208	6' x 2" Mount Pipe (E-Dish Mount)	175
RRH2X60-AWS (P)	208	6' x 2" Mount Pipe (E-Dish Mount)	175
RRH2X60-AWS (P)	208	Sector Mount [SM 510-3] (E)	175
RRH2X60-AWS (P)	208	HPD2-23 (E)	175
Sector Mount [SM 510-3] (E)	208	HPD2-23 (E)	175
APXVSPP18-C-A20 w/ Mount Pipe (E)	199	1151-3 (E)	167
APXVSPP18-C-A20 w/ Mount Pipe (E)	199	Side Arm Mount [SO 308-1] (E)	167
APXVSPP18-C-A20 w/ Mount Pipe (E)	199	1151-3 (E)	164
APXVTM14-C-120 w/ Mount Pipe (E)	199	Side Arm Mount [SO 308-1] (E)	164
APXVTM14-C-120 w/ Mount Pipe (E)	199	SD310-HL (E)	162
APXVTM14-C-120 w/ Mount Pipe (E)	199	Side Arm Mount [SO 308-1] (E)	162
1900MHz RRH (65MHz) (E)	199	1151-3 (E)	147
1900MHz RRH (65MHz) (E)	199	Side Arm Mount [SO 308-1] (E)	147
1900MHz RRH (65MHz) (E)	199	SD310-HL (E)	145
800MHz 2X50W RRH W/FILTER (E)	199	Side Arm Mount [SO 308-1] (E)	145
800MHz 2X50W RRH W/FILTER (E)	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	139
800MHz 2X50W RRH W/FILTER (E)	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	139
TD-RRH8x20-25 (E)	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	139
TD-RRH8x20-25 (E)	199	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	139
TD-RRH8x20-25 (E)	199	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	139
(3) 4' x 2" Pipe Mount (E)	199	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	139
(3) 4' x 2" Pipe Mount (E)	199	KRY 112 144/1 (E)	139
(3) 4' x 2" Pipe Mount (E)	199	KRY 112 144/1 (E)	139
Sector Mount [SM 505-3] (E)	199	KRY 112 144/1 (E)	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	189	Side Arm Mount [SO 104-3] (E)	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	189	1142-2C (E)	128
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	189	Side Arm Mount [SO 308-1] (E)	128
(2) 7770.00 w/ Mount Pipe (E)	189	Side Lighting (E)	110
(2) 7770.00 w/ Mount Pipe (E)	189	Side Lighting (E)	110
(2) 7770.00 w/ Mount Pipe (E)	189	Side Lighting (E)	110
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	189	GPS_A (E)	51
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	189	Side Arm Mount [SO 701-1] (E)	51
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	189		
RRUS 11 (E)	189		
RRUS 11 (E)	189		
RRUS 11 (E)	189		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	B	ROHN 1.5 STD

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.5%

B+T Group
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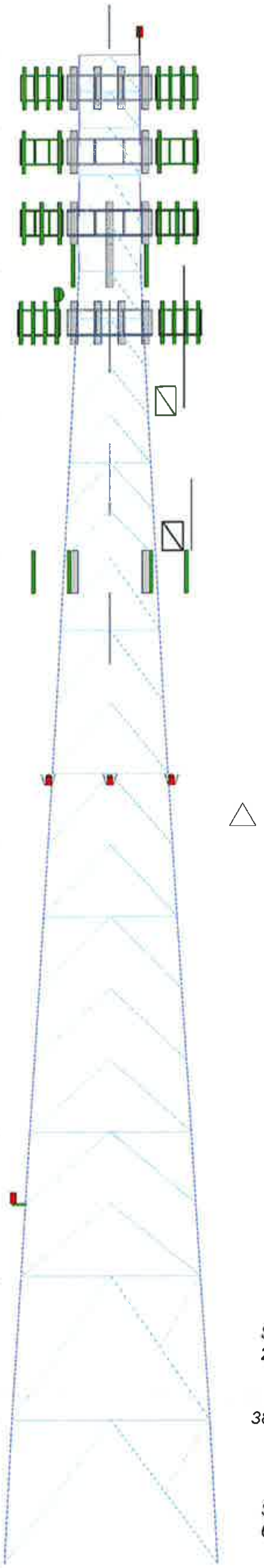
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 100083.001.01 - HRT 105 943201, CT (BU# 806		
Project:		
Client: Crown Castle	Drawn by: jojha	App'd:
Code: TIA/EIA-222-F	Date: 08/05/15	Scale: NTS
Path: C:\Users\jojha\Desktop\100083.001\Tnx\100083_001_01_HRT 105 943201_CT.eri		Dwg No. E-1

Section (ft)	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Red. Horizontals	Red. Diagonals	Red. Hips	Inner Bracing	Face Width (ft)	# Panels @ (ft)	Weight (K)
212.6 – 202.5	A	A572-50	ROHN 2 STD	A572-50	B						8.5	2 @ 5.08333	0.7
202.5 – 182.3	ROHN 3 EH				N.A.	ROHN 1.5 STD					8.54167	3 @ 6.72222	1.5
182.3 – 162.1	ROHN 4 EH									L2x2x1/8	8.625	3 @ 6.72917	1.8
162.1 – 141.9	ROHN 5 EH		ROHN 2.5 STD			ROHN 2 STD					10.7083	3 @ 6.73611	2.4
141.9 – 121.7	ROHN 6 EHS						N.A.	N.A.	N.A.	L2 1/2x2 1/2x3/16	12.7917		2.7
121.7 – 101.5	ROHN 6 EH					ROHN 2.5 STD					15.0417	6 @ 10.1042	3.3
101.5 – 81.3										L3x3x3/16	17.5417		4.0
81.3 – 61.0	ROHN 8 EHS		ROHN 3 STD							L3 1/2x3 1/2x1/4	20.0417	2 @ 10.1354	4.7
61.0 – 40.7											22.6771	2 @ 10.1667	4.9
40.7 – 20.3	ROHN 8 EH					ROHN 3 STD	ROHN 1.5 STD	ROHN 2 STD	ROHN 1.5 STD	ROHN 3 STD	25.1771	1 @ 20.3333	5.8
20.3 – 0.0											27.8333	1 @ 20.25	5.7
Base											30.0417		37.4



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	B	ROHN 1.5 STD

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

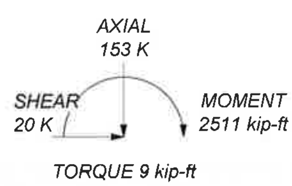
TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.5%

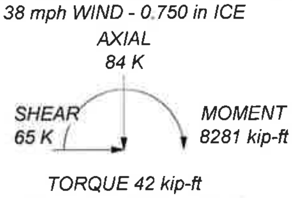
MAX. CORNER REACTIONS AT BASE:

DOWN: 346 K
SHEAR: 39 K

UPLIFT: -287 K
SHEAR: 35 K



38 mph WIND - 0.750 in ICE



REACTIONS - 85 mph WIND

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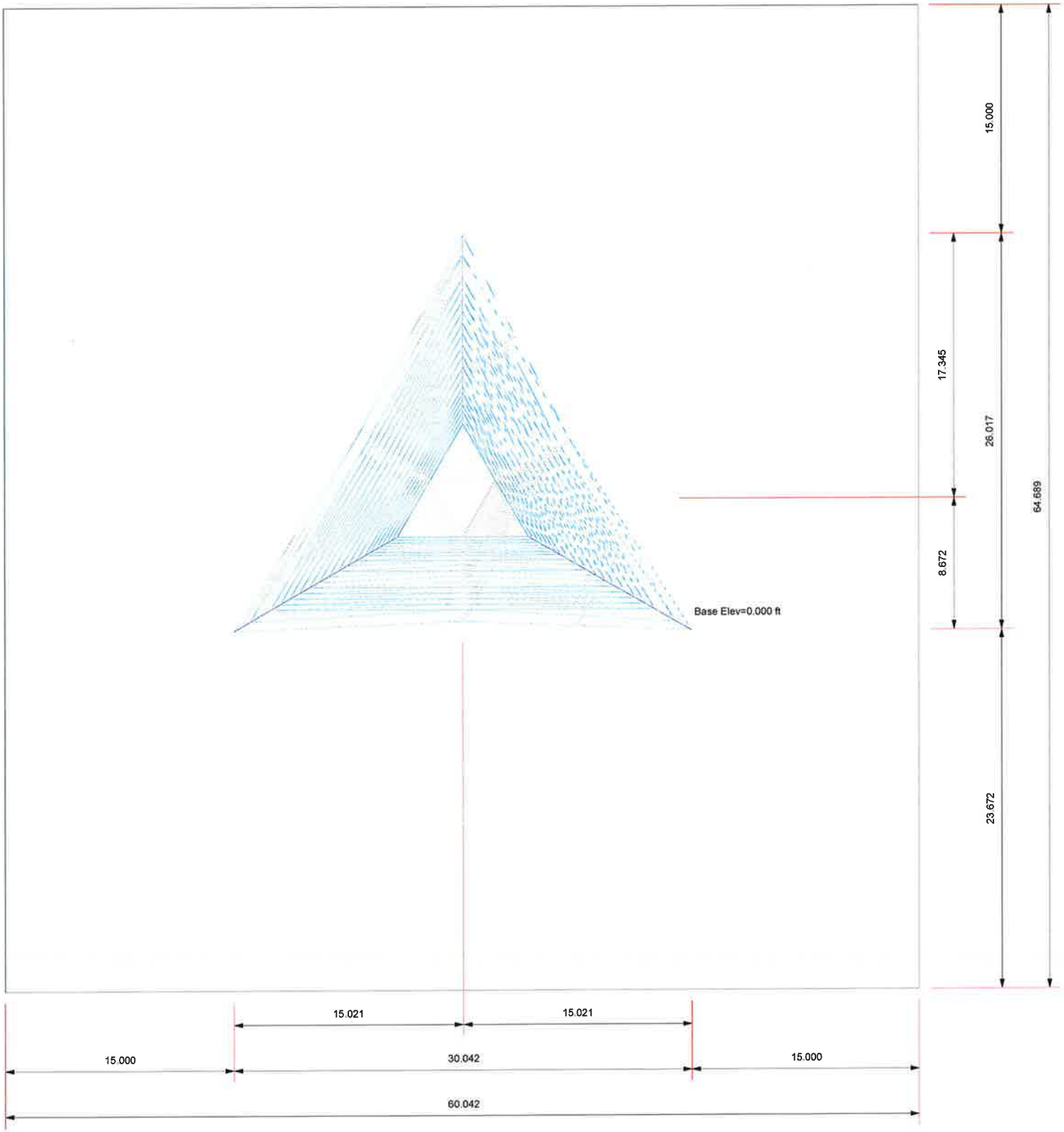
Project:		
Client: Crown Castle	Drawn by: jojha	App'd:
Code: TIA/EIA-222-F	Date: 08/05/15	Scale: NTS
Path: C:\Users\jojha\Desktop\100083.001\Tnx\100083_001_01_HRT 105 943201_CT.eri		Dwg No. E-1

Plot Plan

Total Area - 0.09 Acres



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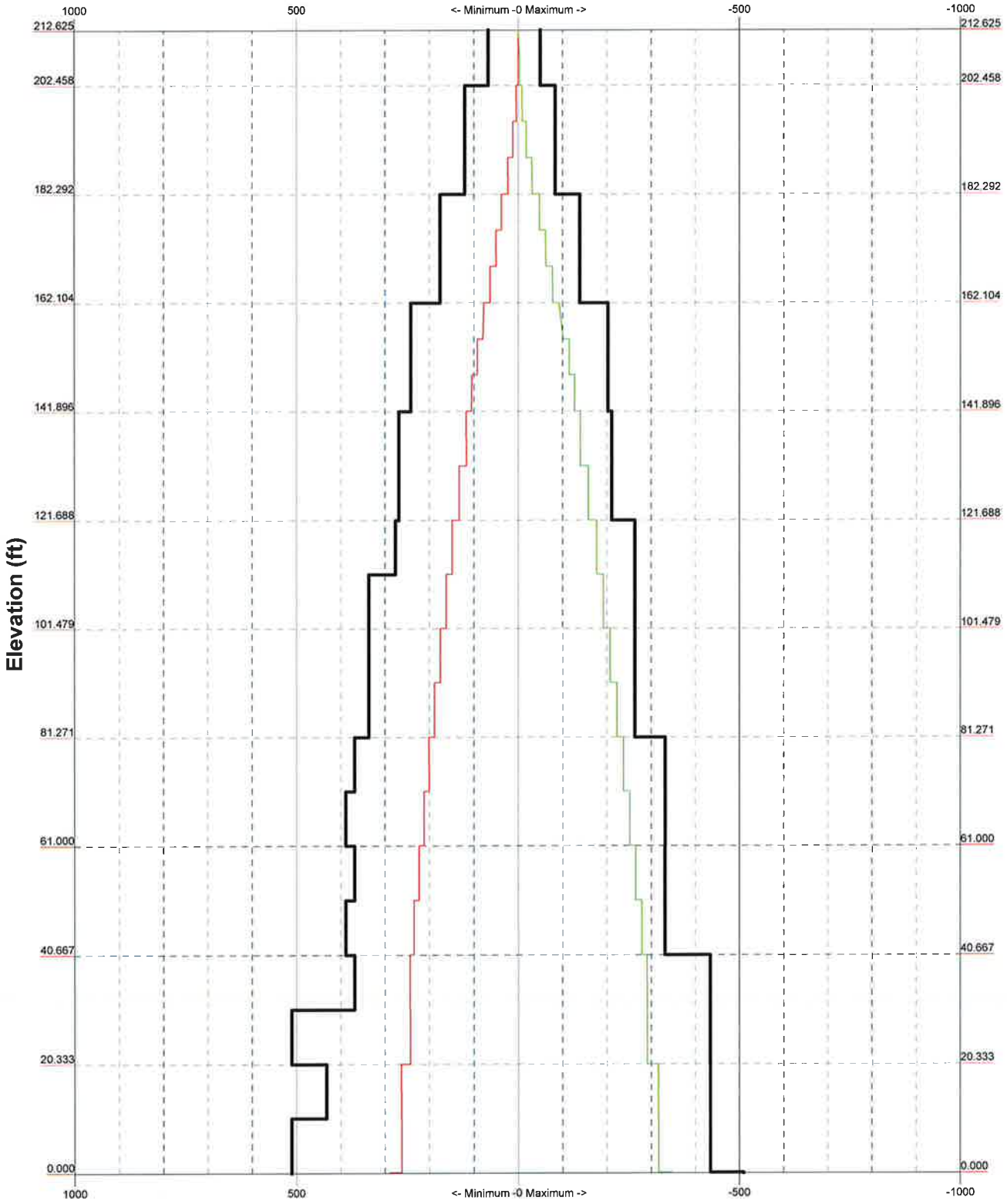
TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

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



B+T GRP

B+T Group
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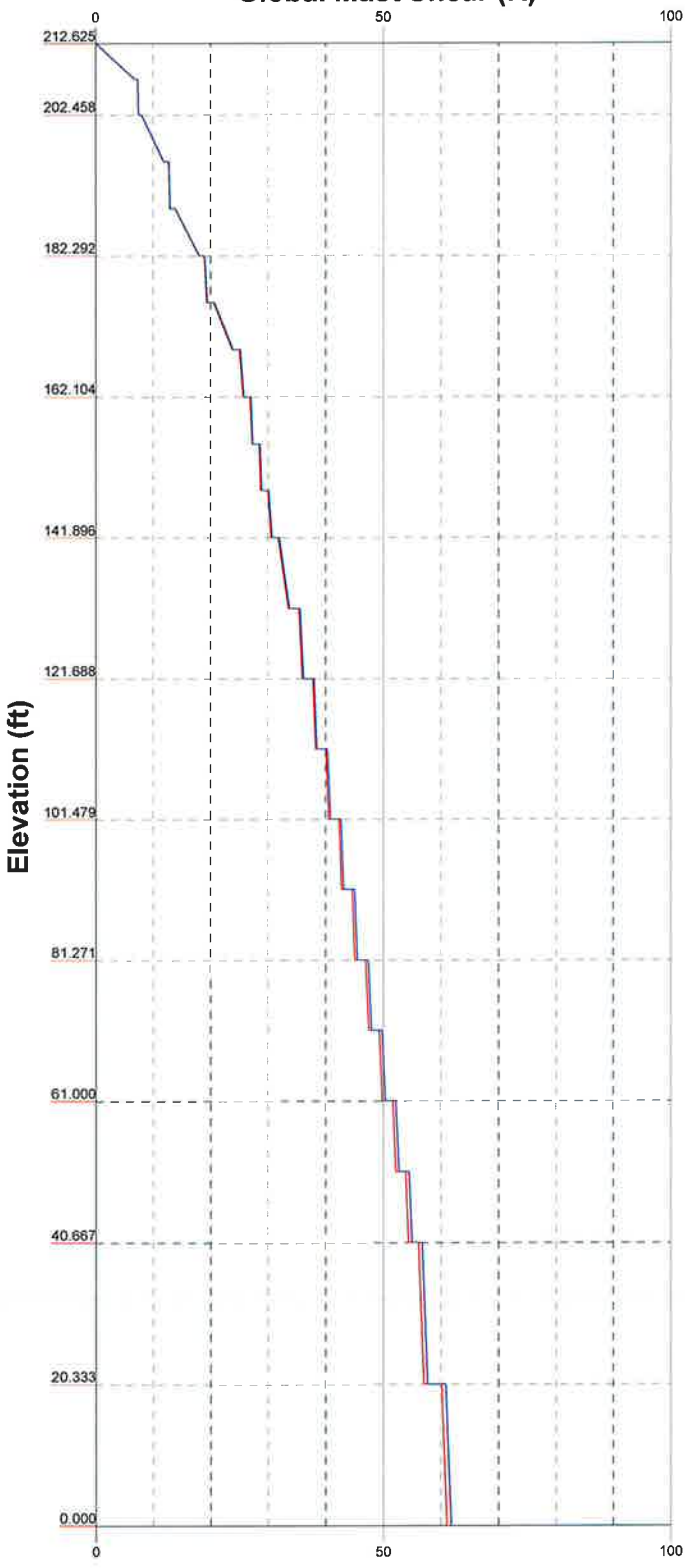
Job: *100083.001.01 - HRT 105 943201, CT (BU# 806*			
Project:			
Client: Crown Castle	Drawn by: jojha		App'd:
Code: TIA/EIA-222-F	Date: 08/05/15		Scale: NTS
Path: C:\Users\jojha\Desktop\100083.001\Trx\100083_001_01_HRT 105 943201_CT.eri			Dwg No. E-3

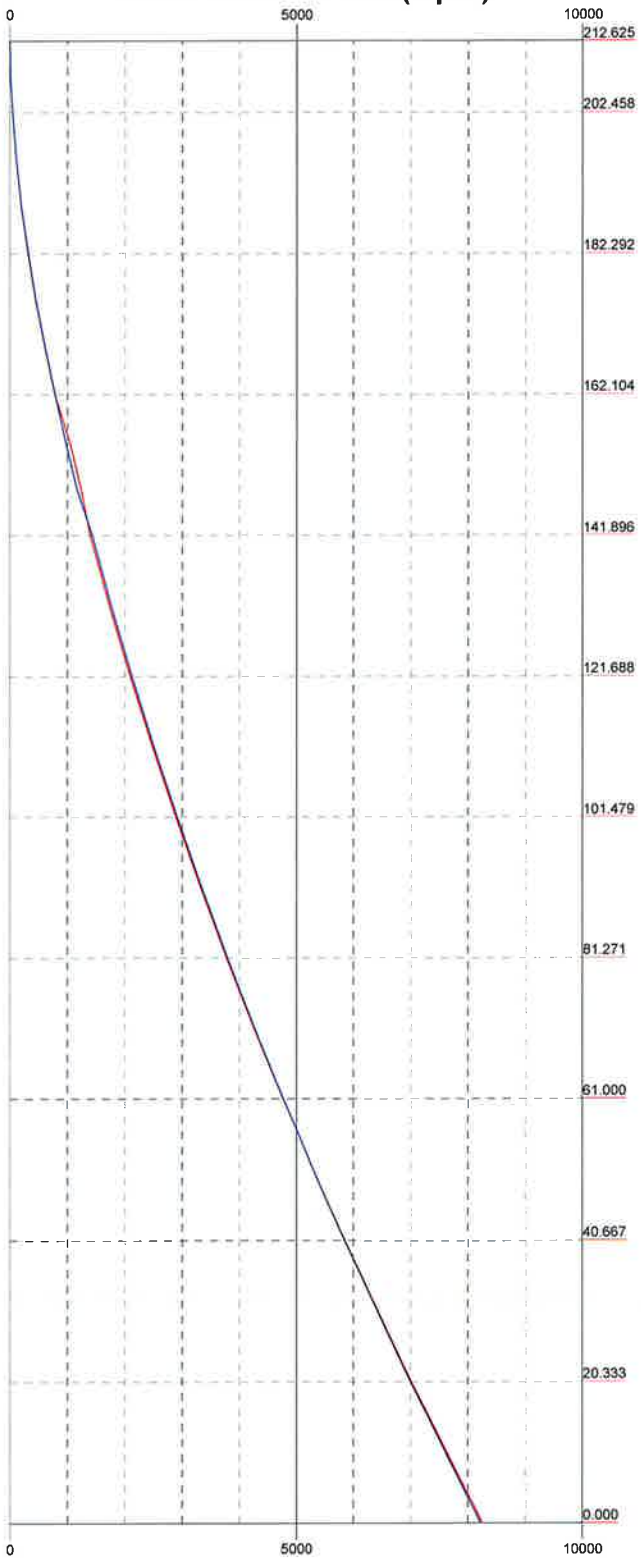
Vx Vz

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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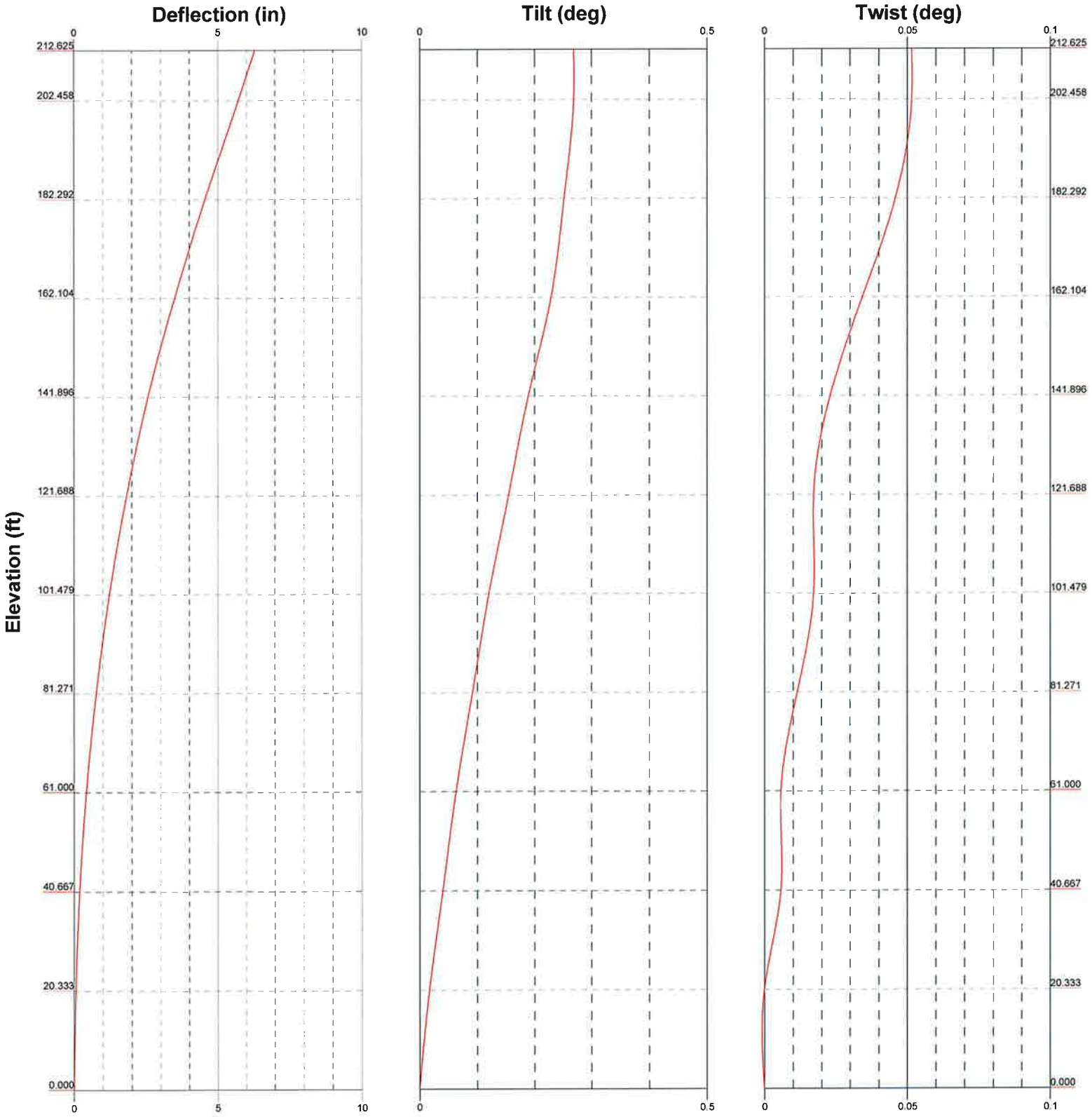
TIA/EIA-222-F - Service - 50 mph

Maximum Values



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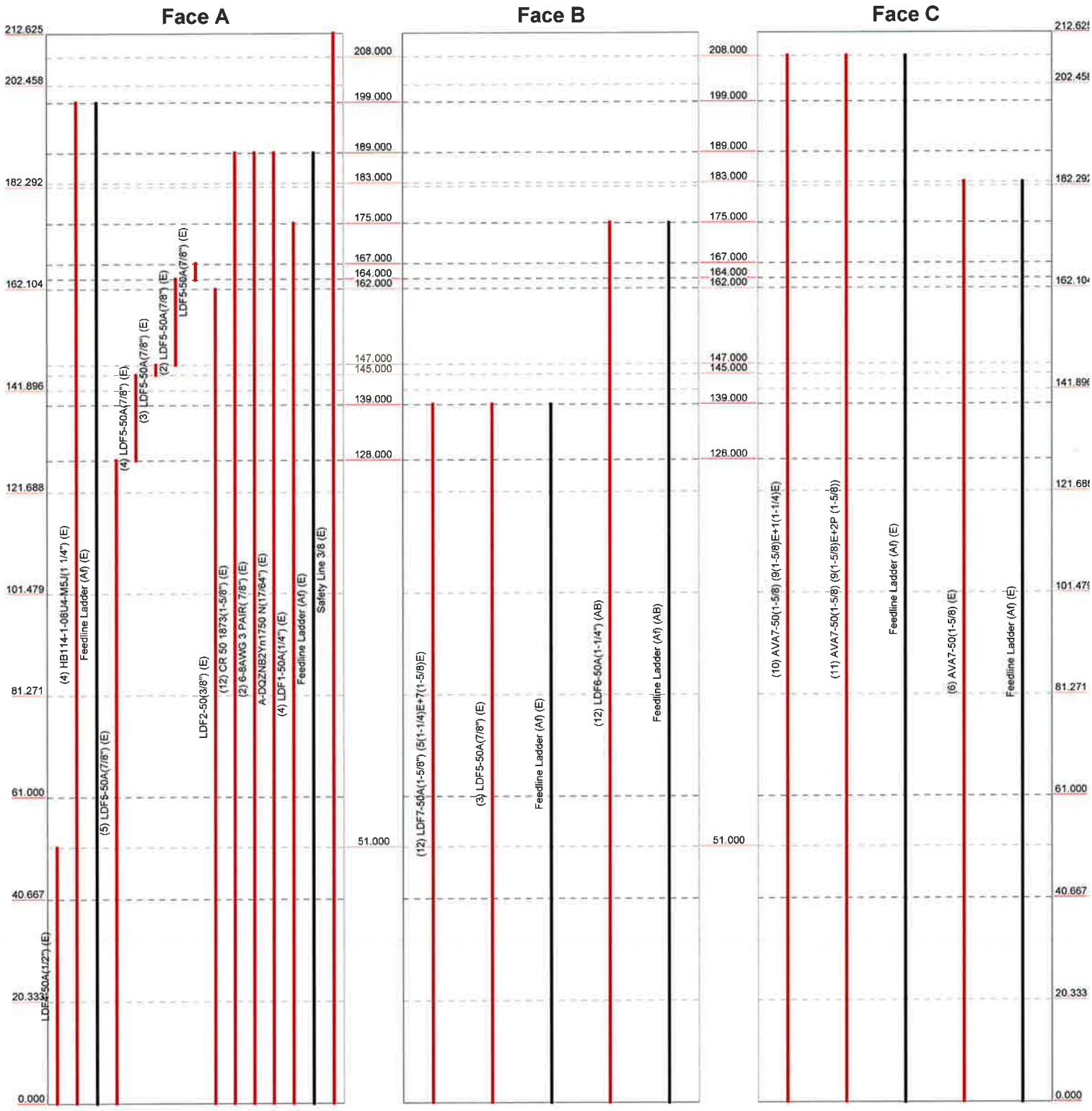
Path: C:\Users\jojha\Desktop\100083.001\Tnx\100083_001_01_HRT 105 943201_CT.eri		Dwg No. E-5	

0' - 212'7-1/2"

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



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Path: C:\Users\jojha\Desktop\100083.001\Twr\100083_001_01_HRT 105 943201_CT.eli		Dwg No. E-7	

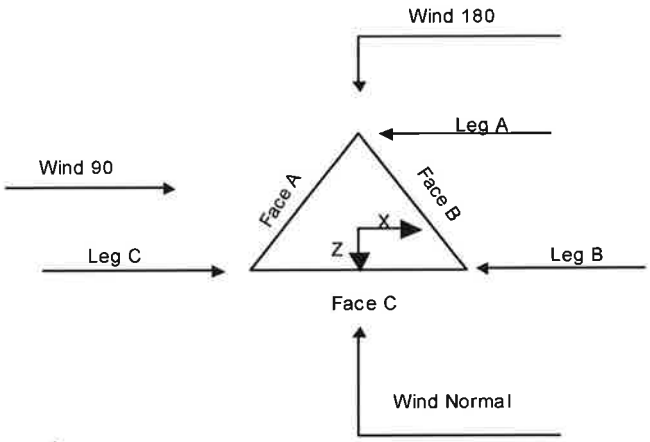
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 212.625 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 8.500 ft at the top and 30.042 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 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	212.625-202.458			8.500	1	10.167
T2	202.458-182.292			8.542	1	20.167
T3	182.292-162.104			8.625	1	20.188
T4	162.104-141.896			10.708	1	20.208
T5	141.896-121.688			12.792	1	20.208
T6	121.688-101.479			15.042	1	20.208
T7	101.479-81.271			17.542	1	20.208
T8	81.271-61.000			20.042	1	20.271
T9	61.000-40.667			22.677	1	20.333
T10	40.667-20.333			25.177	1	20.333
T11	20.333-0.000			27.833	1	20.333

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	212.625-202.458	5.083	K Brace Down	No	Yes	0.000	0.000
T2	202.458-182.292	6.722	K Brace Down	No	Yes	0.000	0.000
T3	182.292-162.104	6.729	K Brace Down	No	Yes	0.000	0.000
T4	162.104-141.896	6.736	K Brace Down	No	Yes	0.000	0.000

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
T5	141.896-121.688	10.104	K Brace Down	No	Yes	0.000	0.000
T6	121.688-101.479	10.104	K Brace Down	No	Yes	0.000	0.000
T7	101.479-81.271	10.104	K Brace Down	No	Yes	0.000	0.000
T8	81.271-61.000	10.135	K Brace Down	No	Yes	0.000	0.000
T9	61.000-40.667	10.167	K Brace Down	No	Yes	0.000	0.000
T10	40.667-20.333	20.333	K1 Down	No	Yes	0.000	0.000
T11	20.333-0.000	20.250	K1 Down	No	Yes	0.000	1.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 212.625-202.458	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 202.458-182.292	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 182.292-162.104	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 162.104-141.896	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.896-121.688	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 121.688-101.479	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 101.479-81.271	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 81.271-61.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 61.000-40.667	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 40.667-20.333	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	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 212.625-202.458	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 202.458-182.292	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 182.292-162.104	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T4 162.104-141.896	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.896-121.688	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T6 121.688-101.479	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 101.479-81.271	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 81.271-61.000	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 61.000-40.667	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 40.667-20.333	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	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
T1 212.625-202.458	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 202.458-182.292	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 182.292-162.104	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 162.104-141.896	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 141.896-121.688	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 121.688-101.479	Single Angle		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 101.479-81.271	Single Angle		A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 81.271-61.000	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 61.000-40.667	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 40.667-20.333	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T10 40.667-20.333	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
		Hip Diagonal		ROHN 2.5 STD	1
T11	A36	Horizontal (1)	Pipe	ROHN 1.5 STD	1
20.333-0.000	(36 ksi)	Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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 212.625-202.458	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T2 202.458-182.292	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T3 182.292-162.104	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T4 162.104-141.896	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T5 141.896-121.688	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T6 121.688-101.479	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T7 101.479-81.271	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T8 81.271-61.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T9 61.000-40.667	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T10 40.667-20.333	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000
T11 20.333-0.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	30.000	30.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 212.625-202.4	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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
58																	
T2	Yes	No	1	1		1		1		1		1		1		1	
202.458-182.292				1		1		1		1		1		1		1	
T3	Yes	No	1	1		1		1		1		1		1		1	
182.292-162.104				1		1		1		1		1		1		1	
T4	Yes	No	1	1		1		1		1		1		1		1	
162.104-141.896				1		1		1		1		1		1		1	
T5	Yes	No	1	1		1		1		1		1		1		1	
141.896-121.688				1		1		1		1		1		1		1	
T6	Yes	No	1	1		1		1		1		1		1		1	
121.688-101.479				1		1		1		1		1		1		1	
T7	Yes	No	1	1		1		1		1		1		1		1	
101.479-81.271				1		1		1		1		1		1		1	
T8	Yes	No	1	1		1		1		1		1		1		1	
81.271-61.000				1		1		1		1		1		1		1	
T9	Yes	No	1	1		1		1		1		1		1		1	
61.000-40.667				1		1		1		1		1		1		1	
T10	No	No	1	1		1		1		1		1		1		1	
40.667-20.333				1		1		1		1		1		1		1	
T11	No	No	1	1		1		1		1		1		1		1	
20.333-0.000				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	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	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
212.625-202.458														
T2	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
202.458-182.292														
T3	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
182.292-162.104														
T4	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
162.104-141.896														
T5	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
141.896-121.688														

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
T6 121.688-101.479	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T7 101.479-81.271	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T8 81.271-61.000	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T9 61.000-40.667	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T10 40.667-20.333	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T11 20.333-0.000	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	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 212.625-202.458	Flange	0.750 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T2 202.458-182.292	Flange	0.875 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T3 182.292-162.104	Flange	1.000 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T4 162.104-141.896	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T5 141.896-121.688	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T6 121.688-101.479	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T7 101.479-81.271	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T8 81.271-61.000	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T9 61.000-40.667	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T10 40.667-20.333	Flange	1.000 A325N	8	0.750 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.750 A325N	2	0.625 A325X	0
T11 20.333-0.000	Flange	1.000 A354-BC	10	0.750 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.750 A325N	2	0.625 A325X	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") (E)	A	Yes	Ar (CfAe)	51.000 - 0.000	0.000	0.46	1	1	0.630	0.630		0.000
HB114-1-08U4-M5J(1 1/4") (E)	A	Yes	Ar (CfAe)	199.000 - 0.000	0.000	0.42	4	4	0.850 0.750	1.540		0.001
Feedline Ladder (Af) (E)	A	Yes	Af (CfAe)	199.000 - 0.000	0.000	0.43	1	1	3.000	3.000	12.000	0.008
LDF5-50A(7/8") (E)	A	Yes	Ar (CfAe)	128.000 - 0.000	0.000	-0.4	5	5	1.000	1.090		0.000
LDF5-50A(7/8") (E)	A	Yes	Ar (CfAe)	145.000 - 128.000	0.000	-0.4	4	4	1.000	1.090		0.000
LDF5-50A(7/8") (E)	A	Yes	Ar (CfAe)	147.000 - 145.000	0.000	-0.4	3	3	1.000	1.090		0.000
LDF5-50A(7/8") (E)	A	Yes	Ar (CfAe)	164.000 - 147.000	0.000	-0.4	2	2	1.000	1.090		0.000
LDF5-50A(7/8") (E)	A	Yes	Ar (CfAe)	167.000 - 164.000	0.000	-0.4	1	1	1.000	1.090		0.000
LDF2-50(3/8") (E)	A	Yes	Ar (CfAe)	162.000 - 0.000	0.000	-0.48	1	1	0.440	0.440		0.000
CR 50 1873(1-5/8") (E)	A	Yes	Ar (CfAe)	189.000 - 0.000	0.000	-0.44	12	6	0.850 0.750	1.980		0.001
6-8AWG 3 PAIR(7/8") (E)	A	Yes	Ar (CfAe)	189.000 - 0.000	0.000	-0.37	2	2	0.850 0.750	0.900		0.001
A-DQZNB2Yn1750 N(17/64") (E)	A	Yes	Ar (CfAe)	189.000 - 0.000	1.000	-0.37	1	1	0.276	0.276		0.000
LDF1-50A(1/4") (E)	A	Yes	Ar (CfAe)	175.000 - 0.000	0.000	-0.47	4	2	0.345	0.345		0.000
Feedline Ladder (Af) (E)	A	Yes	Af (CfAe)	189.000 - 0.000	0.000	-0.4	1	1	3.000	3.000	12.000	0.008
*******												
Safety Line 3/8 (E)	A	No	Ar (Leg)	212.625 - 0.000	0.000	0	1	1	0.375	0.375		0.000
*******												
LDF7-50A(1-5/8") (5(1-1/4)E+7(1-5/8)E)	B	Yes	Ar (CfAe)	139.000 - 0.000	0.000	-0.45	12	6	0.850 0.750	1.980		0.001
LDF5-50A(7/8") (E)	B	Yes	Ar (CfAe)	139.000 - 0.000	0.000	-0.41	3	2	0.500	1.090		0.000
Feedline	B	Yes	Af (CfAe)	139.000 - 0.000	0.000	-0.45	1	1	3.000	3.000	12.000	0.008

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
Ladder (Af) (E)												
LDF6-50A(1-1/4") (AB)	B	Yes	Ar (CfAe)	175.000 - 0.000	0.000	0.45	12	12	1.000 1.550	1.550		0.001
Feedline Ladder (Af) (AB)	B	Yes	Af (CfAe)	175.000 - 0.000	0.000	0.45	1	1	3.000	3.000	12.000	0.008
*******												
AVA7-50(1-5/8) (9(1-5/8)E+1(1-1/4)E)	C	Yes	Ar (CfAe)	208.000 - 0.000	0.000	0.45	10	6	0.750 0.500	2.010		0.001
AVA7-50(1-5/8) (9(1-5/8)E+2P(1-5/8))	C	Yes	Ar (CfAe)	208.000 - 0.000	0.000	0.38	11	6	0.750 0.500	2.010		0.001
Feedline Ladder (Af) (E)	C	Yes	Af (CfAe)	208.000 - 0.000	0.000	0.43	1	1	3.000	3.000	12.000	0.008
AVA7-50(1-5/8) (E)	C	Yes	Ar (CfAe)	183.000 - 0.000	0.000	-0.45	6	6	1.000 2.010	2.010		0.001
Feedline Ladder (Af) (E)	C	Yes	Af (CfAe)	183.000 - 0.000	0.000	-0.45	1	1	3.000	3.000	12.000	0.008
*******												

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	212.625-202.458	A	0.318	0.000	0.000	0.000	0.002
		B	0.318	0.000	0.000	0.000	0.000
		C	11.139	1.385	0.000	0.000	0.128
T2	202.458-182.292	A	17.009	5.854	0.000	0.000	0.349
		B	0.630	0.000	0.000	0.000	0.000
		C	41.247	5.219	0.000	0.000	0.475
T3	182.292-162.104	A	35.830	10.094	0.000	0.000	0.665
		B	20.619	3.224	0.000	0.000	0.210
		C	60.865	10.094	0.000	0.000	0.721
T4	162.104-141.896	A	40.823	10.104	0.000	0.000	0.683
		B	31.954	5.052	0.000	0.000	0.330
		C	60.928	10.104	0.000	0.000	0.721
T5	141.896-121.688	A	44.325	10.104	0.000	0.000	0.696
		B	52.239	9.380	0.000	0.000	0.663

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
		C	60.928	10.104	0.000	0.000	0.721
T6	121.688-101.479	A	45.588	10.104	0.000	0.000	0.700
		B	55.632	10.104	0.000	0.000	0.718
		C	60.928	10.104	0.000	0.000	0.721
T7	101.479-81.271	A	45.588	10.104	0.000	0.000	0.700
		B	55.632	10.104	0.000	0.000	0.718
		C	60.928	10.104	0.000	0.000	0.721
T8	81.271-61.000	A	45.729	10.135	0.000	0.000	0.702
		B	55.804	10.135	0.000	0.000	0.721
		C	61.117	10.135	0.000	0.000	0.724
T9	61.000-40.667	A	46.412	10.167	0.000	0.000	0.706
		B	55.976	10.167	0.000	0.000	0.723
		C	61.305	10.167	0.000	0.000	0.726
T10	40.667-20.333	A	46.937	10.167	0.000	0.000	0.708
		B	55.976	10.167	0.000	0.000	0.723
		C	61.305	10.167	0.000	0.000	0.726
T11	20.333-0.000	A	46.937	10.167	0.000	0.000	0.708
		B	55.976	10.167	0.000	0.000	0.723
		C	61.305	10.167	0.000	0.000	0.726

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	212.625-202.458	A	0.935	1.902	0.000	0.000	0.000	0.017
		B		1.902	0.000	0.000	0.000	0.000
		C		3.584	14.707	0.000	0.000	0.431
T2	202.458-182.292	A	0.927	13.342	27.137	0.000	0.000	0.916
		B		3.745	0.000	0.000	0.000	0.000
		C		13.213	54.640	0.000	0.000	1.588
T3	182.292-162.104	A	0.914	27.441	54.078	0.000	0.000	1.874
		B		7.339	34.678	0.000	0.000	0.688
		C		19.375	85.946	0.000	0.000	2.313
T4	162.104-141.896	A	0.901	35.950	59.111	0.000	0.000	2.013
		B		9.310	54.312	0.000	0.000	1.069
		C		19.257	85.974	0.000	0.000	2.298
T5	141.896-121.688	A	0.886	35.558	65.752	0.000	0.000	2.081
		B		18.747	83.017	0.000	0.000	2.078
		C		19.103	85.905	0.000	0.000	2.278
T6	121.688-101.479	A	0.868	35.086	68.093	0.000	0.000	2.089
		B		20.106	87.746	0.000	0.000	2.226
		C		18.926	85.826	0.000	0.000	2.255
T7	101.479-81.271	A	0.847	34.532	68.001	0.000	0.000	2.061
		B		19.829	87.654	0.000	0.000	2.200
		C		18.718	85.734	0.000	0.000	2.228
T8	81.271-61.000	A	0.822	33.961	68.098	0.000	0.000	2.034
		B		19.552	87.812	0.000	0.000	2.174
		C		18.522	85.886	0.000	0.000	2.202
T9	61.000-40.667	A	0.790	35.087	68.161	0.000	0.000	2.012
		B		19.171	87.936	0.000	0.000	2.139
		C		18.248	86.004	0.000	0.000	2.167
T10	40.667-20.333	A	0.750	35.711	67.981	0.000	0.000	1.972
		B		18.630	87.755	0.000	0.000	2.089
		C		17.842	85.824	0.000	0.000	2.115
T11	20.333-0.000	A	0.750	35.711	67.981	0.000	0.000	1.972
		B		18.630	87.755	0.000	0.000	2.089
		C		17.843	85.824	0.000	0.000	2.115

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	212.625-202.458	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.149	3.160	0.000	0.000
T2	202.458-182.292	A	1.739	5.457	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.634	9.914	0.000	0.000
T3	182.292-162.104	A	3.302	10.666	0.000	0.000
		B	1.692	5.204	0.000	0.000
		C	5.172	14.340	0.000	0.000
T4	162.104-141.896	A	3.692	12.060	0.000	0.000
		B	2.670	7.871	0.000	0.000
		C	5.214	13.847	0.000	0.000
T5	141.896-121.688	A	3.245	9.970	0.000	0.000
		B	3.679	10.002	0.000	0.000
		C	4.285	10.702	0.000	0.000
T6	121.688-101.479	A	3.113	9.464	0.000	0.000
		B	3.681	9.900	0.000	0.000
		C	4.016	9.942	0.000	0.000
T7	101.479-81.271	A	3.600	10.050	0.000	0.000
		B	4.257	10.542	0.000	0.000
		C	4.645	10.588	0.000	0.000
T8	81.271-61.000	A	3.466	9.515	0.000	0.000
		B	4.099	10.017	0.000	0.000
		C	4.472	10.060	0.000	0.000
T9	61.000-40.667	A	3.403	9.215	0.000	0.000
		B	3.984	9.564	0.000	0.000
		C	4.347	9.606	0.000	0.000
T10	40.667-20.333	A	3.815	10.568	0.000	0.000
		B	4.426	10.846	0.000	0.000
		C	4.828	10.894	0.000	0.000
T11	20.333-0.000	A	3.636	10.065	0.000	0.000
		B	4.218	10.331	0.000	0.000
		C	4.602	10.376	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	212.625-202.458	-9.525	6.717	-5.599	2.883
T2	202.458-182.292	-15.940	6.338	-10.567	3.268
T3	182.292-162.104	-5.369	12.469	-2.561	8.698
T4	162.104-141.896	-3.729	14.986	-1.080	11.021
T5	141.896-121.688	-4.194	8.873	-1.921	7.477
T6	121.688-101.479	-5.005	8.950	-2.544	7.812
T7	101.479-81.271	-5.421	9.662	-2.761	8.593
T8	81.271-61.000	-5.694	10.127	-2.974	9.274
T9	61.000-40.667	-6.264	10.881	-3.290	9.740
T10	40.667-20.333	-6.738	11.448	-3.432	9.941
T11	20.333-0.000	-7.265	12.330	-3.728	10.723

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 6' (E)	A	From Leg	0.000 0.000 3.000	0.000	213.625	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.375 0.989 1.619 2.464 4.076	0.375 0.989 1.619 2.464 4.076	0.033 0.037 0.045 0.074 0.184
Climb Leg Extension (E)	A	From Leg	0.000 0.000 2.000	0.000	212.625	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.495 1.803 2.119 2.780 4.344	1.495 1.803 2.119 2.780 4.344	0.025 0.038 0.054 0.098 0.235
Flash Beacon Lighting (E)	B	From Leg	0.000 0.000 2.500	0.000	212.625	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.700 3.100 3.500 4.300 5.900	2.700 3.100 3.500 4.300 5.900	0.050 0.070 0.090 0.130 0.210
4' x 2" Pipe Mount (E-For Beacon)	B	From Leg	0.000 0.000 2.000	0.000	212.625	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Side Lighting (E)	A	From Leg	0.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.133 0.194 0.267 0.444 0.933	0.133 0.194 0.267 0.444 0.933	0.005 0.007 0.010 0.019 0.054
Side Lighting (E)	B	From Leg	0.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.133 0.194 0.267 0.444 0.933	0.133 0.194 0.267 0.444 0.933	0.005 0.007 0.010 0.019 0.054
Side Lighting (E)	C	From Leg	0.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.133 0.194 0.267 0.444 0.933	0.133 0.194 0.267 0.444 0.933	0.005 0.007 0.010 0.019 0.054
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(2) LPA-80080/6CF w/ Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.564 5.105 5.612 6.651 8.834	10.728 11.990 12.968 14.980 19.217	0.046 0.113 0.187 0.363 0.857
(2) LPA-80080/6CF w/ Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.564 5.105 5.612 6.651 8.834	10.728 11.990 12.968 14.980 19.217	0.046 0.113 0.187 0.363 0.857
(2) LPA-80080/6CF w/ Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.564 5.105 5.612 6.651	10.728 11.990 12.968 14.980	0.046 0.113 0.187 0.363

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	8.834	19.217	0.857
DB-T1-6Z-8AB-0Z (E)	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455
(3) SBNHH-1D65B w/ Mount Pipe (P)	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
(3) SBNHH-1D65B w/ Mount Pipe (P)	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
(3) SBNHH-1D65B w/ Mount Pipe (P)	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
DB-B1-6C-12AB-0Z (P)	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.924 4.197 4.478 5.066 6.347	2.557 2.794 3.040 3.557 4.696	0.021 0.050 0.082 0.158 0.360
RRH2X60-PCS (P)	A	From Leg	4.000 0.000 1.000	0.000	208.000	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 0.000 1.000	0.000	208.000	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 0.000 1.000	0.000	208.000	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
RRH2x60-700 (P)	A	From Leg	4.000 0.000 1.000	0.000	208.000	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 0.000 1.000	0.000	208.000	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 0.000 1.000	0.000	208.000	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	A	From Leg	4.000	0.000	208.000	No Ice	3.957	1.816	0.060

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
(P)			0.000 1.000			1/2" Ice	4.272	2.075	0.083
						1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS (P)	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice	3.957	1.816	0.060
						1/2" Ice	4.272	2.075	0.083
						1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS (P)	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice	3.957	1.816	0.060
						1/2" Ice	4.272	2.075	0.083
						1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
Sector Mount [SM 510-3] (E)	C	None		0.000	208.000	No Ice	40.100	40.100	2.396
						1/2" Ice	57.330	57.330	3.089
						1" Ice	74.560	74.560	3.782
						2" Ice	109.020	109.020	5.167
						4" Ice	177.940	177.940	7.937
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APXVSPP18-C-A20 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVTM14-C-120 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	7.134	4.959	0.077
						1/2" Ice	7.662	5.754	0.131
						1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
APXVTM14-C-120 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	7.134	4.959	0.077
						1/2" Ice	7.662	5.754	0.131
						1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
APXVTM14-C-120 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	7.134	4.959	0.077
						1/2" Ice	7.662	5.754	0.131
						1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
1900MHz RRH (65MHz) (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084
						1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
1900MHz RRH (65MHz) (E)	B	From Leg	4.000 0.000	0.000	199.000	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084

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
			-1.000			1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
1900MHz RRH (65MHz) (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.698 2.936 3.183 3.703 4.846	2.771 3.011 3.260 3.784 4.935	0.060 0.084 0.111 0.176 0.354
800MHz 2X50W RRH W/FILTER (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
800MHz 2X50W RRH W/FILTER (E)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
800MHz 2X50W RRH W/FILTER (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
TD-RRH8x20-25 (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25 (E)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25 (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
(3) 4' x 2" Pipe Mount (E)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount (E)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount (E)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Sector Mount [SM 505-3] (E)	C	None		0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	34.860 49.790 64.720 94.580	34.860 49.790 64.720 94.580	1.725 2.317 2.909 4.092

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	154.300	154.300	6.458
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AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.744 6.198 6.661 7.618 9.668	4.015 4.633 5.276 6.678 9.744	0.035 0.080 0.131 0.254 0.610
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.744 6.198 6.661 7.618 9.668	4.015 4.633 5.276 6.678 9.744	0.035 0.080 0.131 0.254 0.610
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.744 6.198 6.661 7.618 9.668	4.015 4.633 5.276 6.678 9.744	0.035 0.080 0.131 0.254 0.610
(2) 7770.00 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) 7770.00 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) 7770.00 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.549 1.718 1.896 2.277 3.143	0.809 0.943 1.085 1.396 2.122	0.027 0.038 0.052 0.086 0.189
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.549 1.718 1.896 2.277 3.143	0.809 0.943 1.085 1.396 2.122	0.027 0.038 0.052 0.086 0.189
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.549 1.718 1.896 2.277 3.143	0.809 0.943 1.085 1.396 2.122	0.027 0.038 0.052 0.086 0.189
RRUS 11 (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS 11 (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310

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
RRUS 11 (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
(2) 7020.00 (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.119 0.171 0.232 0.380 0.779	0.204 0.279 0.363 0.556 1.046	0.002 0.005 0.009 0.022 0.071
(2) 7020.00 (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.119 0.171 0.232 0.380 0.779	0.204 0.279 0.363 0.556 1.046	0.002 0.005 0.009 0.022 0.071
(2) 7020.00 (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.119 0.171 0.232 0.380 0.779	0.204 0.279 0.363 0.556 1.046	0.002 0.005 0.009 0.022 0.071
(2) LGP13519 (E)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.338 0.422 0.515 0.726 1.252	0.207 0.280 0.362 0.551 1.034	0.005 0.008 0.012 0.024 0.071
(2) LGP13519 (E)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.338 0.422 0.515 0.726 1.252	0.207 0.280 0.362 0.551 1.034	0.005 0.008 0.012 0.024 0.071
(2) LGP13519 (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.338 0.422 0.515 0.726 1.252	0.207 0.280 0.362 0.551 1.034	0.005 0.008 0.012 0.024 0.071
DC6-48-60-18-8F (E)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.467 1.667 1.878 2.333 3.378	1.467 1.667 1.878 2.333 3.378	0.019 0.037 0.057 0.105 0.239
RRUS 11 (R)	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS 11 (R)	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS 11 (R)	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
Sector Mount [SM 602-3] (E)	C	None		0.000	189.000	No Ice 1/2" Ice	33.110 44.900	33.110 44.900	1.541 2.159

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	56.690	56.690	2.777
						2" Ice	80.270	80.270	4.014
						4" Ice	127.430	127.430	6.487
*******									
APXV18-206517LS w/ Mount Pipe (E)	A	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.286 5.839 6.357 7.417 9.765	4.667 5.822 6.687 8.461 12.208	0.053 0.097 0.149 0.279 0.674
APXV18-206517LS w/ Mount Pipe (E)	B	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.286 5.839 6.357 7.417 9.765	4.667 5.822 6.687 8.461 12.208	0.053 0.097 0.149 0.279 0.674
APXV18-206517LS w/ Mount Pipe (E)	C	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.286 5.839 6.357 7.417 9.765	4.667 5.822 6.687 8.461 12.208	0.053 0.097 0.149 0.279 0.674
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(4) DB844H90E-XY w/ Mount Pipe (AB)	A	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.072 0.117 0.228 0.557
(4) DB844H90E-XY w/ Mount Pipe (AB)	B	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.072 0.117 0.228 0.557
(4) DB844H90E-XY w/ Mount Pipe (AB)	C	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.299 3.690 4.119 5.007 6.920	4.921 5.596 6.284 7.712 10.833	0.032 0.072 0.117 0.228 0.557
6' x 2" Mount Pipe (E-Dish Mount)	C	From Leg	2.000 0.000 4.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E-Dish Mount)	C	From Leg	2.000 0.000 4.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Sector Mount [SM 510-3] (E)	C	None		0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	40.100 57.330 74.560 109.020 177.940	40.100 57.330 74.560 109.020 177.940	2.396 3.089 3.782 5.167 7.937
*******									
1151-3 (E)	A	From Leg	6.000 0.000 6.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.180 5.731 7.299 10.485 14.755	4.180 5.731 7.299 10.485 14.755	0.016 0.047 0.087 0.197 0.541
Side Arm Mount [SO 308-1]	A	From Leg	3.000	0.000	167.000	No Ice	0.980	3.030	0.053

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)			0.000 0.000			1/2" Ice	1.700	5.220	0.079
						1" Ice	2.420	7.410	0.105
						2" Ice	3.860	11.790	0.156
						4" Ice	6.740	20.550	0.259
*******									
1151-3	B	From Leg	6.000	0.000	164.000	No Ice	4.180	4.180	0.016
(E)			0.000			1/2" Ice	5.731	5.731	0.047
			9.000			1" Ice	7.299	7.299	0.087
						2" Ice	10.485	10.485	0.197
						4" Ice	14.755	14.755	0.541
Side Arm Mount [SO 308-1]	B	From Leg	3.000	0.000	164.000	No Ice	0.980	3.030	0.053
(E)			0.000			1/2" Ice	1.700	5.220	0.079
			0.000			1" Ice	2.420	7.410	0.105
						2" Ice	3.860	11.790	0.156
						4" Ice	6.740	20.550	0.259
*******									
SD310-HL	A	From Leg	6.000	0.000	162.000	No Ice	1.107	1.107	6.500
(E)			0.000			1/2" Ice	1.357	1.357	6.510
			-2.000			1" Ice	1.617	1.617	6.524
						2" Ice	2.167	2.167	6.559
						4" Ice	3.578	3.578	6.674
Side Arm Mount [SO 308-1]	A	From Leg	3.000	0.000	162.000	No Ice	0.980	3.030	0.053
(E)			0.000			1/2" Ice	1.700	5.220	0.079
			0.000			1" Ice	2.420	7.410	0.105
						2" Ice	3.860	11.790	0.156
						4" Ice	6.740	20.550	0.259
*******									
1151-3	A	From Leg	6.000	0.000	147.000	No Ice	4.180	4.180	0.016
(E)			0.000			1/2" Ice	5.731	5.731	0.047
			6.000			1" Ice	7.299	7.299	0.087
						2" Ice	10.485	10.485	0.197
						4" Ice	14.755	14.755	0.541
Side Arm Mount [SO 308-1]	A	From Leg	3.000	0.000	147.000	No Ice	0.980	3.030	0.053
(E)			0.000			1/2" Ice	1.700	5.220	0.079
			0.000			1" Ice	2.420	7.410	0.105
						2" Ice	3.860	11.790	0.156
						4" Ice	6.740	20.550	0.259
*******									
SD310-HL	B	From Leg	6.000	0.000	145.000	No Ice	1.107	1.107	6.500
(E)			0.000			1/2" Ice	1.357	1.357	6.510
			3.000			1" Ice	1.617	1.617	6.524
						2" Ice	2.167	2.167	6.559
						4" Ice	3.578	3.578	6.674
Side Arm Mount [SO 308-1]	B	From Leg	3.000	0.000	145.000	No Ice	0.980	3.030	0.053
(E)			0.000			1/2" Ice	1.700	5.220	0.079
			0.000			1" Ice	2.420	7.410	0.105
						2" Ice	3.860	11.790	0.156
						4" Ice	6.740	20.550	0.259
*******									
ERICSSON AIR 21 B2A	A	From Leg	2.000	0.000	139.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			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	B	From Leg	2.000	0.000	139.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	C	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	A	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	B	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	C	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
KRY 112 144/1 (E)	A	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.204 0.273 0.351 0.533 0.999	0.011 0.014 0.019 0.032 0.082
KRY 112 144/1 (E)	B	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.204 0.273 0.351 0.533 0.999	0.011 0.014 0.019 0.032 0.082
KRY 112 144/1 (E)	C	From Leg	2.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.204 0.273 0.351 0.533 0.999	0.011 0.014 0.019 0.032 0.082
Side Arm Mount [SO 104-3] (E)	C	None		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.300 4.130 4.960 6.620 9.940	3.300 4.130 4.960 6.620 9.940	0.287 0.317 0.347 0.407 0.527
*******									
1142-2C (E)	A	From Leg	6.000 0.000 4.000	0.000	128.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.092 3.374 4.673 7.320 10.794	2.092 3.374 4.673 7.320 10.794	0.024 0.041 0.066 0.140 0.392
Side Arm Mount [SO 308-1] (E)	A	From Leg	3.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.980 1.700 2.420 3.860 6.740	3.030 5.220 7.410 11.790 20.550	0.053 0.079 0.105 0.156 0.259
*******									
GPS_A (E)	C	From Leg	2.000 0.000 0.000	0.000	51.000	No Ice 1/2" Ice 1" Ice	0.297 0.374 0.459	0.297 0.374 0.459	0.001 0.005 0.010

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
Side Arm Mount [SO 701-1] (E)	C	From Leg	1.000 0.000 0.000	0.000	51.000	No Ice	0.850	1.670	0.065
						1/2" Ice	1.140	2.340	0.079
						1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
*******									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HPD2-23 (E)	C	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 4.000	74.000		175.000	2.000	No Ice	3.142	0.027
									1/2" Ice	3.409	0.044
									1" Ice	3.676	0.062
									2" Ice	4.211	0.097
									4" Ice	5.280	0.167
HPD2-23 (E)	C	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 4.000	-90.000		175.000	2.000	No Ice	3.142	0.027
									1/2" Ice	3.409	0.044
									1" Ice	3.676	0.062
									2" Ice	4.211	0.097
									4" Ice	5.280	0.167
*******											

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	212.625 - 202.458	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	23	-3.590	0.083	-0.000
			Max. Mx	4	-0.635	0.589	0.007
			Max. My	5	-1.367	0.003	-0.617
			Max. Vy	4	2.091	-0.368	0.007
			Max. Vx	13	-2.103	-0.002	0.365
		Diagonal	Max Tension	3	3.930	0.000	0.000
			Max. Compression	3	-3.994	0.000	0.000
			Max. Mx	14	-0.052	0.027	0.000
			Max. Vy	14	-0.016	0.000	0.000
		Horizontal	Max Tension	8	2.880	0.000	0.000
			Max. Compression	2	-2.885	-0.009	-0.004
			Max. Mx	25	0.054	-0.017	-0.002
			Max. My	4	0.036	-0.009	-0.008
			Max. Vy	25	-0.017	-0.017	-0.002
			Max. Vx	4	-0.002	-0.009	-0.008
		Top Girt	Max Tension	8	0.262	-0.005	0.000
			Max. Compression	2	-0.263	0.000	0.000
			Max. Mx	21	-0.041	-0.014	-0.000
			Max. My	10	0.139	-0.004	0.001
			Max. Vy	21	0.016	-0.014	-0.000
			Max. Vx	10	-0.000	0.000	0.000
		Inner Bracing	Max Tension	2	0.005	0.000	0.000
			Max. Compression	2	-0.005	0.000	0.000
			Max. Mx	14	-0.000	-0.014	0.000
			Max. Vy	14	0.013	0.000	0.000
T2	202.458 - 182.292	Leg	Max Tension	12	23.524	0.152	0.027
			Max. Compression	10	-31.589	0.300	0.015
			Max. Mx	4	3.136	1.571	0.008

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	7	-2.887	-0.001	1.602
			Max. Vy	4	-1.153	0.151	0.015
			Max. Vx	13	1.222	-0.001	-0.110
		Diagonal	Max Tension	9	11.033	0.000	0.000
			Max. Compression	9	-11.098	0.000	0.000
			Max. Mx	14	-0.047	0.033	0.000
			Max. Vy	14	-0.016	0.000	0.000
		Horizontal	Max Tension	9	6.042	0.000	0.000
			Max. Compression	3	-6.041	-0.010	0.000
			Max. Mx	25	-0.416	-0.024	-0.003
			Max. My	10	0.784	0.002	0.012
			Max. Vy	25	0.019	-0.024	-0.003
			Max. Vx	10	-0.003	0.000	0.000
		Inner Bracing	Max Tension	10	0.007	0.000	0.000
			Max. Compression	4	-0.007	0.000	0.000
			Max. Mx	14	-0.000	-0.014	0.000
			Max. Vy	14	0.013	0.000	0.000
T3	182.292 - 162.104	Leg	Max Tension	8	64.189	-0.226	0.042
			Max. Compression	10	-77.276	0.250	0.089
			Max. Mx	8	50.021	-0.378	0.011
			Max. My	13	-4.880	-0.023	0.447
			Max. Vy	4	-1.013	-0.358	-0.053
			Max. Vx	13	1.064	-0.023	0.447
		Diagonal	Max Tension	5	10.959	0.000	0.000
			Max. Compression	5	-11.031	0.000	0.000
			Max. Mx	14	-0.066	0.043	0.000
			Max. Vy	14	-0.020	0.000	0.000
		Horizontal	Max Tension	11	6.827	-0.011	0.000
			Max. Compression	5	-6.833	0.000	0.000
			Max. Mx	25	-0.453	-0.027	-0.003
			Max. My	6	1.332	0.003	0.012
			Max. Vy	25	0.021	-0.027	-0.003
			Max. Vx	2	-0.003	0.003	0.012
		Inner Bracing	Max Tension	2	0.005	0.000	0.000
			Max. Compression	4	-0.007	0.000	0.000
			Max. Mx	14	-0.002	-0.018	0.000
			Max. Vy	14	-0.015	0.000	0.000
T4	162.104 - 141.896	Leg	Max Tension	4	105.424	-1.159	-0.058
			Max. Compression	2	-127.355	0.306	-0.001
			Max. Mx	12	94.121	-1.479	0.032
			Max. My	3	-15.840	-0.331	-1.144
			Max. Vy	8	-0.669	-0.226	0.042
			Max. Vx	3	0.237	-0.331	-1.144
		Diagonal	Max Tension	9	10.643	0.000	0.000
			Max. Compression	9	-10.736	0.000	0.000
			Max. Mx	14	-0.205	0.055	0.000
			Max. Vy	14	-0.024	0.000	0.000
		Horizontal	Max Tension	5	7.379	0.000	0.000
			Max. Compression	11	-7.374	-0.021	-0.000
			Max. Mx	17	-0.674	-0.049	-0.004
			Max. My	6	0.695	0.003	0.017
			Max. Vy	17	0.031	-0.049	-0.004
			Max. Vx	6	-0.003	0.000	0.000
		Inner Bracing	Max Tension	6	0.006	0.000	0.000
			Max. Compression	8	-0.008	0.000	0.000
			Max. Mx	14	-0.003	-0.026	0.000
			Max. Vy	14	0.017	0.000	0.000
T5	141.896 - 121.688	Leg	Max Tension	4	133.106	-0.982	0.007

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	-158.247	0.667	-0.041
			Max. Mx	12	105.926	-1.479	0.032
			Max. My	3	-16.217	-0.331	-1.144
			Max. Vy	12	-0.466	-1.479	0.032
			Max. Vx	7	-0.435	0.002	-1.142
		Diagonal	Max Tension	11	13.591	0.000	0.000
			Max. Compression	11	-13.735	0.000	0.000
			Max. Mx	14	-0.042	0.120	0.000
			Max. Vy	14	-0.038	0.000	0.000
		Horizontal	Max Tension	5	8.151	0.000	0.000
			Max. Compression	11	-8.147	-0.028	-0.000
			Max. Mx	17	-0.765	-0.064	-0.004
			Max. My	10	1.250	0.004	0.017
			Max. Vy	17	-0.035	-0.064	-0.004
			Max. Vx	10	-0.003	0.004	0.017
		Inner Bracing	Max Tension	10	0.003	0.000	0.000
			Max. Compression	8	-0.008	0.000	0.000
			Max. Mx	14	-0.004	-0.034	0.000
			Max. Vy	14	0.020	0.000	0.000
T6	121.688 - 101.479	Leg	Max Tension	4	162.795	-0.698	-0.031
			Max. Compression	6	-192.286	0.967	-0.098
			Max. Mx	4	162.423	-0.993	-0.040
			Max. My	7	-10.258	-0.030	-1.033
			Max. Vy	4	0.121	-0.993	-0.040
			Max. Vx	13	-0.141	-0.027	1.031
		Diagonal	Max Tension	11	12.168	0.000	0.000
			Max. Compression	11	-12.348	0.000	0.000
			Max. Mx	14	-0.079	0.148	0.000
			Max. Vy	14	-0.044	0.000	0.000
		Horizontal	Max Tension	5	8.030	0.000	0.000
			Max. Compression	11	-8.027	-0.035	-0.000
			Max. Mx	17	0.934	-0.073	-0.003
			Max. My	10	0.277	-0.008	0.014
			Max. Vy	17	-0.039	-0.073	-0.003
			Max. Vx	10	0.002	0.000	0.000
		Inner Bracing	Max Tension	10	0.001	0.000	0.000
			Max. Compression	12	-0.007	0.000	0.000
			Max. Mx	14	-0.006	-0.064	0.000
			Max. Vy	14	0.032	0.000	0.000
T7	101.479 - 81.2708	Leg	Max Tension	4	188.454	-0.661	-0.024
			Max. Compression	6	-222.678	0.833	-0.064
			Max. Mx	4	175.837	-0.993	-0.040
			Max. My	7	-11.217	-0.030	-1.033
			Max. Vy	4	-0.121	-0.993	-0.040
			Max. Vx	13	0.139	-0.027	1.031
		Diagonal	Max Tension	11	11.939	0.000	0.000
			Max. Compression	11	-12.229	0.000	0.000
			Max. Mx	14	-0.161	0.222	0.000
			Max. Vy	14	-0.062	0.000	0.000
		Horizontal	Max Tension	5	8.628	0.000	0.000
			Max. Compression	11	-8.625	-0.074	-0.000
			Max. Mx	17	1.065	-0.135	-0.005
			Max. My	10	1.043	-0.020	0.018
			Max. Vy	17	0.061	-0.135	-0.005
			Max. Vx	10	-0.002	-0.020	0.018
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-0.009	0.000	0.000
			Max. Mx	14	-0.008	-0.099	0.000
			Max. Vy	14	0.042	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
T8	81.2708 - 61	Leg	Max Tension	4	211.728	-1.366	-0.021
			Max. Compression	6	-251.140	0.787	-0.056
			Max. Mx	4	200.234	-1.366	-0.021
			Max. My	7	-14.400	-0.041	-1.260
			Max. Vy	4	0.157	-1.366	-0.021
			Max. Vx	7	0.159	-0.041	-1.260
		Diagonal	Max Tension	11	11.539	0.000	0.000
			Max. Compression	11	-11.941	0.000	0.000
			Max. Mx	14	-0.230	0.265	0.000
			Max. Vy	14	-0.070	0.000	0.000
		Horizontal	Max Tension	5	8.975	0.000	0.000
			Max. Compression	11	-8.973	-0.091	-0.000
			Max. Mx	17	1.197	-0.158	-0.004
			Max. My	10	0.044	-0.046	0.016
			Max. Vy	17	-0.067	-0.158	-0.004
			Max. Vx	10	0.002	-0.046	0.016
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-0.010	0.000	0.000
			Max. Mx	14	-0.010	-0.165	0.000
			Max. Vy	14	-0.062	0.000	0.000
T9	61 - 40.6667	Leg	Max Tension	4	233.992	-1.918	-0.005
			Max. Compression	6	-278.843	-2.714	-0.208
			Max. Mx	6	-278.843	-2.714	-0.208
			Max. My	13	-19.167	-0.504	3.419
			Max. Vy	6	0.552	2.132	-0.009
			Max. Vx	13	-0.379	-0.504	3.419
		Diagonal	Max Tension	11	12.491	0.000	0.000
			Max. Compression	11	-12.958	0.000	0.000
			Max. Mx	14	-0.285	0.308	0.000
			Max. Vy	14	0.076	0.000	0.000
		Horizontal	Max Tension	5	10.182	0.000	0.000
			Max. Compression	11	-10.180	-0.113	-0.000
			Max. Mx	21	1.312	-0.189	-0.004
			Max. My	10	0.954	-0.072	0.015
			Max. Vy	21	-0.073	-0.189	-0.004
			Max. Vx	10	-0.001	-0.072	0.015
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-0.010	0.000	0.000
			Max. Mx	14	-0.010	-0.202	0.000
			Max. Vy	14	0.068	0.000	0.000
T10	40.6667 - 20.3333	Leg	Max Tension	4	243.034	1.637	-0.084
			Max. Compression	6	-290.925	-8.062	-0.433
			Max. Mx	6	-290.500	9.266	0.322
			Max. My	13	-21.268	-1.060	5.404
			Max. Vy	6	1.763	9.266	0.322
			Max. Vx	13	-0.911	-1.060	5.404
		Diagonal	Max Tension	11	17.335	-0.157	-0.036
			Max. Compression	11	-18.281	0.000	0.000
			Max. Mx	12	12.019	-0.193	0.068
			Max. My	11	-18.200	0.017	-0.108
			Max. Vy	25	-0.052	-0.135	0.010
			Max. Vx	11	0.009	0.000	0.000
		Horizontal	Max Tension	5	10.024	0.000	0.000
			Max. Compression	11	-10.022	-0.171	-0.000
			Max. Mx	21	-1.415	-0.282	-0.006
			Max. My	10	0.252	-0.089	0.023
			Max. Vy	21	0.097	-0.282	-0.006
			Max. Vx	10	0.002	-0.095	0.023
		Redund Horz 1 Bracing	Max Tension	6	5.053	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	6	-5.053	0.000	0.000
			Max. Mx	14	0.755	0.026	0.000
			Max. Vy	14	-0.017	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	6	4.667	0.000	0.000
			Max. Compression	6	-4.667	0.000	0.000
			Max. Mx	14	0.746	0.055	0.000
			Max. Vy	14	-0.019	0.000	0.000
		Redund Hip 1 Bracing	Max Tension	11	0.014	0.000	0.000
			Max. Compression	5	-0.026	0.000	0.000
			Max. Mx	14	-0.009	0.026	0.000
			Max. Vy	14	0.017	0.000	0.000
		Redund Hip Diagonal Bracing	Max Tension	6	0.058	0.000	0.000
			Max. Compression	12	-0.063	0.000	0.000
			Max. Mx	14	0.044	0.202	0.000
			Max. Vy	14	-0.053	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	19	-0.013	0.000	0.000
			Max. Mx	14	-0.012	0.235	0.000
			Max. Vy	14	-0.075	0.000	0.000
T11	20.3333 - 0	Leg	Max Tension	4	288.985	1.378	0.029
			Max. Compression	6	-347.984	0.000	0.000
			Max. Mx	6	-316.179	8.655	0.284
			Max. My	13	-23.272	-1.061	5.402
			Max. Vy	10	-17.678	0.000	0.000
			Max. Vx	13	-6.826	0.000	0.001
		Diagonal	Max Tension	11	20.378	-0.150	-0.030
			Max. Compression	11	-21.301	0.000	0.000
			Max. Mx	12	15.697	-0.187	0.065
			Max. My	11	-21.220	-0.009	-0.107
			Max. Vy	24	0.056	-0.145	-0.000
			Max. Vx	11	-0.008	0.000	0.000
		Horizontal	Max Tension	5	12.389	0.000	0.000
			Max. Compression	11	-12.387	-0.206	-0.000
			Max. Mx	21	1.727	-0.298	-0.007
			Max. My	10	1.022	-0.133	0.023
			Max. Vy	21	-0.104	-0.298	-0.007
			Max. Vx	10	0.002	0.000	0.000
		Redund Horz 1 Bracing	Max Tension	6	6.036	0.000	0.000
			Max. Compression	6	-6.036	0.000	0.000
			Max. Mx	14	0.891	0.032	0.000
			Max. Vy	14	-0.018	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	6	5.199	0.000	0.000
			Max. Compression	6	-5.199	0.000	0.000
			Max. Mx	14	0.813	0.064	0.000
			Max. Vy	14	-0.022	0.000	0.000
		Redund Hip 1 Bracing	Max Tension	11	0.014	0.000	0.000
			Max. Compression	5	-0.024	0.000	0.000
			Max. Mx	14	-0.007	0.032	0.000
			Max. Vy	14	-0.018	0.000	0.000
		Redund Hip Diagonal Bracing	Max Tension	6	0.058	0.000	0.000
			Max. Compression	12	-0.062	0.000	0.000
			Max. Mx	14	0.044	0.233	0.000
			Max. Vy	14	0.058	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	6	-0.013	0.000	0.000
			Max. Mx	14	-0.010	0.287	0.000
			Max. Vy	14	0.083	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	343.555	34.175	-19.318
	Max. H_x	10	343.555	34.175	-19.318
	Max. H_z	3	-246.122	-24.223	17.593
	Min. Vert	4	-287.381	-30.105	16.979
	Min. H_x	4	-287.381	-30.105	16.979
	Min. H_z	9	297.746	27.723	-19.603
Leg B	Max. Vert	6	346.206	-34.392	-18.954
	Max. H_x	12	-283.521	30.250	16.522
	Max. H_z	13	-242.305	24.543	16.841
	Min. Vert	12	-283.521	30.250	16.522
	Min. H_x	6	346.206	-34.392	-18.954
	Min. H_z	7	300.455	-28.106	-18.966
Leg A	Max. Vert	2	345.618	-0.425	39.212
	Max. H_x	11	28.923	5.498	2.077
	Max. H_z	2	345.618	-0.425	39.212
	Min. Vert	8	-283.270	0.475	-34.411
	Min. H_x	5	28.883	-5.434	2.067
	Min. H_z	8	-283.270	0.475	-34.411

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	83.723	0.000	0.000	-24.933	-48.947	0.000
Dead+Wind 0 deg - No Ice	83.723	0.009	-65.041	-8265.823	-51.701	-23.808
Dead+Wind 30 deg - No Ice	83.723	32.143	-55.598	-7093.843	-4136.692	-3.475
Dead+Wind 60 deg - No Ice	83.723	55.466	-31.928	-4088.042	-7111.573	17.898
Dead+Wind 90 deg - No Ice	83.723	64.313	0.004	-25.370	-8227.133	34.284
Dead+Wind 120 deg - No Ice	83.723	56.437	32.491	4089.289	-7201.245	41.946
Dead+Wind 150 deg - No Ice	83.723	32.118	55.515	7028.114	-4130.077	36.974
Dead+Wind 180 deg - No Ice	83.723	-0.001	63.836	8095.858	-47.593	23.118
Dead+Wind 210 deg - No Ice	83.723	-32.159	55.578	7040.526	4041.546	3.264
Dead+Wind 240 deg - No Ice	83.723	-56.491	32.553	4102.224	7114.150	-18.287
Dead+Wind 270 deg - No Ice	83.723	-64.300	-0.015	-26.406	8126.918	-34.254
Dead+Wind 300 deg - No Ice	83.723	-55.398	-31.894	-4080.069	7000.209	-40.676
Dead+Wind 330 deg - No Ice	83.723	-32.111	-55.517	-7078.203	4031.027	-36.974
Dead+Ice+Temp	153.436	0.000	0.000	28.197	16.837	0.000
Dead+Wind 0 deg+Ice+Temp	153.436	0.013	-19.940	-2441.776	14.519	-3.589
Dead+Wind 30 deg+Ice+Temp	153.436	9.334	-16.103	-1995.327	-1157.096	0.785
Dead+Wind 60 deg+Ice+Temp	153.436	15.774	-9.071	-1117.521	-1977.135	4.517
Dead+Wind 90 deg+Ice+Temp	153.436	18.655	-0.010	26.404	-2328.704	7.317
Dead+Wind 120 deg+Ice+Temp	153.436	17.324	9.954	1260.308	-2130.420	8.903
Dead+Wind 150 deg+Ice+Temp	153.436	9.310	16.074	2046.438	-1152.665	6.354

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 180 deg+Ice+Temp	153.436	-0.011	18.118	2315.470	18.837	3.072
Dead+Wind 210 deg+Ice+Temp	153.436	-9.337	16.098	2050.940	1191.391	-0.833
Dead+Wind 240 deg+Ice+Temp	153.436	-17.347	9.986	1266.170	2168.231	-5.348
Dead+Wind 270 deg+Ice+Temp	153.436	-18.652	0.007	29.558	2361.853	-7.310
Dead+Wind 300 deg+Ice+Temp	153.436	-15.748	-9.045	-1112.782	2006.067	-7.512
Dead+Wind 330 deg+Ice+Temp	153.436	-9.308	-16.074	-1990.094	1186.077	-6.354
Dead+Wind 0 deg - Service	83.723	0.003	-22.506	-2876.452	-49.900	-8.238
Dead+Wind 30 deg - Service	83.723	11.122	-19.238	-2470.923	-1463.392	-1.203
Dead+Wind 60 deg - Service	83.723	19.193	-11.048	-1430.853	-2492.762	6.193
Dead+Wind 90 deg - Service	83.723	22.254	0.001	-25.084	-2878.770	11.863
Dead+Wind 120 deg - Service	83.723	19.528	11.243	1398.673	-2523.791	14.514
Dead+Wind 150 deg - Service	83.723	11.113	19.210	2415.568	-1461.103	12.794
Dead+Wind 180 deg - Service	83.723	-0.000	22.089	2785.029	-48.479	7.999
Dead+Wind 210 deg - Service	83.723	-11.128	19.231	2419.863	1366.448	1.129
Dead+Wind 240 deg - Service	83.723	-19.547	11.264	1403.149	2429.633	-6.328
Dead+Wind 270 deg - Service	83.723	-22.249	-0.005	-25.443	2780.072	-11.853
Dead+Wind 300 deg - Service	83.723	-19.169	-11.036	-1428.094	2390.207	-14.075
Dead+Wind 330 deg - Service	83.723	-11.111	-19.210	-2465.511	1362.809	-12.794

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	-83.723	0.000	0.000	83.723	0.000	0.000%
2	0.009	-83.723	-65.041	-0.009	83.723	65.041	0.000%
3	32.143	-83.723	-55.598	-32.143	83.723	55.598	0.000%
4	55.466	-83.723	-31.928	-55.466	83.723	31.928	0.000%
5	64.313	-83.723	0.004	-64.313	83.723	-0.004	0.000%
6	56.437	-83.723	32.491	-56.437	83.723	-32.491	0.000%
7	32.118	-83.723	55.515	-32.118	83.723	-55.515	0.000%
8	-0.001	-83.723	63.836	0.001	83.723	-63.836	0.000%
9	-32.159	-83.723	55.578	32.159	83.723	-55.578	0.000%
10	-56.491	-83.723	32.553	56.491	83.723	-32.553	0.000%
11	-64.300	-83.723	-0.015	64.300	83.723	0.015	0.000%
12	-55.398	-83.723	-31.894	55.398	83.723	31.894	0.000%
13	-32.111	-83.723	-55.517	32.111	83.723	55.517	0.000%
14	0.000	-153.436	0.000	0.000	153.436	0.000	0.000%
15	0.013	-153.436	-19.940	-0.013	153.436	19.940	0.000%
16	9.334	-153.436	-16.103	-9.334	153.436	16.103	0.000%
17	15.774	-153.436	-9.071	-15.774	153.436	9.071	0.000%
18	18.655	-153.436	-0.010	-18.655	153.436	0.010	0.000%
19	17.324	-153.436	9.954	-17.324	153.436	-9.954	0.000%
20	9.310	-153.436	16.074	-9.310	153.436	-16.074	0.000%
21	-0.011	-153.436	18.118	0.011	153.436	-18.118	0.000%
22	-9.337	-153.436	16.098	9.337	153.436	-16.098	0.000%
23	-17.347	-153.436	9.986	17.347	153.436	-9.986	0.000%
24	-18.652	-153.436	0.007	18.652	153.436	-0.007	0.000%
25	-15.748	-153.436	-9.045	15.748	153.436	9.045	0.000%
26	-9.308	-153.436	-16.074	9.308	153.436	16.074	0.000%
27	0.003	-83.723	-22.506	-0.003	83.723	22.506	0.000%
28	11.122	-83.723	-19.238	-11.122	83.723	19.238	0.000%
29	19.193	-83.723	-11.048	-19.193	83.723	11.048	0.000%
30	22.254	-83.723	0.001	-22.254	83.723	-0.001	0.000%
31	19.528	-83.723	11.243	-19.528	83.723	-11.243	0.000%
32	11.113	-83.723	19.210	-11.113	83.723	-19.210	0.000%
33	-0.000	-83.723	22.089	0.000	83.723	-22.089	0.000%
34	-11.128	-83.723	19.231	11.128	83.723	-19.231	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
35	-19.547	-83.723	11.264	19.547	83.723	-11.264	0.000%
36	-22.249	-83.723	-0.005	22.249	83.723	0.005	0.000%
37	-19.169	-83.723	-11.036	19.169	83.723	11.036	0.000%
38	-11.111	-83.723	-19.210	11.111	83.723	19.210	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	6.302	29	0.269	0.049
T2	202.458 - 182.292	5.723	29	0.269	0.049
T3	182.292 - 162.104	4.562	29	0.255	0.044
T4	162.104 - 141.896	3.490	29	0.227	0.033
T5	141.896 - 121.688	2.563	29	0.191	0.025
T6	121.688 - 101.479	1.822	30	0.153	0.019
T7	101.479 - 81.2708	1.225	31	0.122	0.014
T8	81.2708 - 61	0.772	31	0.091	0.011
T9	61 - 40.6667	0.432	31	0.064	0.008
T10	40.6667 - 20.3333	0.197	35	0.038	0.006
T11	20.3333 - 0	0.065	35	0.019	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
213.625	Lightning Rod 5/8" x 6'	29	6.302	0.269	0.049	149146
212.625	Climb Leg Extension	29	6.302	0.269	0.049	149146
208.000	(2) LPA-80080/6CF w/ Mount Pipe	29	6.040	0.269	0.049	149146
199.000	APXVSPP18-C-A20 w/ Mount Pipe	29	5.523	0.268	0.048	150944
189.000	AM-X-CD-14-65-00T-RET w/ Mount Pipe	29	4.944	0.261	0.046	67577
183.000	APXV18-206517LS w/ Mount Pipe	29	4.602	0.255	0.044	38526
179.000	HPD2-23	29	4.379	0.251	0.042	37097
175.000	(4) DB844H90E-XY w/ Mount Pipe	29	4.160	0.246	0.040	37064
167.000	1151-3	29	3.738	0.235	0.036	32129
164.000	1151-3	29	3.585	0.230	0.034	30575
162.000	SD310-HL	29	3.485	0.227	0.033	29768
147.000	1151-3	29	2.780	0.201	0.026	25265
145.000	SD310-HL	29	2.693	0.197	0.026	24351
139.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	29	2.445	0.186	0.024	24335
128.000	1142-2C	30	2.036	0.165	0.021	32620
110.000	Side Lighting	31	1.459	0.135	0.016	34261
51.000	GPS_A	31	0.303	0.051	0.007	46475

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	17.598	2	0.747	0.142
T2	202.458 - 182.292	15.989	2	0.745	0.141
T3	182.292 - 162.104	12.768	2	0.703	0.127
T4	162.104 - 141.896	9.839	6	0.621	0.095
T5	141.896 - 121.688	7.283	6	0.527	0.071
T6	121.688 - 101.479	5.207	6	0.427	0.055
T7	101.479 - 81.2708	3.512	6	0.343	0.042
T8	81.2708 - 61	2.219	6	0.256	0.033
T9	61 - 40.6667	1.246	6	0.182	0.024
T10	40.6667 - 20.3333	0.569	10	0.108	0.016
T11	20.3333 - 0	0.185	10	0.054	0.008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
213.625	Lightning Rod 5/8" x 6'	2	17.598	0.747	0.142	53682
212.625	Climb Leg Extension	2	17.598	0.747	0.142	53682
208.000	(2) LPA-80080/6CF w/ Mount Pipe	2	16.869	0.747	0.142	53682
199.000	APXVSPP18-C-A20 w/ Mount Pipe	2	15.435	0.742	0.140	54498
189.000	AM-X-CD-14-65-00T-RET w/ Mount Pipe	2	13.827	0.723	0.134	25392
183.000	APXV18-206517LS w/ Mount Pipe	2	12.878	0.706	0.128	14207
179.000	HPD2-23	2	12.261	0.692	0.123	13246
175.000	(4) DB844H90E-XY w/ Mount Pipe	6	11.665	0.677	0.116	13387
167.000	1151-3	6	10.517	0.643	0.103	12761
164.000	1151-3	6	10.099	0.630	0.098	12511
162.000	SD310-HL	6	9.825	0.621	0.095	12267
147.000	1151-3	6	7.885	0.551	0.076	9596
145.000	SD310-HL	6	7.646	0.542	0.074	9261
139.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6	6.957	0.513	0.069	9285
128.000	1142-2C	6	5.810	0.457	0.060	12218
110.000	Side Lighting	6	4.179	0.377	0.047	12388
51.000	GPS_A	6	0.874	0.144	0.020	16427

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	212.625	Leg	A325N	0.750	4	0.000	19.439	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	1.331	6.443	0.207 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	1.443	6.443	0.224 ✔	1.333	Bolt Shear
T2	202.458	Leg	A325N	0.875	4	5.881	26.451	0.222 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	3.699	6.443	0.574 ✔	1.333	Bolt 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
		Horizontal	A325N	0.625	2	3.021	6.443	0.469 ✔	1.333	Bolt Shear
T3	182.292	Leg	A325N	1.000	4	16.047	34.557	0.464 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	3.677	6.443	0.571 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	3.416	6.443	0.530 ✔	1.333	Bolt Shear
T4	162.104	Leg	A325N	1.000	6	17.571	34.557	0.508 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	3.579	6.443	0.555 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	3.689	6.443	0.573 ✔	1.333	Bolt Shear
T5	141.896	Leg	A325N	1.000	6	22.184	34.557	0.642 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	4.578	6.443	0.711 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	4.076	6.443	0.633 ✔	1.333	Bolt Shear
T6	121.688	Leg	A325N	1.000	6	27.133	34.557	0.785 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	4.116	6.443	0.639 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	4.015	6.443	0.623 ✔	1.333	Bolt Shear
T7	101.479	Leg	A325N	1.000	8	23.557	34.557	0.682 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	4.076	6.443	0.633 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	4.314	6.443	0.670 ✔	1.333	Bolt Shear
T8	81.2708	Leg	A325N	1.000	8	26.466	34.557	0.766 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	3.980	6.443	0.618 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	4.487	6.443	0.697 ✔	1.333	Bolt Shear
T9	61	Leg	A325N	1.000	8	29.249	34.557	0.846 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	3	4.319	6.443	0.670 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.625	2	5.091	6.443	0.790 ✔	1.333	Bolt Shear
T10	40.6667	Leg	A325N	1.000	8	30.289	34.556	0.877 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.750	3	6.094	9.278	0.657 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.750	2	5.012	9.278	0.540 ✔	1.333	Bolt Shear
T11	20.3333	Leg	A354-BC	1.000	10	28.898	32.398	0.892 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.750	3	7.100	9.278	0.765 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.750	2	6.195	9.278	0.668 ✔	1.333	Bolt Shear

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	212.625 - 202.458	ROHN 2.5 STD	10.167	5.083	64.4 K=1.00	21.955	1.704	-3.283	37.412	0.088* ✔

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	202.458 - 182.292	ROHN 3 EH	20.167	6.722	71.0 K=1.00	20.754	3.016	-31.589	62.592	0.505 ✔
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8 K=1.00	23.588	4.407	-77.276	103.964	0.743 ✔
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.6 K=1.00	25.174	6.038	-127.355	151.996	0.838 ✔
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6 K=1.00	23.618	6.713	-158.247	158.554	0.998 ✔
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4 K=1.00	23.490	8.405	-192.286	197.432	0.974 ✔
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4 K=1.00	23.490	8.405	-222.678	197.432	1.128 ✔
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8 K=1.00	25.581	9.719	-251.140	248.629	1.010 ✔
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9 K=1.00	25.564	9.719	-278.843	248.467	1.122 ✔
T10	40.6667 - 20.3333	ROHN 8 EH	20.391	10.196	42.5 K=1.00	25.475	12.763	-290.925	325.129	0.895 ✔
T11	20.3333 - 0	ROHN 8 EH	20.373	10.145	42.3 K=1.00	25.505	12.763	-347.984	325.518	1.069 ✔

* DL controls

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	212.625 - 202.458	ROHN 2 STD	6.639	6.453	98.4 K=1.00	15.079	1.075	-3.994	16.203	0.246 ✔
T2	202.458 - 182.292	ROHN 2 STD	7.987	7.717	117.6 K=1.00	10.790	1.075	-11.098	11.595	0.957 ✔
T3	182.292 - 162.104	ROHN 2 STD	8.602	8.301	126.5 K=1.00	9.325	1.075	-10.876	10.020	1.085 ✔
T4	162.104 - 141.896	ROHN 2 STD	9.291	8.958	136.6 K=1.00	8.006	1.075	-10.494	8.603	1.220 ✔
T5	141.896 - 121.688	ROHN 2.5 STD	12.600	12.138	153.7 K=1.00	6.318	1.704	-13.556	10.766	1.259 ✔
T6	121.688 - 101.479	ROHN 2.5 STD	13.385	12.964	164.2 K=1.00	5.539	1.704	-12.145	9.438	1.287 ✔
T7	101.479 - 81.2708	ROHN 3 STD	14.235	13.843	142.8 K=1.00	7.327	2.228	-12.160	16.327	0.745 ✔
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9 K=1.00	6.470	2.228	-11.941	14.419	0.828 ✔
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2 K=1.00	5.679	2.228	-12.958	12.656	1.024 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1 K=1.00	9.242	2.228	-18.281	20.595	0.888 ✔
T11	20.3333 - 0	ROHN 3 STD	25.218	12.609	130.0 K=1.00	8.831	2.228	-21.301	19.680	1.082 ✔

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 $\frac{P}{P_a}$

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 $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.521	4.141	79.8 K=1.00	19.051	0.799	-2.885	15.230	0.189 ✔
T2	202.458 - 182.292	ROHN 1.5 STD	8.597	4.153	80.0 K=1.00	19.004	0.799	-6.041	15.193	0.398 ✔
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9 K=1.00	16.310	0.799	-6.833	13.039	0.524 ✔
T4	162.104 - 141.896	ROHN 2 STD	12.097	5.819	88.7 K=1.00	17.212	1.075	-7.374	18.495	0.399 ✔
T5	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9 K=1.00	14.269	1.075	-8.147	15.333	0.531 ✔
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0 K=1.00	10.374	1.075	-8.027	11.147	0.720 ✔
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5 K=1.00	11.192	1.704	-8.625	19.071	0.452 ✔
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7 K=1.00	8.739	1.704	-8.973	14.893	0.602 ✔
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0 K=1.00	6.913	1.704	-10.180	11.780	0.864 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1 K=1.00	9.388	2.228	-10.022	20.922	0.479 ✔
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8 K=1.00	7.639	2.228	-12.387	17.023	0.728 ✔

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	212.625 - 202.458	ROHN 1.5 STD	8.500	4.130	79.6 K=1.00	19.091	0.799	-0.263	15.262	0.017 ✔

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	5.935	114.4 K=1.00	11.073	0.799	-5.053	8.852	0.571 ✔

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 $\frac{P}{P_a}$
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2 K=1.00	9.231	0.799	-6.036	7.380	0.818 ✔

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.628	10.887	166.0 K=1.00	5.420	1.075	-4.667	5.824	0.801 ✔
T11	20.3333 - 0	ROHN 2 STD	11.987	11.315	172.5 K=1.00	5.018	1.075	-5.199	5.392	0.964 ✔

Redundant Hip (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	6.294	121.3 K=1.00	10.093	0.799	-0.026	8.069	0.003 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.958	134.1 K=1.00	8.302	0.799	-0.024	6.637	0.004 ✔

Redundant Hip 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.204	15.204	192.6 K=1.00	4.027	1.704	-0.052	6.862	0.008* ✔
T11	20.3333 - 0	ROHN 2.5 STD	15.995	15.995	202.6 K=1.00	3.639	1.704	-0.051	6.200	0.008* ✔

* DL controls

Inner Bracing 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	212.625 - 202.458	L2x2x1/8	4.250	4.250	128.3 K=1.00	9.074	0.484	-0.005	4.395	0.001

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	202.458 - 182.292	L2x2x1/8	4.299	4.299	129.8 K=1.00	8.870	0.484	-0.007	4.296	0.002 ✔
T3	182.292 - 162.104	L2x2x1/8	4.660	4.660	140.7 K=1.00	7.548	0.484	-0.007	3.656	0.002 ✔
T4	162.104 - 141.896	L2x2x1/8	6.049	6.049	182.6 K=1.00	4.480	0.484	-0.007	2.170	0.003 ✔
T5	141.896 - 121.688	L2x2x1/8	6.958	6.958	210.0 K=1.00	3.385	0.484	-0.007	1.640	0.004 ✔
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	8.146	8.146	197.5 K=1.00	3.829	0.902	-0.006	3.454	0.002* ✔
T7	101.479 - 81.2708	L3x3x3/16	9.396	9.396	189.2 K=1.00	4.173	1.090	-0.008	4.548	0.002* ✔
T8	81.2708 - 61	L3 1/2x3 1/2x1/4	10.680	10.680	184.7 K=1.00	4.379	1.690	-0.010	7.401	0.001* ✔
T9	61 - 40.6667	L3 1/2x3 1/2x1/4	11.964	11.964	206.9 K=1.00	3.490	1.690	-0.010	5.898	0.002* ✔
T10	40.6667 - 20.3333	ROHN 3 STD	12.589	12.589	129.8 K=1.00	8.860	2.228	-0.012	19.744	0.001* ✔
T11	20.3333 - 0	ROHN 3 STD	13.917	13.917	143.5 K=1.00	7.250	2.228	-0.010	16.155	0.001* ✔

* DL controls

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	212.625 - 202.458	ROHN 2.5 STD	10.167	5.083	64.4	30.000	1.704	0.051	51.121	0.001 ✔
T2	202.458 - 182.292	ROHN 3 EH	20.167	6.722	71.0	30.000	3.016	23.524	90.478	0.260 ✔
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8	30.000	4.407	64.189	132.223	0.485 ✔
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.6	30.000	6.038	105.424	181.132	0.582 ✔
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6	30.000	6.713	133.106	201.398	0.661 ✔
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4	30.000	8.405	162.795	252.148	0.646 ✔
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4	30.000	8.405	188.454	252.148	0.747 ✔
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8	30.000	9.719	211.728	291.579	0.726 ✔
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9	30.000	9.719	233.992	291.579	0.802

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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 8 EH	20.391	10.196	42.5	30.000	12.763	243.034	382.882	0.635 ✔
T11	20.3333 - 0	ROHN 8 EH	20.373	0.083	0.3	30.000	12.763	288.985	382.882	0.755 ✔

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	212.625 - 202.458	ROHN 2 STD	6.639	6.453	98.4	30.000	1.075	3.930	32.236	0.122 ✔
T2	202.458 - 182.292	ROHN 2 STD	7.987	7.717	117.6	30.000	1.075	11.033	32.236	0.342 ✔
T3	182.292 - 162.104	ROHN 2 STD	8.390	8.089	123.3	30.000	1.075	10.959	32.236	0.340 ✔
T4	162.104 - 141.896	ROHN 2 STD	8.827	8.495	129.5	30.000	1.075	10.643	32.236	0.330 ✔
T5	141.896 - 121.688	ROHN 2.5 STD	12.273	11.811	149.6	30.000	1.704	13.591	51.121	0.266 ✔
T6	121.688 - 101.479	ROHN 2.5 STD	12.984	12.563	159.1	30.000	1.704	12.168	51.121	0.238 ✔
T7	101.479 - 81.2708	ROHN 3 STD	13.802	13.410	138.3	30.000	2.228	11.939	66.854	0.179 ✔
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9	30.000	2.228	11.539	66.854	0.173 ✔
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2	30.000	2.228	12.491	66.854	0.187 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1	30.000	2.228	17.334	66.854	0.259 ✔
T11	20.3333 - 0	ROHN 3 STD	25.218	12.609	130.0	30.000	2.228	20.378	66.854	0.305 ✔

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 $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.521	4.141	79.8	30.000	0.799	2.880	23.984	0.120 ✔
T2	202.458 - 182.292	ROHN 1.5 STD	8.597	4.153	80.0	30.000	0.799	6.042	23.984	0.252 ✔
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9	30.000	0.799	6.827	23.984	0.285 ✔
T4	162.104 - 141.896	ROHN 2 STD	12.097	5.819	88.7	30.000	1.075	7.379	32.236	0.229 ✔

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	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9	30.000	1.075	8.151	32.236	0.253 ✔
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0	30.000	1.075	8.030	32.236	0.249 ✔
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5	30.000	1.704	8.628	51.121	0.169 ✔
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7	30.000	1.704	8.975	51.121	0.176 ✔
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0	30.000	1.704	10.182	51.121	0.199 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1	30.000	2.228	10.024	66.854	0.150 ✔
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8	30.000	2.228	12.389	66.854	0.185 ✔

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	212.625 - 202.458	ROHN 1.5 STD	8.500	4.130	79.6	30.000	0.799	0.262	23.984	0.011 ✔

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	5.935	114.4	21.600	0.799	5.053	17.268	0.293 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2	21.600	0.799	6.036	17.268	0.350 ✔

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.628	10.887	166.0	21.600	1.075	4.667	23.210	0.201 ✔
T11	20.3333 - 0	ROHN 2 STD	11.987	11.315	172.5	21.600	1.075	5.199	23.210	0.224 ✔

Redundant Hip (1) 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	6.294	121.3	21.600	0.799	0.014	17.268	0.001 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.958	134.1	21.600	0.799	0.014	17.268	0.001 ✔

Redundant Hip 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 $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.204	15.204	192.6	21.600	1.704	0.044	36.807	0.001* ✔
T11	20.3333 - 0	ROHN 2.5 STD	15.995	15.995	202.6	21.600	1.704	0.044	36.807	0.001* ✔

* DL controls

Inner Bracing 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	212.625 - 202.458	L2x2x1/8	4.250	4.250	81.4	21.600	0.484	0.005	10.463	0.000 ✔
T2	202.458 - 182.292	L2x2x1/8	4.299	4.299	82.4	21.600	0.484	0.007	10.463	0.001 ✔
T3	182.292 - 162.104	L2x2x1/8	4.313	4.313	82.6	21.600	0.484	0.005	10.463	0.000 ✔
T4	162.104 - 141.896	L2x2x1/8	5.354	5.354	102.6	21.600	0.484	0.006	10.463	0.001 ✔
T5	141.896 - 121.688	L2x2x1/8	6.396	6.396	122.6	21.600	0.484	0.003	10.463	0.000 ✔
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	7.521	7.521	116.0	21.600	0.902	0.001	19.483	0.000 ✔

Section Capacity Table

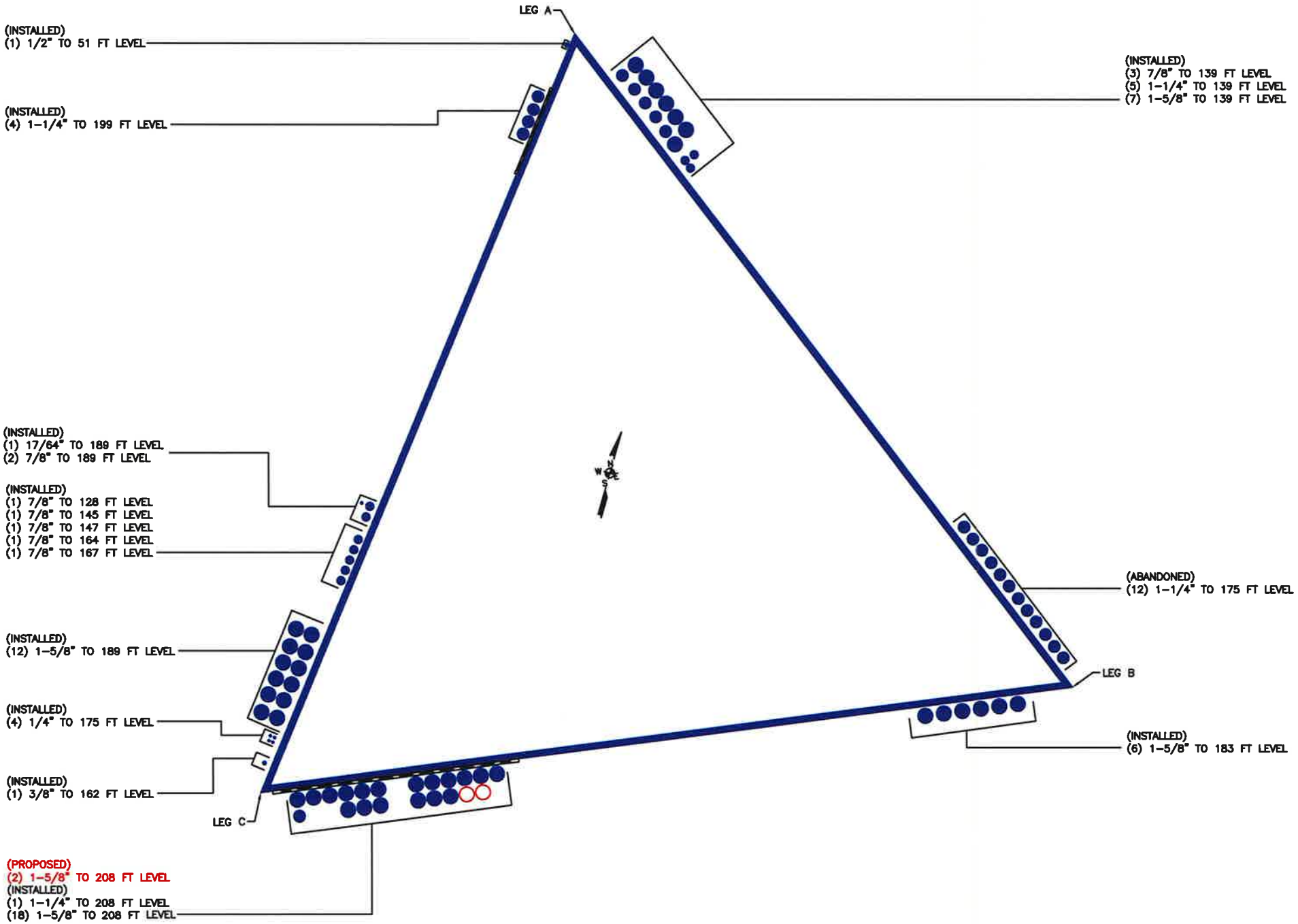
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	212.625 - 202.458	Leg	ROHN 2.5 STD	1	-2.853	37.412	12.5	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-31.589	83.436	37.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T3	182.292 - 162.104	Leg	ROHN 4 EH	67	-77.276	138.584	55.8	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	108	-127.355	202.611	62.9	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-158.247	211.352	74.9	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-192.286	263.177	73.1	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-222.678	263.177	84.6	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-251.140	331.422	75.8	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-278.843	331.206	84.2	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-290.925	433.397	67.1	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-347.984	433.915	80.2	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	14	-3.994	21.598	18.5	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	39	-11.098	15.455	71.8	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	72	-10.876	13.357	81.4	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-10.494	11.468	91.5	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-13.556	14.351	94.5	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	176	-12.145	12.581	96.5	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	203	-12.160	21.764	55.9	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	230	-11.941	19.220	62.1	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	257	-12.958	16.870	76.8	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	284	-18.281	27.453	66.6	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	317	-21.301	26.233	81.2	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	13	-2.885	20.302	14.2 16.8 (b)	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-6.041	20.252	29.8 35.2 (b)	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	70	-6.833	17.381	39.3 39.8 (b)	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-7.374	24.654	29.9 43.0 (b)	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	148	-8.147	20.439	39.9 47.5 (b)	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	175	-8.027	14.859	54.0	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	202	-8.625	25.422	33.9 50.2 (b)	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	229	-8.973	19.852	45.2 52.3 (b)	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	256	-10.180	15.702	64.8	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	283	-10.022	27.888	35.9 40.5 (b)	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	316	-12.387	22.692	54.6	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	5	-0.263	20.345	1.3	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	288	-5.053	11.800	42.8	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-6.036	9.837	61.4	Pass
T10	40.6667 -	Redund Diag 1	ROHN 2 STD	293	-4.667	7.764	60.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
	20.3333	Bracing						
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	326	-5.199	7.188	72.3	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	308	-0.026	10.756	0.2	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	341	-0.024	8.848	0.3	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal Bracing	ROHN 2.5 STD	309	-0.052	6.862	0.8	Pass
T11	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	340	-0.051	6.200	0.8	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	16	-0.004	5.830	0.3	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	42	-0.007	5.727	0.3	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	79	-0.006	4.221	0.3	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	118	-0.007	2.892	0.4	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	157	-0.007	2.186	0.4	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	184	-0.006	3.454	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	211	-0.008	4.548	0.5	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.010	7.401	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	265	-0.010	5.898	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.012	19.744	0.4	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.010	16.155	0.4	Pass
							Summary	
						Leg (T7)	84.6	Pass
						Diagonal (T6)	96.5	Pass
						Horizontal (T9)	64.8	Pass
						Top Girt (T1)	1.3	Pass
						Redund Horz 1 Bracing (T11)	61.4	Pass
						Redund Diag 1 Bracing (T11)	72.3	Pass
						Redund Hip 1 Bracing (T11)	0.3	Pass
						Redund Hip Diagonal Bracing (T11)	0.8	Pass
						Inner Bracing (T7)	0.5	Pass
						Bolt Checks	66.9	Pass
						RATING =	**96.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


LEG A
(INSTALLED)
(1) 1/2" TO 51 FT LEVEL
(INSTALLED)
(4) 1-1/4" TO 199 FT LEVEL
(INSTALLED)
(3) 7/8" TO 139 FT LEVEL
(5) 1-1/4" TO 139 FT LEVEL
(7) 1-5/8" TO 139 FT LEVEL
(INSTALLED)
(1) 17/64" TO 189 FT LEVEL
(2) 7/8" TO 189 FT LEVEL
(INSTALLED)
(1) 7/8" TO 128 FT LEVEL
(1) 7/8" TO 145 FT LEVEL
(1) 7/8" TO 147 FT LEVEL
(1) 7/8" TO 164 FT LEVEL
(1) 7/8" TO 167 FT LEVEL
(ABANDONED)
(12) 1-1/4" TO 175 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 189 FT LEVEL
LEG B
(INSTALLED)
(4) 1/4" TO 175 FT LEVEL
(INSTALLED)
(1) 3/8" TO 162 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 183 FT LEVEL
LEG C
(PROPOSED)
(2) 1-5/8" TO 208 FT LEVEL
(INSTALLED)
(1) 1-1/4" TO 208 FT LEVEL
(18) 1-5/8" TO 208 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

PROJECT	**806363 - HRT 105 943201, CT**				SS
SUBJECT	**Pad Footing Analysis**				
DATE	**08/05/15**	PAGE	**1**	OF	**9**

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

100083_001_01_SS Unit Base Unified (1 5)_Square_Rev F-G.xls

B&T Proj. No.: 0

Combined Footing Foundation Analysis

Rev. Type: F

Design Loads:

Input unfactored loads

Compression per leg (P_C)	=	346.0	(k)
Tension per leg (P_T)	=	287.0	(k)
Overturning Moment (M_O)	=	8,281.0	(k)
Total Tower Horizontal Load	=	65.0	(k-ft)
Tower + Appurtenances	=	84.0	(k)

Saftey Factors

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

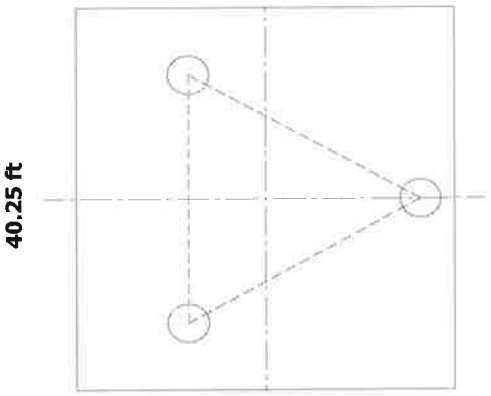
Tower Information

Tower base width	=	30.00	ft

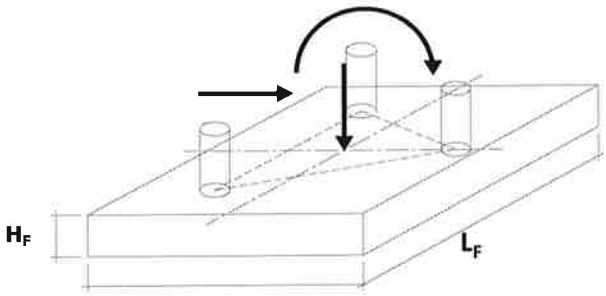
Pad & Pier Dimensions / Properties:

Tower Shape (triangle or square)	=	T	
Base Plate Width (di)	=	12.00	(in)
Pier height above grade (D_A)	=	0.50	(ft)
Footing Width (W_F)	=	40.25	(ft)
Footing Thickness (H_F)	=	4.50	(ft)
Depth to BOC (D)	=	4.00	(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)	=	55	
Size of footing Rebar	=	# 7	(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)	=	35	(degrees)
Cohesion (C)	=	0.00	(ft)
Top Soil to Neglect (N)	=	4.00	(ft)
Base Sliding (μ)	=	0.20	(ksf)
Dry Soil Density (γ_{DRY})	=	105	(pcf)

Summary of Results

Overturing	68.59%
Soil Bearing	27.96%
Base Sliding	28.81%
One way Shear	3.87%
Punching Shear	28.43%
Pad Moment Capacity	33.58%