Robinson+Cole

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Also admitted in Massachusetts

November 9, 2017

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
197 South Street, Vernon, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 117-foot level top of an existing 132-foot self-supporting lattice tower at 197 South Street in Vernon, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 1987 (Docket No. 58). Cellco now intends to replace three (3) of its existing antennas with three (3) model QUAD656C0000x, 850 MHz antennas, at the same level on the tower. Cellco also intends to replace nine (9) remote radio heads ("RRHs") with nine (9) newer model RRHs and install three (3) new RRHs, for a total of twelve (12) RRHs and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Daniel A. Champagne, Mayor for the Town of Vernon; Marina Rodriguez, Vernon's Town Planner; Connecticut Water Company, the owner of the Property; and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed at the 117-foot level of the 132-foot tower.

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

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for the modified facility is included behind 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).

A copy of the parcel map and owner information for the Property is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5.

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

Sincerely,

Kenneth C. Baldwin

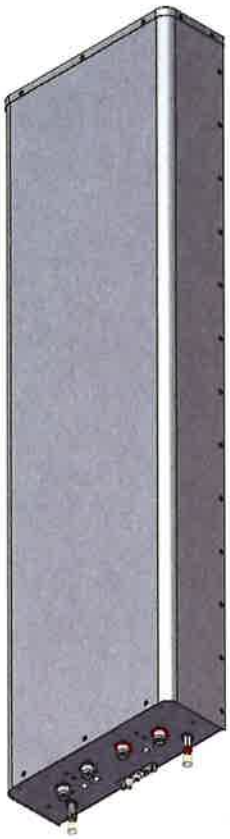
Enclosures
Copy to:
Daniel A. Champagne, Vernon Mayor
Marina Rodriguez, Vernon Town Planner
Connecticut Water Company
Crown Castle
Tim Parks

ATTACHMENT 1

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

- Twin band, quad-port panel antenna with variable electrical tilt
- 4x4 MIMO
- Patented internal RET actuator adds no additional length to the antenna



Ordering Options	Model Number
When ordering, replace "x" in the model number with one of the options listed below.	
Manual Electrical Tilt	QUAD656C0000M
Remote Electrical Tilt AISG v2.0 / 3GPP with an MDCU RET Actuator	QUAD656C0000G
Remote Electrical Tilt AISG v2.0 / 3GPP with an MDDU RET Actuator	QUAD656C0000L
Mounting bracket kits and other accessories are ordered separately.	

Electrical Characteristics		(2x) 696-900 MHz	
Frequency Bands		696-806 MHz	806-900 MHz
Polarization		(2x) ±45° (Quad-Pol)	
Horizontal Beamwidth		67°	66°
Vertical Beamwidth		13.6°	12.4°
Gain		14.5 dBi	15.0 dBi
Electrical Downtilt		0-12°	
Impedance		50Ω	
VSWR		≤ 1.5:1	
Upper Sidelobe Suppression		18 dB	18 dB
Front-to-Back Ratio		> 25 dB	> 25 dB
Inband Isolation		25 dB	
Isolation Between Bands		28 dB	
IM3 (2x20W carrier)		< -153 dBc	
Input Power		(4x) 500 W	
Total Number of Connectors		Antennas has 4 connectors located at the bottom	
Connectors Per Band	696-900 MHz	(2x) 7/16-DIN Female	
	696-900 MHz	(2x) 7/16-DIN Female	
Diplexed		No	
Lightning Protection		Direct Ground	
Operating Temperature		-40° to +60° C (-40° to +140° F)	

Mechanical Characteristics			
Dimensions (Length x Width x Depth)		1889 x 520 x 182 mm	74.4 x 20.5 x 7.2 in
Depth with Z-Brackets		227 mm	8.9 in
Weight without Mounting Brackets: MET		24.5 kg	54.0 lbs
Weight without Mounting Brackets: RET		24.8 kg	54.7 lbs
Survival Wind Speed		> 241 km/hr	> 150 mph
Wind Area	Front	0.98 m^2	10.6 ft^2
	Side	0.34 m^2	3.7 ft^2
Wind Loads (160 km/hr or 100 mph)	Front	1200 N	270 lbf
	Side	415 N	93 lbf

Quoted performance parameters are provided to offer typical, peak or range values only and may vary as a result of normal testing, manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to products may be made without notice.

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

Electrical Downtilt Control		
Electrical downtilt for each band can be controlled separately. Tilt indicator(s) are covered by removable transparent cap(s).		
Manual Electrical Tilt (MET) Control	A colored knob at the end of the tilt indicator allows change of the tilt without need of a tool. The knob color is identical to the corresponding connector ring color. To access the knob, remove the cap by turning it counter-clockwise. It is re-installed by opposite rotation. Do not remove the transparent cap(s) from the antenna.	
Remote Electrical Tilt (RET) Control	The remote control of the electrical tilt is managed by either a Multi-Device Control Unit (MDCU) or a Multi-Device Dual Unit (MDDU) inserted in the bottom of the antenna. A single actuator individually controls the tilt of each band (no need for daisy chain cables between the bands). This module does not add any additional length to the antenna. For RET control, the transparent caps must be in place and locked. The tilt angle indicators always remain visible and the antenna still has manual tilt control (manual override).	
RET Actuator	Select one of the following RET actuators when ordering this antenna.	
	Multi-Device Control Unit (MCDU)	The MDCU is an electronic module that allows the remote control of the electrical downtilt (RET) in Amphenol antennas with factory embedded motors. The MDCU is factory installed. Refer to ordering options.
	Multi-Device Dual Unit (MDDU)	The MDDU allows two separate RET Controllers to independently drive the RETs in Amphenol antennas with factory installed motors (for antenna sharing). The MDDU is factory installed. Refer to ordering options.
Important Installation Instructions	In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.	
	Do not install the antenna with the connectors facing upward.	

Mounting Options	Part Number	Image	Fits Pipe Diameter	Weight
All mounting bracket kits are ordered separately unless otherwise indicated. Select from the options listed below.				
3-Point Mounting and Downtilt Bracket Kit	36210008		40-115 mm 1.6-4.5 in	6.9 kg 15.2 lbs

Configuration Options
This antenna model **cannot** be used with Amphenol's UNICELL 3-sector antenna enclosures.

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

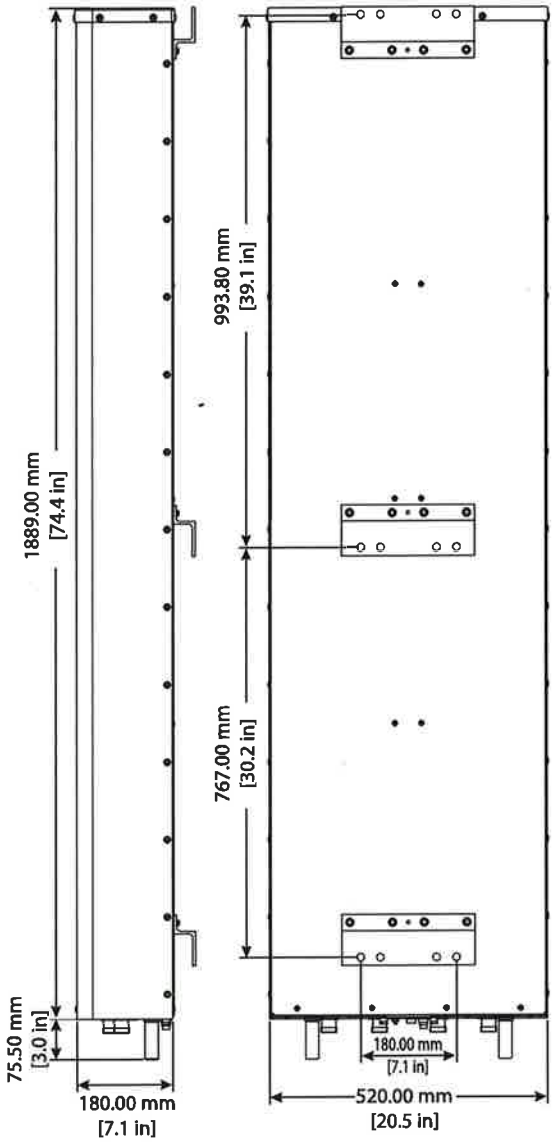
Bottom View of Antenna

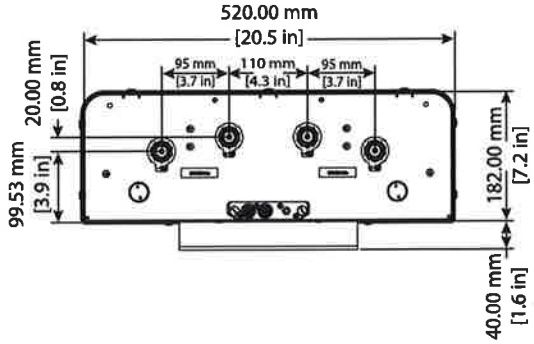
Location of the MDCU or MDDU for RET Control *(MDCU shown)*

Tilt indicators covered by transparent caps.
Manual adjustment is accessed by removing the caps.
Knob colors are the same as the connectors.

In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.

Dimensions

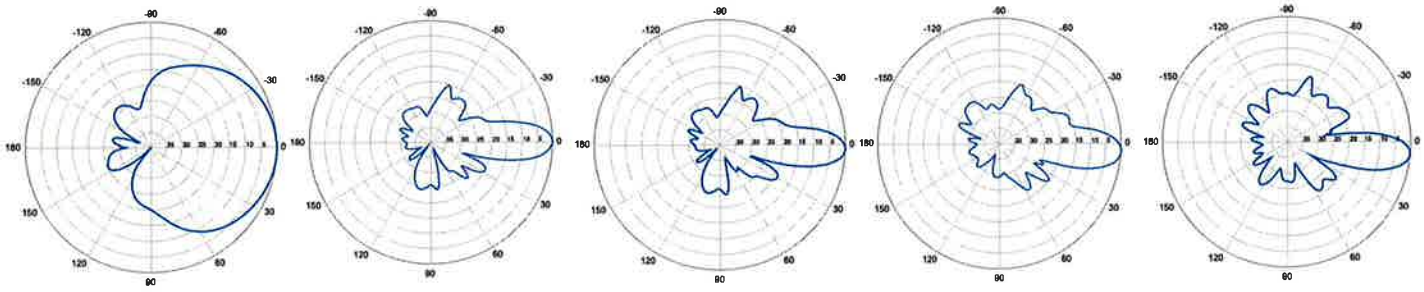




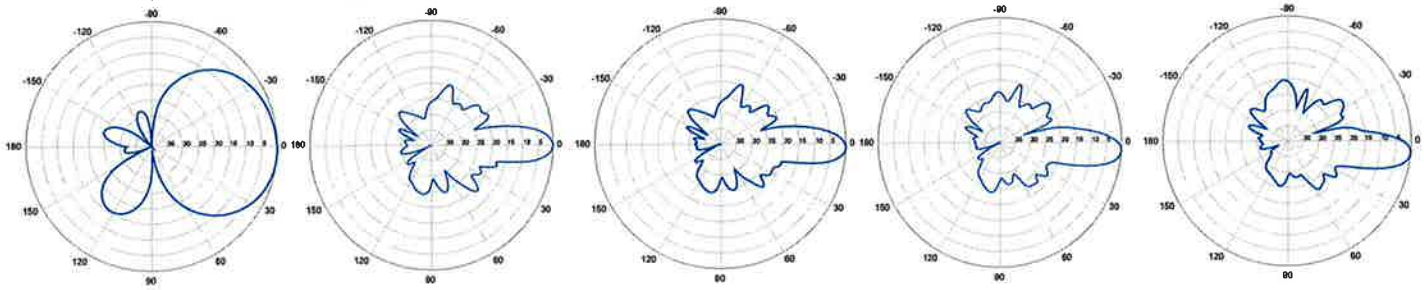
QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

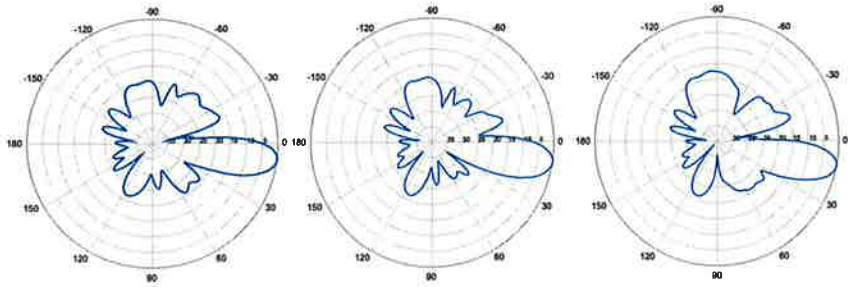
696-900 MHz



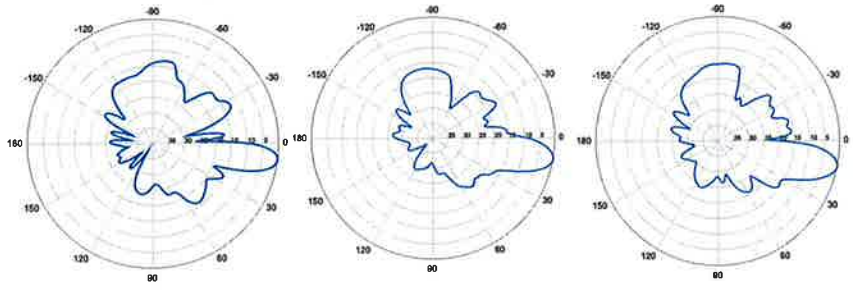
Horizontal | 750 MHz | 0° | Vertical | 750 MHz | 2° | Vertical | 750 MHz | 4° | Vertical | 750 MHz | 6° | Vertical | 750 MHz



Horizontal | 850 MHz | 0° | Vertical | 850 MHz | 2° | Vertical | 850 MHz | 4° | Vertical | 850 MHz | 6° | Vertical | 850 MHz



8° | Vertical | 750 MHz | 10° | Vertical | 750 MHz | 12° | Vertical | 750 MHz



8° | Vertical | 850 MHz | 10° | Vertical | 850 MHz | 12° | Vertical | 850 MHz

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

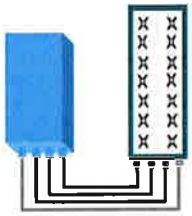
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

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

ALCATEL-LUCENT B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new 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 B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 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, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

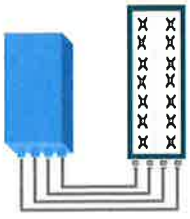
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) **RX Diversity scheme**	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) **Volume (w/ solar shield) in L** **Weight (w/ solar shield) in kg (lb)**	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range **DC power consumption**	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
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 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 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

ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 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. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

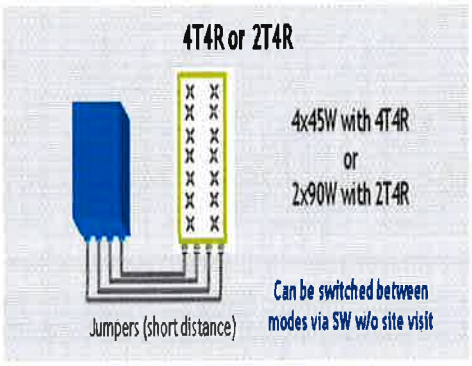
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

The Alcatel-Lucent B66a RRH4x45 is a compact (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 B66a RRH4x45 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 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz 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 AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.) Volume in Liters Weight in kg (lb) (w/o mounting HW)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield) 25.8kg (56.8lb) (with solar shield)
DC voltage range DC power consumption	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure 250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

NOKIA

AirScale RRH 4T4R B5 160W AHCA

Capacity, performance, low total cost of ownership and investment protection

Nokia AirScale Remote Radio Head (RRH) AHCA supports band 5 - full band - along with 4×4 MIMO and 256QAM modulation to deliver higher data rates. It offers Nokia's unique book mounting for faster roll out and radio-integrated Passive Intermodulation (PIM) cancellation for enhanced network performance.

Furthermore, 4TX and 4RX paths in a single radio unit gives the flexibility to support 2T2R-2 sectors or 4T4R-single sector from a single unit, for cost-effective scaling of both coverage and capacity.

Capacity and performance

AirScale RRH 4T4R delivers 160 W (4×40 W) transmit power and can support 2×2 MIMO, 4×2 MIMO and 4×4 MIMO. The radio supports 256 QAM modulation in the downlink (DL) for up to 30 percent higher throughput. The Virtual Spectrum Analyzer feature enables both uplink and downlink spectrum to be analyzed.

Low total cost of ownership

With up to two sectors in a single radio, light weight and zero-bolt book mounting, AirScale RRH 4T4R allows operators to achieve faster roll outs and more cost-effective installation and maintenance of radios and tower space.

Investment protection

AirScale RRH 4T4R complements the AirScale System Module, offering a complete base station solution that is software upgradeable to 5G. AirScale System

Module offers 28 Gbps capacity that can be further enhanced by chaining more modules or through Cloud RAN. AirScale RRH is part of the AirScale Base Station portfolio, the next generation Nokia base station platform, and is backwards-compatible with the Nokia Flexi Multiradio 10 Base Station to best use an operator's existing investments.

NOKIA

Product name	AirScale RRH 4T4R B5 160W AHCA - 473966A
Supported frequency bands	3GPP band 5
Frequencies	DL 869-894MHz, UL 824-849MHz
Number of TX/RX ports	4/4
Instantaneous Bandwidth IBW	25MHz
Occupied Bandwidth OBW	25MHz
Output power	4T4R 40 W/ 2T4R 60W
Dimensions (mm) height x width x depth	337 x 295 x 165
Volume (liters)	16.4
Weight (kg)	16
Supply Voltage / Voltage Range	DC-48V / -36V to -60V
Typical Power Consumption	207 W (ETSI 24h Avg – 4x20W mode)
Antenna ports	4TX/4RX, 4.3-10+
Optical ports	2 x CPRI 9.8 Gbps
ALD control interfaces	AISG3.0 from ANT1, 2, 3, 4 and RET (Power supply ANT1 and ANT3)
Other interfaces	External alarm MDR-26 serial connector (4 inputs, 1 output) DC circular power connector
Operational temperature range	-40°C to 55°C (with no solar load)
Ingress protection class	IP65
Installation options	Pole or wall, RAS, vertical or horizontal book mount
Surge protection	Class II 5kA

Nokia Oyj
Karaportti 3
FI-02610 Espoo
Finland
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Product code: SR1611002341EN (April)

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

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

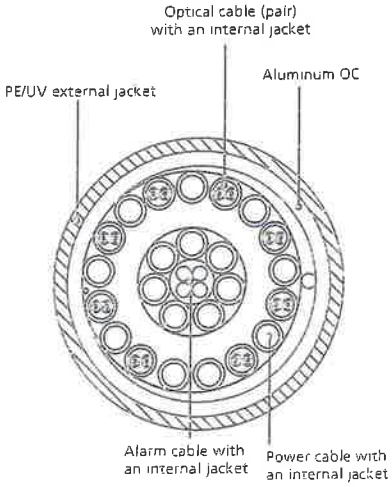


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Vernon								
Tower Height: 132ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T-UMTS	2	419	106	850	0.0301	0.5667	0.53%	
*AT&T-PCS-UMTS	2	817	106	1900	0.0587	1.0000	0.59%	
*AT&T-GSM	2	762	106	850	0.0548	0.5667	0.97%	
*AT&T-WCS-LTE	2	2154	106	2300	0.1549	1.0000	1.55%	
*AT&T-LTE	2	1184	106	700	0.0852	0.4667	1.82%	
*AT&T-PCS-LTE	2	1423	106	1900	0.1023	1.0000	1.02%	
*XM Sat Radio	2	312	132	2337.49	0.0141	1.0000	0.14%	
*Town	1	63	98	954.1	0.0027	0.6361	0.04%	
*Town	1	200	85	460.325	0.0115	0.3069	0.38%	
*Town	1	75	135	453.8125	0.0016	0.3025	0.05%	
*Town	1	228	50	4900	0.0424	1.0000	0.42%	
*Pocket (now MetroPCS)	3	631	84	2130	0.1119	1.0000	1.12%	
*Sprint	3	693	130	1900	0.0486	1.0000	0.49%	
*Sprint	1	390	130	850	0.0091	0.5667	0.16%	
*Sprint	2	693	130	2500	0.0324	1.0000	0.32%	
*Clearwire	2	153	137	2496	0.0064	1.0000	0.06%	
*Clearwire	1	211	137	18 GHz	0.0044	1.0000	0.04%	
*T-Mobile	1	865	84	700	0.0511	0.4667	1.10%	
*T-Mobile	4	1167	84	1950	0.2759	1.0000	2.76%	
*T-Mobile	2	2334	84	2100	0.2759	1.0000	2.76%	
*T-Mobile	2	849	84	2100	0.1004	1.0000	1.00%	
Verizon PCS	**1**	**5301**	**117**	**0.1392**	**1970**	**1.0000**	**13.92%**	
Verizon Cellular	**9**	**526**	**117**	**0.1243**	**869**	**0.5793**	**21.47%**	
Verizon 850 LTE	**1**	**2879**	**117**	**0.0756**	**869**	**0.5793**	**13.05%**	
Verizon AWS	**1**	**7951**	**117**	**0.2088**	**2145**	**1.0000**	**20.88%**	
Verizon 700	**1**	**2261**	**117**	**0.0594**	**746**	**0.4973**	**11.94%**	
								98.61%
* Source: Siting Council								

ATTACHMENT 3

Date: **June 13, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	119705
	Carrier Site Name:	Vernon CT
Crown Castle Designation:	**Crown Castle BU Number:**	806377
	Crown Castle Site Name:	HRT 084 943242
	Crown Castle JDE Job Number:	442678
	Crown Castle Work Order Number:	1416343
	Crown Castle Application Number:	393823 Rev. 1
Engineering Firm Designation:	**SSOE Group Project Number:**	017-00651-00 BC 1058
Site Data:	**197 South Street, Vernon, CT 06066, Tolland County** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132 Foot – Modified Rohn Self Support Tower**	

Dear Mr. Charles McGuirt,

SSOE Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1045678, in accordance with application 393823, revision 1.

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 I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 124 mph converted to a nominal 3-second gust wind speed of 96 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis

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

Structural analysis prepared by: Nathan LaPorte

Respectfully submitted by:

STATE OF CONNECTICUT
BARRY W. BURGESS
NO. 25165
LICENSED PROFESSIONAL ENGINEER

Barry W. Burgess, PE
Section Manager

06/13/2017

TABLE OF CONTENTS

1) INTRODUCTION

The existing 132' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals.

The tower was originally designed for Motorola, Inc. and Metro Mobile CTS by Rohn in accordance with E.I.A. Zone "A" with 0.5" radial ice.

Modifications designed by L&W Engineering (W.O. #: 2106-2, dated 10/31/95), which consisted of replacing tower diagonals from the 100.0' to 120.0' elevations, have been considered.

Modifications designed by SSOE Group (Project #: 015-00428-01, WO #: 1059741, dated 05/15/15), which consisted of installing secondary horizontals from 0.0' to 10.0' and 80.0' to 86.7' elevations, have been considered.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 96 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B.

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
117.0	117.0	3	Alcatel Lucent	B13 RRH 4X30	1 1	1-5/8 7/8	1
		3	Alcatel Lucent	B25 RRH2x60 PCS			
		3	Alcatel Lucent	B66A RRH4X45			
		3	Amphenol	QUAD656C0000X w/ Mount Pipe			
		3	Nokia	AIRSCALE RRH 4T4R B5 160W			

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

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	141.0	1	Decibel	DB413-B	3 1 2	1-1/4 5/8 7/8	
	130.0	3	Alcatel Lucent	TD-RRH8x20-25			
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		3	Alcatel Lucent	1900MHz RRH (65MHz)			
		1		T- Arm Mount [TA 702-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	118.0	2	RFS Celwave	DB-T1-6Z-8AB-0Z			
	117.0	6	RFS Celwave	FD9R6004/2C-3L	1 1	1-5/8 7/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		3	Alcatel Lucent	RRH2x60-AWS			
		1	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	Andrew	LNX-6514DS-T6M w/ Mount Pipe			
		1	Antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	Andrew	SBNHH-1D65B w/ Mount Pipe	11 1	7/8 1-5/8	
		1	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		2	Andrew	LBX-6515DS-TOM w/ Mount Pipe			
		1		Sector Mount [SM 504-3]			
104.0	106.0	1	CCI Antennas	TPA-65R-LCUUUU-H8-K w/ Mount Pipe			2
		2	Quintel Technology	QS66512-2 w/ Mount Pipe			
		3	Ericsson	RRUS 32 B2			
		2	CCI Antennas	HPA-65R-BUU-H6	2 2 14	3/8 3/4 7/8	
		1	CCI Antennas	HPA-65R-BUU-H8			
		3	Ericsson	RRUS 32			
		6	Kathrein	860 10025			
		2	Raycap	DC6-48-60-18-8F			
		6	Communication Components	DTMABP7819VG12A			
		6	Kathrein	782-10250			
		3	Kathrein	800 10121 w/ Mount Pipe			
		3	Ericsson	RRUS-11			
	104.0	1		Sector Mount [SM 504-3]			
94.0	94.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	
84.0	84.0	3	Andrew	LNX-6515DS-A1M w/ Mount Pipe	1 12	1-5/8 7/8	
		3	Ericsson	RRUS 11 B12			
		3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1		Sector Mount [SM 308-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
76.0	77.0	1	Icom	HG2409U-PRO	1	1-5/8	2
	76.0	1		Side Arm Mount [SO 305-1]			
63.0	63.0	1	Maxrad	MPRC2449	2	3/8	
		1	Redline Communications	RDL-3000			
		1		Side Arm Mount [SO 311-1]			
56.0	59.0	1	Maxrad	GPS-TMG-20N	1	1/2	
	56.0	1		Side Arm Mount [SO 311-1]			
46.0	47.0	1	Lucent	KS24019-L112A	1	1/2	
	46.0	1		Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment to be removed; has not been considered in analysis.
2) Reserved loading.

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)
127.0	127.0	4	Celwave	PD10017	-	-
		4		3' Side Arm Mount		
124.0	124.0	2	Generic	8' Dia. STD Dishes	-	-
112.0	112.0	6	Celwave	PD1132	-	-
		3		6' Side Arm Mount		
80.0	80.0	1	Celwave	PD1109	-	-
		1		6' Side Arm Mount		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Rohn File #: 22731JC, dated 7/24/87	Doc ID#: 529704	Crown DMZ
Foundation Mapping	FDH Engineering Project #: 1310781500, dated 07/18/13	Doc ID#: 1014812	Crown DMZ
Geotechnical Reports	FDH Engineering Project #: 04-1212E, dated 12/30/04	Doc ID#: 1014866	Crown DMZ
Modification Drawings	L&W Engineering Work Order #: 2106-2, dated 10/31/95	Doc ID#: 2240842	Crown DMZ
Modification Inspection	Engineered Tower Solutions, PLLC. Project #: 150657, dated 8/19/15	Doc ID#: 5849707	Crown DMZ

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications, are in good condition, and the tower is twist free and plumb.
2) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
3) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 8/19/15 with any adjustments as noted below.
    a. The base level drawing shows incorrect number of 7/8" coax and 3/8" coax graphically at the 104' loading level. It has been update to reflect the correct number of coax

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.48	36.84	9.4	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.75	36.84	12.9	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-27.20	57.13	47.6	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-35.95	70.89	50.7	Pass
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	69	-45.45	70.89	64.1	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	78	-55.47	91.43	60.7	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-87.17	160.27	54.4	Pass
T8	60 - 40	Leg	ROHN 4 X-STR	110	-117.25	159.91	73.3	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-143.70	201.25	71.4	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-158.06	201.25	78.5	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-170.72	253.28	67.4	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.12	8.62	13.0 19.0 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.03	8.59	12.0 16.4 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	34	-3.86	7.60	50.8 53.5 (b)	Pass
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	61	-4.56	11.42	39.9 53.3 (b)	Pass
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	70	-4.63	10.38	44.6 54.3 (b)	Pass
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-5.75	9.07	63.4 65.4 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-5.81	7.17	80.9	Pass
T8	60 - 40	Diagonal	L3x3x3/16	115	-6.44	9.97	64.5 66.5 (b)	Pass
T9	40 - 20	Diagonal	L3x3x1/4	136	-7.47	8.87	84.1	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-7.56	13.12	57.6 61.3 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	160	-7.97	11.73	68.0	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	86	-0.96	6.82	14.1 20.1 (b)	Pass
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	164	-2.96	10.82	27.4 37.8 (b)	Pass
T1	132 - 124	Top Girt	L2x2x3/16	6	-0.07	4.58	1.5	Pass
T3	120 - 100	Top Girt	L2x2x3/16	32	-0.15	5.79	2.6	Pass
							Summary	
						Leg (T10)	78.5	Pass
						Diagonal (T9)	84.1	Pass
						Secondary Horizontal (T11)	37.8	Pass
						Top Girt (T3)	2.6	Pass
						Bolt Checks	68.1	Pass
						Rating =	**84.1**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Foundation (Structural)		20.4%	Pass
1	Foundation (Soil Interaction)		67.25%	Pass
1	Anchor Rods		78.5%	Pass

Structure Rating (max from all components) =	84.1%

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

4.1) Recommendations

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

5) DISCLAIMER OF WARRANTIES

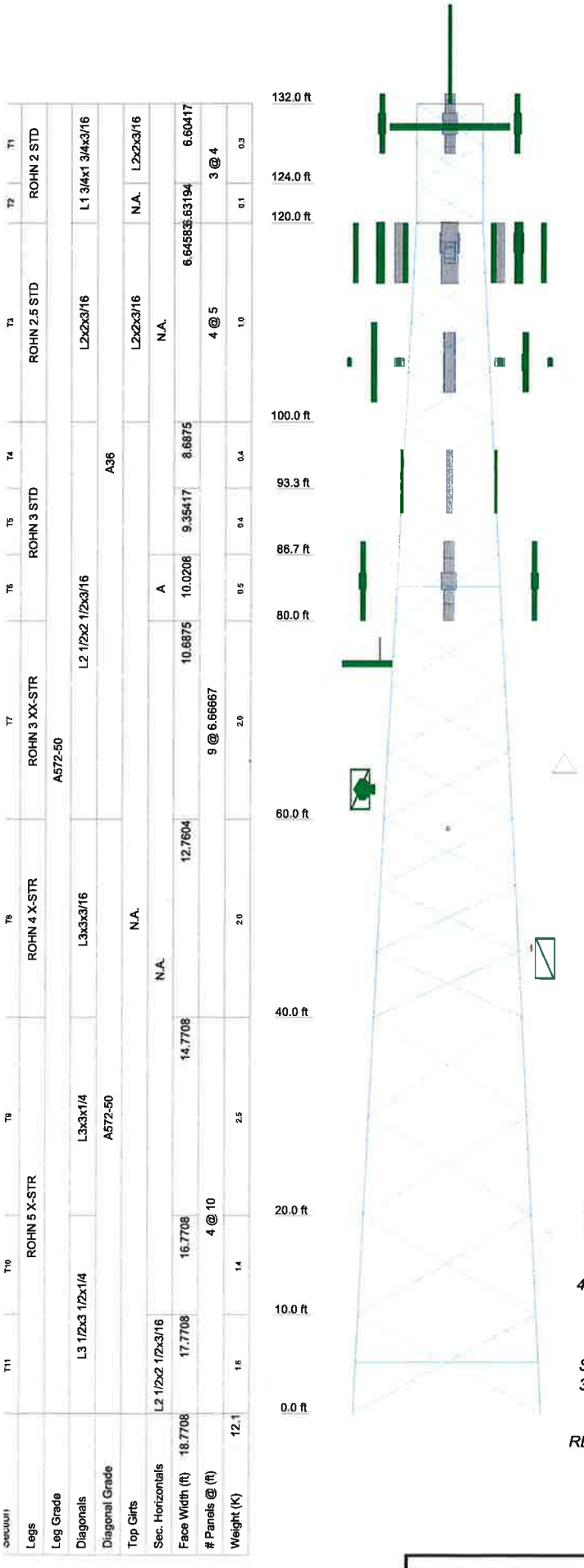
SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

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

APPENDIX A

TNXTOWER OUTPUT



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 84.1%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 178 K
SHEAR: 21 K

UPLIFT: -150 K
SHEAR: 18 K

AXIAL 139 K
SHEAR 8 K
MOMENT 741 kip-ft

TORQUE 2 kip-ft
40 mph WIND - 1.00 in ICE

AXIAL 37 K
SHEAR 34 K
MOMENT 2685 kip-ft

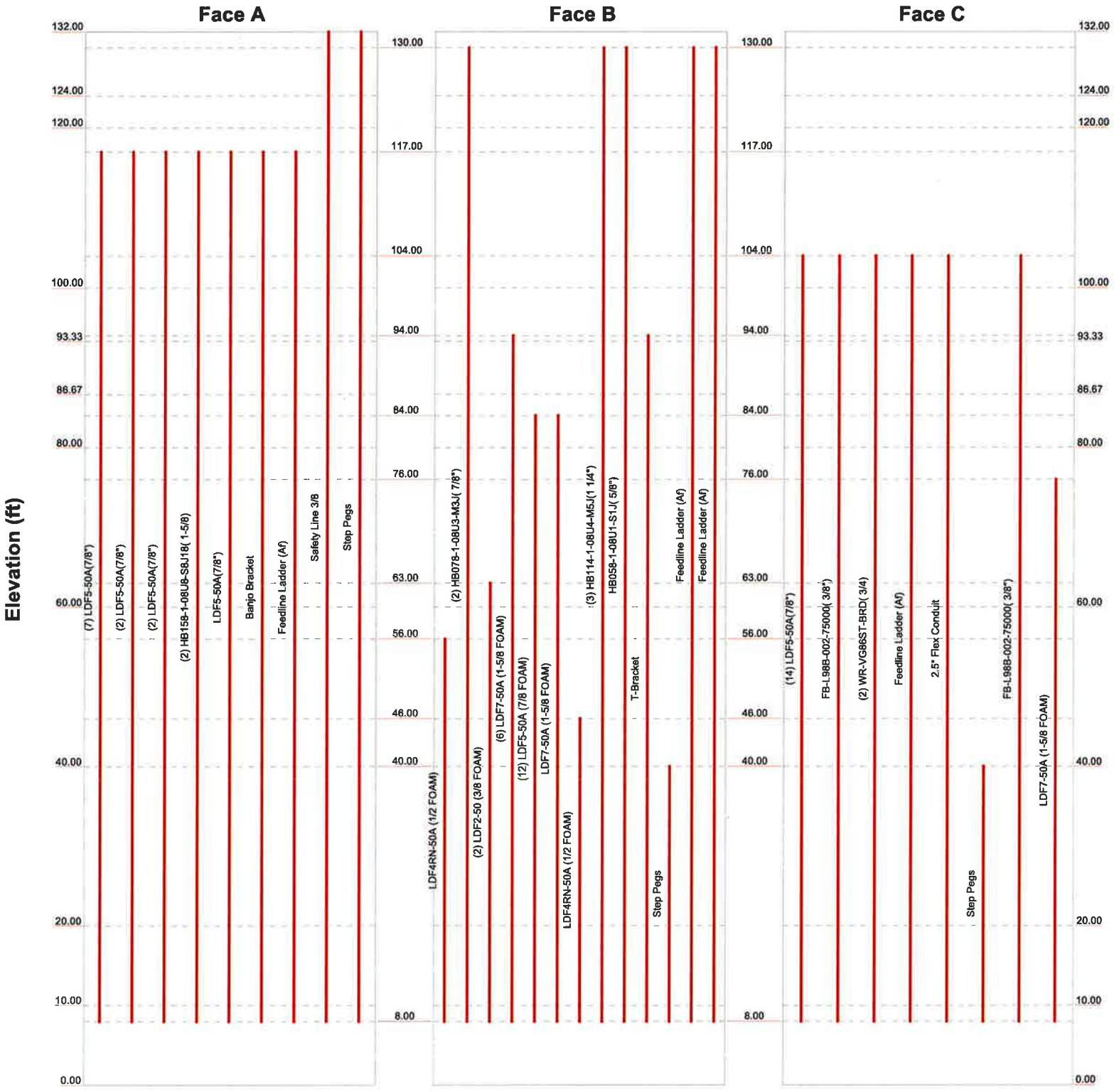
TORQUE 9 kip-ft
REACTIONS - 96 mph WIND

SSOE Group
320 Seven Springs Way Suite #350
Brentwood, TN 37027
Phone: (615) 823-1386
FAX:

Job: BU 806377 HRT 084 943242			
Project: 017-00651-00			
Client: CCI	Drawn by: 15909	App'd:	
Code: TIA-222-G	Date: 06/13/17	Scale: N	
Path:		Dwg No.	

0' - 132'

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



SSOE Group
320 Seven Springs Way Suite #350
Brentwood, TN 37027
Phone: (615) 823-1386
FAX:

Job: BU 806377 HRT 084 943242			
Project: 017-00651-00			
Client: CCI	Drawn by: 15909	App'd:	
Code: TIA-222-G	Date: 06/13/17	Scale: N	
Path:		Dwg No.	

tnxTower	Job	Page
	BU 806377 HRT 084 943242	1 of 32
SSOE Group 320 Seven Springs Way Suite #350 Brentwood, TN 37027 Phone: (615) 823-1386 FAX:	Project 017-00651-00	Date 11:35:23 06/13/17
	Client CCI	Designed by 15909

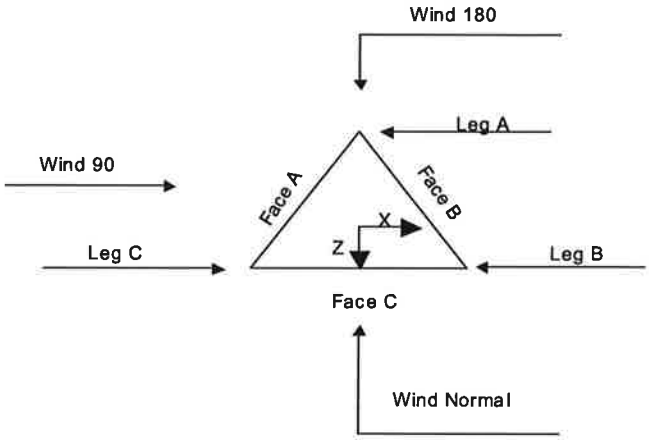
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 132.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.60 ft at the top and 18.77 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 96 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
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	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	132.00-124.00			6.60	1	8.00
T2	124.00-120.00			6.63	1	4.00
T3	120.00-100.00			6.65	1	20.00
T4	100.00-93.33			8.69	1	6.67
T5	93.33-86.67			9.35	1	6.67
T6	86.67-80.00			10.02	1	6.67
T7	80.00-60.00			10.69	1	20.00
T8	60.00-40.00			12.76	1	20.00
T9	40.00-20.00			14.77	1	20.00
T10	20.00-10.00			16.77	1	10.00
T11	10.00-0.00			17.77	1	10.00

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	132.00-124.00	4.00	X Brace	No	No	0.00	0.00
T2	124.00-120.00	4.00	X Brace	No	No	0.00	0.00
T3	120.00-100.00	5.00	X Brace	No	No	0.00	0.00
T4	100.00-93.33	6.67	X Brace	No	No	0.00	0.00

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	93.33-86.67	6.67	X Brace	No	No	0.00	0.00
T6	86.67-80.00	6.67	X Brace	No	Yes	0.00	0.00
T7	80.00-60.00	6.67	X Brace	No	No	0.00	0.00
T8	60.00-40.00	6.67	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T10	20.00-10.00	10.00	X Brace	No	No	0.00	0.00
T11	10.00-0.00	10.00	X Brace	No	Yes	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 132.00-124.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 124.00-120.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 100.00-93.33	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 93.33-86.67	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 86.67-80.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	Pipe	ROHN 3 XX-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T10 20.00-10.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 10.00-0.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 132.00-124.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T3 120.00-100.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
ft						
T6 86.67-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 10.00-0.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 132.00-124.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T2 124.00-120.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T3 120.00-100.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T4 100.00-93.33	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T5 93.33-86.67	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T6 86.67-80.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T7 80.00-60.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T8 60.00-40.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T9 40.00-20.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T10 20.00-10.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T11 10.00-0.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft															
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
132.00-124.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
124.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	0.5	1	1	1
100.00-93.33				1	1	1	1	1	1	1	1	0.5	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	0.5	1	1	1

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
93.33-86.67				1	1	1	1	1	0.5	1
T6	No	Yes	1	1	1	1	1	1	0.5	1
86.67-80.00				1	1	1	1	1	0.5	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	0.5	1
20.00-10.00				1	1	1	1	1	0.5	1
T11	No	Yes	1	1	1	1	1	1	0.5	1
10.00-0.00				1	1	1	1	1	0.5	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 132.00-124.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 124.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 100.00-93.33	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 93.33-86.67	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 86.67-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-10.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T11 10.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 132.00-124.00	Flange	0.00 A325N	0	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T2 124.00-120.00	Flange	0.63 A325N	4	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T3 120.00-100.00	Flange	0.75 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T4 100.00-93.33	Flange	0.88 A325N	0	0.63 A325N	1	0.50 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T5 93.33-86.67	Flange	0.88 A325N	0	0.63 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T6 86.67-80.00	Flange	0.88 A325N	4	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1
T7 80.00-60.00	Flange	0.88 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T8 60.00-40.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T9 40.00-20.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T10 20.00-10.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T11 10.00-0.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1

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
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.4	7	7	1.00	1.09		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.32	2	1	1.00	1.09		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.34	2	1	1.00	1.09		0.00
HB158-1-08U8-S8J18(1-5/8)	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.46	2	2	1.00	1.98		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.45	1	1	1.00	1.09		0.00
Banjo Bracket	A	No	Af (CaAa)	117.00 - 8.00	0.00	0.33	1	1	1.00	0.50		0.01
Feedline Ladder (Af)	A	No	Af (CaAa)	117.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
Safety Line 3/8	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.38		0.00
Step Pegs	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.80		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	56.00 - 8.00	0.00	-0.43	1	1	1.00	0.63		0.00
HB078-1-08U3-M3J(7/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	-0.39	2	2	1.00	1.09		0.00
LDF2-50 (3/8 FOAM)	B	No	Ar (CaAa)	63.00 - 8.00	0.00	-0.37	2	2	1.00	0.44		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	94.00 - 8.00	-25.00	0.35	6	2	1.00	1.98		0.00
LDF5-50A	B	No	Ar (CaAa)	84.00 - 8.00	-20.00	0.4	12	3	1.00	1.09		0.00

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
(7/8 FOAM)												
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	84.00 - 8.00	-25.00	0.4	1	1	1.00	1.98		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	46.00 - 8.00	2.00	0.4	1	1	1.00	0.63		0.00
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.4	3	3	1.00	1.54		0.00
HB058-1-08U1-S1J(5/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.38	1	1	1.00	0.84		0.00
T-Bracket	B	No	Af (CaAa)	94.00 - 8.00	-10.00	0.4	1	1	1.00	1.00		0.01
Step Pegs	B	No	Ar (CaAa)	40.00 - 8.00	0.00	0.5	1	1	1.00	0.80		0.00
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
LDF5-50A(7/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.4	14	12	1.00	1.09		0.00
FB-L98B-002-75000(3/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.47	1	1	1.00	0.39		0.00
WR-VG86ST-BRD(3/4)	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	2	2	1.00	0.00		0.00
Feedline Ladder (Af)	C	No	Af (CaAa)	104.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
2.5" Flex Conduit	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	1	1	1.00	2.50		0.00
Step Pegs	C	No	Ar (CaAa)	40.00 - 8.00	0.00	-0.5	1	1	1.00	0.80		0.00
FB-L98B-002-75000(3/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	1	1	1.00	0.00		0.00
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	76.00 - 8.00	0.00	0.49	1	1	1.00	1.98		0.00

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	132.00-124.00	A	0.000	0.000	0.940	0.000	0.02
		B	0.000	0.000	10.584	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	0.000	0.000	0.470	0.000	0.01
		B	0.000	0.000	7.056	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	0.000	0.000	41.235	0.000	0.48
		B	0.000	0.000	35.280	0.000	0.45
		C	0.000	0.000	9.261	0.000	0.06
T4	100.00-93.33	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	12.663	0.000	0.16
		C	0.000	0.000	15.436	0.000	0.10
T5	93.33-86.67	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	20.791	0.000	0.25
		C	0.000	0.000	15.436	0.000	0.10
T6	86.67-80.00	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	26.815	0.000	0.27
		C	0.000	0.000	15.436	0.000	0.10
T7	80.00-60.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	92.757	0.000	0.84
		C	0.000	0.000	49.475	0.000	0.31

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
T8	60.00-40.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	95.639	0.000	0.85
		C	0.000	0.000	50.267	0.000	0.31
T9	40.00-20.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	98.373	0.000	0.90
		C	0.000	0.000	51.867	0.000	0.37
T10	20.00-10.00	A	0.000	0.000	24.048	0.000	0.28
		B	0.000	0.000	49.187	0.000	0.45
		C	0.000	0.000	25.934	0.000	0.18
T11	10.00-0.00	A	0.000	0.000	4.810	0.000	0.06
		B	0.000	0.000	9.837	0.000	0.09
		C	0.000	0.000	5.187	0.000	0.04

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	132.00-124.00	A	2.290	0.000	0.000	8.269	0.000	0.15
		B		0.000	0.000	31.531	0.000	0.62
		C		0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	2.279	0.000	0.000	4.117	0.000	0.08
		B		0.000	0.000	20.964	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	2.256	0.000	0.000	160.366	0.000	2.93
		B		0.000	0.000	104.215	0.000	2.03
		C		0.000	0.000	28.742	0.000	0.51
T4	100.00-93.33	A	2.227	0.000	0.000	61.233	0.000	1.11
		B		0.000	0.000	36.195	0.000	0.71
		C		0.000	0.000	47.622	0.000	0.84
T5	93.33-86.67	A	2.211	0.000	0.000	60.984	0.000	1.10
		B		0.000	0.000	51.346	0.000	1.07
		C		0.000	0.000	47.468	0.000	0.83
T6	86.67-80.00	A	2.194	0.000	0.000	60.718	0.000	1.09
		B		0.000	0.000	61.289	0.000	1.28
		C		0.000	0.000	47.303	0.000	0.82
T7	80.00-60.00	A	2.156	0.000	0.000	180.365	0.000	3.20
		B		0.000	0.000	205.286	0.000	4.21
		C		0.000	0.000	150.871	0.000	2.61
T8	60.00-40.00	A	2.085	0.000	0.000	177.004	0.000	3.07
		B		0.000	0.000	228.524	0.000	4.39
		C		0.000	0.000	151.024	0.000	2.56
T9	40.00-20.00	A	1.981	0.000	0.000	172.116	0.000	2.89
		B		0.000	0.000	240.171	0.000	4.48
		C		0.000	0.000	157.110	0.000	2.61
T10	20.00-10.00	A	1.848	0.000	0.000	82.938	0.000	1.34
		B		0.000	0.000	115.659	0.000	2.09
		C		0.000	0.000	76.095	0.000	1.21
T11	10.00-0.00	A	1.656	0.000	0.000	15.685	0.000	0.24
		B		0.000	0.000	21.850	0.000	0.38
		C		0.000	0.000	14.506	0.000	0.22

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	132.00-124.00	2.82	-1.30	2.32	-1.92
T2	124.00-120.00	3.44	-1.44	2.88	-2.03
T3	120.00-100.00	2.45	-4.23	1.96	-4.49
T4	100.00-93.33	4.50	-2.03	3.96	-2.62
T5	93.33-86.67	5.17	-1.02	4.50	-2.12
T6	86.67-80.00	5.76	-0.37	4.74	-1.78
T7	80.00-60.00	6.59	0.11	5.22	-1.61
T8	60.00-40.00	7.40	-0.14	5.88	-2.07
T9	40.00-20.00	8.89	-0.05	7.59	-1.85
T10	20.00-10.00	9.60	-0.10	8.32	-2.00
T11	10.00-0.00	4.82	-0.06	4.72	-1.10

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	10	Safety Line 3/8	124.00 - 132.00	0.6000	0.5030
T1	11	Step Pegs	124.00 - 132.00	0.6000	0.5030
T1	14	HB078-1-08U3-M3J(7/8")	124.00 - 130.00	0.6000	0.5030
T1	20	HB114-1-08U4-M5J(1 1/4")	124.00 - 130.00	0.6000	0.5030
T1	21	HB058-1-08U1-S1J(5/8")	124.00 - 130.00	0.6000	0.5030
T1	24	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5030
T1	25	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5030
T2	10	Safety Line 3/8	120.00 - 124.00	0.6000	0.5660
T2	11	Step Pegs	120.00 - 124.00	0.6000	0.5660
T2	14	HB078-1-08U3-M3J(7/8")	120.00 - 124.00	0.6000	0.5660
T2	20	HB114-1-08U4-M5J(1 1/4")	120.00 - 124.00	0.6000	0.5660
T2	21	HB058-1-08U1-S1J(5/8")	120.00 - 124.00	0.6000	0.5660
T2	24	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5660
T2	25	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5660
T3	2	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	3	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	4	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	6	HB158-1-08U8-S8J18(1-5/8)	100.00 - 117.00	0.6000	0.5973
T3	7	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5973
T3	8	Banjo Bracket	100.00 -	0.6000	0.5973

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	9	Feedline Ladder (Af)	100.00 - 117.00	0.6000	0.5973
T3	10	Safety Line 3/8	100.00 - 117.00	0.6000	0.5973
T3	11	Step Pegs	100.00 - 120.00	0.6000	0.5973
T3	14	HB078-1-08U3-M3J(7/8")	100.00 - 120.00	0.6000	0.5973
T3	20	HB114-1-08U4-M5J(1 1/4")	100.00 - 120.00	0.6000	0.5973
T3	21	HB058-1-08U1-S1J(5/8")	100.00 - 120.00	0.6000	0.5973
T3	24	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5973
T3	25	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5973
T3	27	LDF5-50A(7/8")	100.00 - 104.00	0.6000	0.5973
T3	28	FB-L98B-002-75000(3/8")	100.00 - 104.00	0.6000	0.5973
T3	29	WR-VG86ST-BRD(3/4)	100.00 - 104.00	0.6000	0.5973
T3	30	Feedline Ladder (Af)	100.00 - 104.00	0.6000	0.5973
T3	31	2.5" Flex Conduit	100.00 - 104.00	0.6000	0.5973
T3	33	FB-L98B-002-75000(3/8")	100.00 - 104.00	0.6000	0.5973
T4	2	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	3	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	4	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	6	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T4	7	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	8	Banjo Bracket	93.33 - 100.00	0.6000	0.6000
T4	9	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	10	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T4	11	Step Pegs	93.33 - 100.00	0.6000	0.6000
T4	14	HB078-1-08U3-M3J(7/8")	93.33 - 100.00	0.6000	0.6000
T4	16	LDF7-50A (1-5/8 FOAM)	93.33 - 94.00	0.6000	0.6000
T4	20	HB114-1-08U4-M5J(1 1/4")	93.33 - 100.00	0.6000	0.6000
T4	21	HB058-1-08U1-S1J(5/8")	93.33 - 100.00	0.6000	0.6000
T4	22	T-Bracket	93.33 - 94.00	0.6000	0.6000
T4	24	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	25	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	27	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	28	FB-L98B-002-75000(3/8")	93.33 - 100.00	0.6000	0.6000
T4	29	WR-VG86ST-BRD(3/4)	93.33 - 100.00	0.6000	0.6000
T4	30	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	31	2.5" Flex Conduit	93.33 - 100.00	0.6000	0.6000
T4	33	FB-L98B-002-75000(3/8")	93.33 - 100.00	0.6000	0.6000
T5	2	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	3	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	4	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	6	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T5	7	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	8	Banjo Bracket	86.67 - 93.33	0.6000	0.6000
T5	9	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	10	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T5	11	Step Pegs	86.67 - 93.33	0.6000	0.6000
T5	14	HB078-1-08U3-M3J(7/8")	86.67 - 93.33	0.6000	0.6000
T5	16	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	20	HB114-1-08U4-M5J(1 1/4")	86.67 - 93.33	0.6000	0.6000
T5	21	HB058-1-08U1-S1J(5/8")	86.67 - 93.33	0.6000	0.6000
T5	22	T-Bracket	86.67 - 93.33	0.6000	0.6000
T5	24	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	25	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	27	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	28	FB-L98B-002-75000(3/8")	86.67 - 93.33	0.6000	0.6000
T5	29	WR-VG86ST-BRD(3/4)	86.67 - 93.33	0.6000	0.6000
T5	30	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	31	2.5" Flex Conduit	86.67 - 93.33	0.6000	0.6000
T5	33	FB-L98B-002-75000(3/8")	86.67 - 93.33	0.6000	0.6000
T6	2	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	3	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	4	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	6	HB158-1-08U8-S8J18(1-5/8)	80.00 - 86.67	0.6000	0.6000
T6	7	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	8	Banjo Bracket	80.00 - 86.67	0.6000	0.6000
T6	9	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	10	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T6	11	Step Pegs	80.00 - 86.67	0.6000	0.6000
T6	14	HB078-1-08U3-M3J(7/8")	80.00 - 86.67	0.6000	0.6000
T6	16	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T6	17	LDF5-50A (7/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	18	LDF7-50A (1-5/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	20	HB114-1-08U4-M5J(1 1/4")	80.00 - 86.67	0.6000	0.6000
T6	21	HB058-1-08U1-S1J(5/8")	80.00 - 86.67	0.6000	0.6000
T6	22	T-Bracket	80.00 - 86.67	0.6000	0.6000
T6	24	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	25	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	27	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	28	FB-L98B-002-75000(3/8")	80.00 - 86.67	0.6000	0.6000
T6	29	WR-VG86ST-BRD(3/4)	80.00 - 86.67	0.6000	0.6000
T6	30	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	31	2.5" Flex Conduit	80.00 - 86.67	0.6000	0.6000
T6	33	FB-L98B-002-75000(3/8")	80.00 - 86.67	0.6000	0.6000
T7	2	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	3	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	4	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	6	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	7	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	8	Banjo Bracket	60.00 - 80.00	0.6000	0.6000
T7	9	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	10	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	11	Step Pegs	60.00 - 80.00	0.6000	0.6000
T7	14	HB078-1-08U3-M3J(7/8")	60.00 - 80.00	0.6000	0.6000
T7	15	LDF2-50 (3/8 FOAM)	60.00 - 63.00	0.6000	0.6000
T7	16	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	17	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	18	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	20	HB114-1-08U4-M5J(1 1/4")	60.00 - 80.00	0.6000	0.6000
T7	21	HB058-1-08U1-S1J(5/8")	60.00 - 80.00	0.6000	0.6000
T7	22	T-Bracket	60.00 - 80.00	0.6000	0.6000
T7	24	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	25	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	27	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	28	FB-L98B-002-75000(3/8")	60.00 - 80.00	0.6000	0.6000
T7	29	WR-VG86ST-BRD(3/4)	60.00 - 80.00	0.6000	0.6000
T7	30	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	31	2.5" Flex Conduit	60.00 - 80.00	0.6000	0.6000
T7	33	FB-L98B-002-75000(3/8")	60.00 - 80.00	0.6000	0.6000
T7	34	LDF7-50A (1-5/8 FOAM)	60.00 - 76.00	0.6000	0.6000
T8	2	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	3	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	4	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	6	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	7	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	8	Banjo Bracket	40.00 - 60.00	0.6000	0.6000
T8	9	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	10	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	11	Step Pegs	40.00 - 60.00	0.6000	0.6000
T8	13	LDF4RN-50A (1/2 FOAM)	40.00 - 56.00	0.6000	0.6000
T8	14	HB078-1-08U3-M3J(7/8")	40.00 - 60.00	0.6000	0.6000
T8	15	LDF2-50 (3/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	16	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	17	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	18	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	19	LDF4RN-50A (1/2 FOAM)	40.00 - 46.00	0.6000	0.6000
T8	20	HB114-1-08U4-M5J(1 1/4")	40.00 - 60.00	0.6000	0.6000
T8	21	HB058-1-08U1-S1J(5/8")	40.00 - 60.00	0.6000	0.6000
T8	22	T-Bracket	40.00 - 60.00	0.6000	0.6000
T8	24	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	25	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	27	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	28	FB-L98B-002-75000(3/8")	40.00 - 60.00	0.6000	0.6000
T8	29	WR-VG86ST-BRD(3/4)	40.00 - 60.00	0.6000	0.6000
T8	30	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	31	2.5" Flex Conduit	40.00 - 60.00	0.6000	0.6000
T8	33	FB-L98B-002-75000(3/8")	40.00 - 60.00	0.6000	0.6000
T8	34	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T9	2	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	3	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	4	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	6	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	7	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	8	Banjo Bracket	20.00 - 40.00	0.6000	0.6000
T9	9	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	10	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	11	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	13	LDF4RN-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	14	HB078-1-08U3-M3J(7/8")	20.00 - 40.00	0.6000	0.6000
T9	15	LDF2-50 (3/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	16	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	17	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	18	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	19	LDF4RN-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	20	HB114-1-08U4-M5J(1 1/4")	20.00 - 40.00	0.6000	0.6000
T9	21	HB058-1-08U1-S1J(5/8")	20.00 - 40.00	0.6000	0.6000
T9	22	T-Bracket	20.00 - 40.00	0.6000	0.6000
T9	23	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	24	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	25	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	27	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	28	FB-L98B-002-75000(3/8")	20.00 - 40.00	0.6000	0.6000
T9	29	WR-VG86ST-BRD(3/4)	20.00 - 40.00	0.6000	0.6000
T9	30	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	31	2.5" Flex Conduit	20.00 - 40.00	0.6000	0.6000
T9	32	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	33	FB-L98B-002-75000(3/8")	20.00 - 40.00	0.6000	0.6000
T9	34	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T10	2	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	3	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	4	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	6	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000
T10	7	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	8	Banjo Bracket	10.00 - 20.00	0.6000	0.6000
T10	9	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	10	Safety Line 3/8	10.00 - 20.00	0.6000	0.6000
T10	11	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	13	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	14	HB078-1-08U3-M3J(7/8")	10.00 - 20.00	0.6000	0.6000
T10	15	LDF2-50 (3/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	16	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	17	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	18	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	19	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	20	HB114-1-08U4-M5J(1 1/4")	10.00 - 20.00	0.6000	0.6000
T10	21	HB058-1-08U1-S1J(5/8")	10.00 - 20.00	0.6000	0.6000
T10	22	T-Bracket	10.00 - 20.00	0.6000	0.6000
T10	23	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	24	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	25	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	27	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	28	FB-L98B-002-75000(3/8")	10.00 - 20.00	0.6000	0.6000
T10	29	WR-VG86ST-BRD(3/4)	10.00 - 20.00	0.6000	0.6000
T10	30	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	31	2.5" Flex Conduit	10.00 - 20.00	0.6000	0.6000
T10	32	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	33	FB-L98B-002-75000(3/8")	10.00 - 20.00	0.6000	0.6000
T10	34	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T11	2	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	3	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	4	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	6	HB158-1-08U8-S8J18(1-5/8)	8.00 - 10.00	0.6000	0.6000
T11	7	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	8	Banjo Bracket	8.00 - 10.00	0.6000	0.6000
T11	9	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	10	Safety Line 3/8	8.00 - 10.00	0.6000	0.6000
T11	11	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	13	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	14	HB078-1-08U3-M3J(7/8")	8.00 - 10.00	0.6000	0.6000
T11	15	LDF2-50 (3/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	16	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	17	LDF5-50A (7/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	18	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	19	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	20	HB114-1-08U4-M5J(1 1/4")	8.00 - 10.00	0.6000	0.6000
T11	21	HB058-1-08U1-S1J(5/8")	8.00 - 10.00	0.6000	0.6000
T11	22	T-Bracket	8.00 - 10.00	0.6000	0.6000
T11	23	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	24	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	25	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	27	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	28	FB-L98B-002-75000(3/8")	8.00 - 10.00	0.6000	0.6000
T11	29	WR-VG86ST-BRD(3/4)	8.00 - 10.00	0.6000	0.6000
T11	30	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	31	2.5" Flex Conduit	8.00 - 10.00	0.6000	0.6000
T11	32	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	33	FB-L98B-002-75000(3/8")	8.00 - 10.00	0.6000	0.6000
T11	34	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000

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
3" x 10' mount pipe	B	None		0.00	137.00	No Ice	3.00	3.00	0.03
						1/2" Ice	4.03	4.03	0.05
						1" Ice	5.03	5.03	0.08
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
1900MHZ RRH (65MHz)	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
800MHz 2x50W RRH W/FILTER	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
800MHz 2x50W RRH W/FILTER	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
1900MHZ RRH (65MHz)	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
DB413-B	B	From Leg	4.00 0.00 11.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.55 4.59 6.63	2.55 4.59 6.63	0.03 0.04 0.05
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
800MHz 2x50W RRH W/FILTER	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
1900MHZ RRH (65MHz)	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
T-Arm Mount [TA 702-3]	C	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	5.64 6.55 7.46	5.64 6.55 7.46	0.34 0.43 0.52

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LBX-6515DS-T0M w/ Mount Pipe	A	From Leg	4.00	0.00	117.00	No Ice	8.60	6.10	0.05
			0.00			1/2" Ice	9.17	7.27	0.11
			0.00			1" Ice	9.69	8.16	0.19
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.00	117.00	No Ice	8.16	6.82	0.06
			0.00			1/2" Ice	8.62	7.78	0.13
			0.00			1" Ice	9.09	8.61	0.20
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.00	117.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
QUAD656C0000X w/ Mount Pipe	A	From Leg	4.00	0.00	117.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			0.00			1" Ice	14.68	9.50	0.28
B13 RRH 4X30	A	From Leg	4.00	0.00	117.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B25 RRH2x60 PCS	A	From Leg	4.00	0.00	117.00	No Ice	2.14	1.31	0.05
			0.00			1/2" Ice	2.33	1.46	0.07
			0.00			1" Ice	2.53	1.63	0.09
B66A RRH4X45	A	From Leg	4.00	0.00	117.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
AIRSCALE RRH 4T4R B5 160W	A	From Leg	4.00	0.00	117.00	No Ice	1.29	0.72	0.04
			0.00			1/2" Ice	1.43	0.83	0.05
			0.00			1" Ice	1.58	0.96	0.06
LBX-6515DS-T0M w/ Mount Pipe	B	From Leg	4.00	0.00	117.00	No Ice	8.60	6.10	0.05
			0.00			1/2" Ice	9.17	7.27	0.11
			0.00			1" Ice	9.69	8.16	0.19
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.00	117.00	No Ice	8.16	6.82	0.06
			0.00			1/2" Ice	8.62	7.78	0.13
			0.00			1" Ice	9.09	8.61	0.20
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.00	117.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
QUAD656C0000X w/ Mount Pipe	B	From Leg	4.00	0.00	117.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			0.00			1" Ice	14.68	9.50	0.28
B13 RRH 4X30	B	From Leg	4.00	0.00	117.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B25 RRH2x60 PCS	B	From Leg	4.00	0.00	117.00	No Ice	2.14	1.31	0.05
			0.00			1/2" Ice	2.33	1.46	0.07
			0.00			1" Ice	2.53	1.63	0.09
B66A RRH4X45	B	From Leg	4.00	0.00	117.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
AIRSCALE RRH 4T4R B5 160W	B	From Leg	4.00	0.00	117.00	No Ice	1.29	0.72	0.04
			0.00			1/2" Ice	1.43	0.83	0.05
			0.00			1" Ice	1.58	0.96	0.06
LNX-6514DS-T4M w/ Mount Pipe	C	From Leg	4.00	0.00	117.00	No Ice	8.32	7.00	0.06
			0.00			1/2" Ice	8.88	8.19	0.13
			0.00			1" Ice	9.40	9.08	0.20
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	117.00	No Ice	8.16	6.82	0.06
			0.00			1/2" Ice	8.62	7.78	0.13
			0.00			1" Ice	9.09	8.61	0.20
QUAD656C0000X w/ Mount Pipe	C	From Leg	4.00	0.00	117.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			0.00			1" Ice	14.68	9.50	0.28

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
B13 RRH 4X30	C	From Leg	4.00	0.00	117.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B25 RRH2x60 PCS	C	From Leg	4.00	0.00	117.00	No Ice	2.14	1.31	0.05
			0.00			1/2" Ice	2.33	1.46	0.07
			0.00			1" Ice	2.53	1.63	0.09
B66A RRH4X45	C	From Leg	4.00	0.00	117.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
AIRSCALE RRH 4T4R B5 160W	C	From Leg	4.00	0.00	117.00	No Ice	1.29	0.72	0.04
			0.00			1/2" Ice	1.43	0.83	0.05
			0.00			1" Ice	1.58	0.96	0.06
Sector Mount [SM 504-3]	C	None		0.00	117.00	No Ice	34.25	34.25	1.71
						1/2" Ice	48.98	48.98	2.29
						1" Ice	63.71	63.71	2.86
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			2.00			1" Ice	9.46	10.55	0.30
(2) 782-10250	A	From Leg	4.00	0.00	104.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02
RRUS-11	A	From Leg	4.00	0.00	104.00	No Ice	0.00	1.37	0.05
			0.00			1/2" Ice	0.00	1.55	0.07
			2.00			1" Ice	0.00	1.74	0.09
DC6-48-60-18-8F	A	From Leg	4.00	0.00	104.00	No Ice	2.20	2.20	0.02
			0.00			1/2" Ice	2.40	2.40	0.04
			2.00			1" Ice	2.60	2.60	0.07
(2) DTMABP7819VG12A	A	From Leg	4.00	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
(2) 860 10025	A	From Leg	4.00	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	A	From Leg	4.00	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	A	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			2.00			1" Ice	9.46	10.55	0.30
(2) 782-10250	B	From Leg	4.00	0.00	104.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS-11	B	From Leg	4.00	0.00	104.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			2.00			1" Ice	3.21	1.49	0.09
(2) DTMABP7819VG12A	B	From Leg	4.00	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
(2) 860 10025	B	From Leg	4.00	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	B	From Leg	4.00	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	B	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
DC6-48-60-18-8F	B	From Leg	4.00	0.00	104.00	No Ice	2.20	2.20	0.02
			0.00			1/2" Ice	2.40	2.40	0.04
			2.00			1" Ice	2.60	2.60	0.07
800 10121 w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	13.21	9.58	0.10
			0.00			1/2" Ice	13.90	11.05	0.20
			2.00			1" Ice	14.59	12.50	0.30
SBNH-1D6565C w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	11.68	9.84	0.09
			0.00			1/2" Ice	12.40	11.37	0.18
			2.00			1" Ice	13.14	12.91	0.28
TPA-65R-LCUUUU-H8-K w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	13.54	10.96	0.13
			0.00			1/2" Ice	14.24	12.49	0.23
			2.00			1" Ice	14.95	14.04	0.34
(2) 782-10250	C	From Leg	3.91	0.00	104.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02
(2) DTMABP7819VG12A	C	From Leg	3.91	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
RRUS-11	C	From Leg	3.91	0.00	104.00	No Ice	0.00	1.37	0.05
			0.00			1/2" Ice	0.00	1.55	0.07
			2.00			1" Ice	0.00	1.74	0.09
(2) 860 10025	C	From Leg	3.91	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	C	From Leg	3.91	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	C	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
Sector Mount [SM 504-3]	C	None		0.00	104.00	No Ice	34.25	34.25	1.71
						1/2" Ice	48.98	48.98	2.29
						1" Ice	63.71	63.71	2.86
742 213 w/ Mount Pipe	A	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
742 213 w/ Mount Pipe	B	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15

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
742 213 w/ Mount Pipe	C	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	11.41	9.60	0.08
			0.00			1/2" Ice	12.03	11.02	0.17
			0.00			1" Ice	12.65	12.29	0.26
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	A	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
RRUS 11 B12	A	From Leg	4.00	0.00	84.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	11.41	9.60	0.08
			0.00			1/2" Ice	12.03	11.02	0.17
			0.00			1" Ice	12.65	12.29	0.26
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	B	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
RRUS 11 B12	B	From Leg	4.00	0.00	84.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	11.41	9.60	0.08
			0.00			1/2" Ice	12.03	11.02	0.17
			0.00			1" Ice	12.65	12.29	0.26
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	C	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
RRUS 11 B12	C	From Leg	4.00	0.00	84.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
Sector Mount [SM 308-3]	C	None		0.00	84.00	No Ice	22.34	22.34	0.38
						1/2" Ice	31.70	31.70	0.83
						1" Ice	41.06	41.06	1.28
Side Arm Mount [SO 305-1]	C	From Leg	3.00	0.00	76.00	No Ice	0.94	1.41	0.03
			0.00			1/2" Ice	1.48	2.17	0.04
			0.00			1" Ice	2.02	2.93	0.06
HG2409U-PRO	C	From Leg	1.50	0.00	76.00	No Ice	0.38	0.38	0.00
			0.00			1/2" Ice	0.54	0.54	0.01
			1.00			1" Ice	0.72	0.72	0.01

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
RDL-3000	C	From Leg	1.50	0.00	63.00	No Ice	1.01	0.26	0.01
			0.00			1/2" Ice	1.13	0.34	0.01
			0.00			1" Ice	1.27	0.42	0.02
Side Arm Mount [SO 311-1]	C	From Leg	3.00	0.00	63.00	No Ice	2.97	3.51	0.06
			0.00			1/2" Ice	4.39	5.33	0.09
			0.00			1" Ice	5.81	7.15	0.13
GPS-TMG-20N	A	From Leg	1.50	0.00	56.00	No Ice	0.13	0.13	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			3.00			1" Ice	0.24	0.24	0.01
Side Arm Mount [SO 311-1]	A	From Leg	3.00	0.00	56.00	No Ice	2.97	3.51	0.06
			0.00			1/2" Ice	4.39	5.33	0.09
			0.00			1" Ice	5.81	7.15	0.13
KS24019-L112A	B	From Leg	1.50	0.00	46.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			1.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	B	From Leg	3.00	0.00	46.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09

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
MPRC2449	C	Paraboloid w/Radome	From Leg	0.00	90.00		63.00	2.17	No Ice	3.69	0.02
				3.00					1/2" Ice	3.98	0.04
				0.00					1" Ice	4.27	0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice

Comb. No.	Description
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	132 - 124	Leg	Max Tension	7	1.32	0.14	0.00
			Max. Compression	31	-3.48	-0.02	-0.00
			Max. Mx	10	-1.11	-0.50	0.00
			Max. My	4	-0.69	-0.00	0.55
			Max. Vy	10	-0.40	0.28	0.00
			Max. Vx	4	0.43	-0.00	-0.28
		Diagonal	Max Tension	24	1.16	0.00	0.00
			Max. Compression	12	-1.12	0.00	0.00
			Max. Mx	28	0.28	0.03	0.00
			Max. My	12	-1.10	0.00	0.00
			Max. Vy	29	-0.03	0.03	-0.00
			Max. Vx	12	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.08	0.00	0.00
			Max. Compression	11	-0.07	0.00	0.00
			Max. Mx	26	0.00	-0.09	0.00
			Max. My	27	0.00	0.00	0.00
			Max. Vy	26	-0.06	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	27	-0.00	0.00	0.00
T2	124 - 120	Leg	Max Tension	7	3.22	-0.34	-0.00
			Max. Compression	10	-4.75	0.32	0.01
			Max. Mx	14	2.88	-0.35	0.01
			Max. My	4	-0.92	-0.02	-0.34
			Max. Vy	14	0.14	-0.35	0.01
			Max. Vx	16	-0.13	-0.01	0.34
		Diagonal	Max Tension	24	1.00	0.00	0.00
			Max. Compression	24	-1.03	0.00	0.00
			Max. Mx	31	0.18	0.03	0.00
			Max. My	5	-0.88	0.00	-0.00
			Max. Vy	31	-0.03	0.03	0.00
			Max. Vx	5	0.00	0.00	-0.00
T3	120 - 100	Leg	Max Tension	7	19.37	-0.49	0.00
			Max. Compression	2	-27.20	0.21	0.02
			Max. Mx	14	3.42	1.11	0.01
			Max. My	20	-2.31	-0.03	1.11
			Max. Vy	6	-1.02	-0.50	0.00
			Max. Vx	12	-1.01	-0.02	-0.32
		Diagonal	Max Tension	20	3.81	0.00	0.00
			Max. Compression	20	-3.86	0.00	0.00
			Max. Mx	38	0.12	0.05	-0.01
			Max. My	20	-3.82	0.00	0.01
			Max. Vy	28	0.05	0.04	0.01
			Max. Vx	29	0.00	0.00	0.00
		Top Girt	Max Tension	6	0.24	0.00	0.00
			Max. Compression	19	-0.15	0.00	0.00
			Max. Mx	26	0.12	-0.09	0.00
			Max. My	32	0.15	0.00	0.00
			Max. Vy	26	0.06	0.00	0.00
			Max. Vx	32	-0.00	0.00	0.00
T4	100 - 93.3333	Leg	Max Tension	7	27.09	-0.11	-0.00
			Max. Compression	2	-35.95	0.16	-0.03
			Max. Mx	6	26.12	-0.27	0.00
			Max. My	24	-4.09	-0.03	0.46
			Max. Vy	18	-0.15	0.16	0.00
			Max. Vx	8	0.13	-0.03	0.44
		Diagonal	Max Tension	20	4.52	0.00	0.00
			Max. Compression	20	-4.56	0.00	0.00
			Max. Mx	27	0.88	0.08	-0.01
			Max. My	32	0.62	0.07	0.01
			Max. Vy	27	-0.06	0.08	-0.01
			Max. Vx	32	-0.00	0.00	0.00
T5	93.3333 - 86.6667	Leg	Max Tension	7	35.76	-0.04	-0.00
			Max. Compression	2	-45.45	-0.02	-0.01
			Max. Mx	18	-44.46	0.16	0.00
			Max. My	4	-4.98	-0.04	-0.35
			Max. Vy	18	0.07	0.16	0.00
			Max. Vx	4	0.11	-0.04	-0.35
		Diagonal	Max Tension	20	4.61	0.00	0.00
			Max. Compression	20	-4.63	0.00	0.00
			Max. Mx	27	0.84	0.08	-0.01
			Max. My	29	-0.80	0.07	-0.01
			Max. Vy	29	0.06	0.07	-0.01
			Max. Vx	29	0.00	0.00	0.00
T6	86.6667 - 80	Leg	Max Tension	7	44.34	-0.04	-0.00
			Max. Compression	2	-55.47	-0.08	-0.00
			Max. Mx	2	-55.44	0.46	-0.00
			Max. My	4	-5.27	-0.04	-0.35
			Max. Vy	22	0.72	-0.36	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	16	-0.49	0.04	-0.01
		Diagonal	Max Tension	13	5.55	0.03	-0.00
			Max. Compression	12	-5.75	0.00	0.00
			Max. Mx	27	0.89	0.09	0.01
			Max. My	29	0.89	0.09	-0.01
			Max. Vy	27	-0.06	0.09	0.01
			Max. Vx	29	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	2	0.96	0.00	0.00
			Max. Compression	2	-0.96	0.01	-0.00
			Max. Mx	31	-0.33	0.05	0.00
			Max. My	29	-0.15	0.05	0.00
			Max. Vy	31	-0.04	0.05	0.00
			Max. Vx	30	-0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	7	72.12	-0.10	-0.01
			Max. Compression	10	-87.17	0.23	-0.02
			Max. Mx	11	-85.05	0.24	-0.02
			Max. My	12	-6.28	-0.01	-0.24
			Max. Vy	14	0.09	-0.23	-0.02
			Max. Vx	12	0.10	-0.01	-0.24
		Diagonal	Max Tension	12	5.78	0.00	0.00
			Max. Compression	12	-5.81	0.00	0.00
			Max. Mx	29	0.81	0.11	-0.01
			Max. My	27	0.15	0.10	-0.02
			Max. Vy	29	0.08	0.11	-0.01
			Max. Vx	27	-0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	7	98.33	-0.41	-0.01
			Max. Compression	10	-117.24	0.46	0.02
			Max. Mx	37	-14.79	-0.61	-0.01
			Max. My	5	-7.25	0.01	-0.31
			Max. Vy	37	0.17	-0.61	-0.01
			Max. Vx	10	-0.09	-0.12	0.27
		Diagonal	Max Tension	12	6.33	0.00	0.00
			Max. Compression	24	-6.44	0.00	0.00
			Max. Mx	31	1.17	0.16	-0.02
			Max. My	28	-0.04	0.13	-0.02
			Max. Vy	29	0.09	0.14	-0.02
			Max. Vx	28	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	7	120.90	-0.67	-0.02
			Max. Compression	10	-143.70	0.82	0.02
			Max. Mx	37	-16.46	-0.94	-0.00
			Max. My	4	-10.62	-0.08	-0.74
			Max. Vy	37	0.19	-0.94	-0.00
			Max. Vx	4	-0.15	-0.08	-0.74
		Diagonal	Max Tension	24	7.26	0.00	0.00
			Max. Compression	24	-7.47	0.00	0.00
			Max. Mx	29	0.58	0.21	-0.03
			Max. My	29	-1.60	0.19	-0.03
			Max. Vy	29	0.11	0.20	0.03
			Max. Vx	28	-0.01	0.00	0.00
T10	20 - 10	Leg	Max Tension	7	132.95	0.15	-0.01
			Max. Compression	10	-158.05	-0.40	0.00
			Max. Mx	37	-14.28	-0.94	-0.00
			Max. My	4	-12.71	-0.15	-1.19
			Max. Vy	37	-0.22	-0.94	-0.00
			Max. Vx	4	0.20	-0.15	-1.19
		Diagonal	Max Tension	24	7.47	0.00	0.00
			Max. Compression	24	-7.56	0.00	0.00
			Max. Mx	31	0.62	0.30	0.03
			Max. My	29	-2.29	0.27	-0.04
			Max. Vy	29	0.13	0.30	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	29	-0.01	0.00	0.00
T11	10 - 0	Leg	Max Tension	7	143.87	0.15	-0.01
			Max. Compression	10	-170.72	0.00	-0.00
			Max. Mx	10	-170.56	1.47	-0.00
			Max. My	4	-13.11	-0.15	-1.19
			Max. Vy	10	-0.41	1.47	-0.00
			Max. Vx	4	-0.28	-0.15	-1.19
		Diagonal	Max Tension	25	7.45	0.11	0.01
			Max. Compression	24	-7.97	0.00	0.00
			Max. Mx	30	1.59	0.22	-0.04
			Max. My	31	2.06	0.22	0.04
			Max. Vy	30	0.12	0.21	0.04
			Max. Vx	31	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	10	2.96	0.04	-0.00
			Max. Compression	10	-2.96	0.00	0.00
			Max. Mx	28	0.91	0.14	0.01
			Max. My	30	-0.14	0.13	0.01
			Max. Vy	28	0.08	0.14	0.01
			Max. Vx	30	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	174.35	18.10	-10.30
	Max. H_x	18	174.35	18.10	-10.30
	Max. H_z	7	-149.61	-15.85	9.01
	Min. Vert	7	-149.61	-15.85	9.01
	Min. H_x	7	-149.61	-15.85	9.01
	Min. H_z	18	174.35	18.10	-10.30
Leg B	Max. Vert	10	177.59	-18.02	-10.59
	Max. H_x	23	-147.58	15.71	9.20
	Max. H_z	25	-128.51	13.09	9.29
	Min. Vert	23	-147.58	15.71	9.20
	Min. H_x	10	177.59	-18.02	-10.59
	Min. H_z	10	177.59	-18.02	-10.59
Leg A	Max. Vert	2	176.77	0.31	20.85
	Max. H_x	20	13.21	2.64	0.99
	Max. H_z	2	176.77	0.31	20.85
	Min. Vert	15	-147.66	-0.24	-18.20
	Min. H_x	9	9.75	-2.58	0.72
	Min. H_z	15	-147.66	-0.24	-18.20

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	31.08	-0.00	0.00	-9.67	-23.09	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	37.29	-0.01	-33.79	-2671.56	-26.54	9.33

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
0.9 Dead+1.6 Wind 0 deg - No Ice	27.97	-0.01	-33.78	-2665.14	-19.57	9.30
1.2 Dead+1.6 Wind 30 deg - No Ice	37.29	16.45	-28.44	-2263.40	-1330.10	7.21
0.9 Dead+1.6 Wind 30 deg - No Ice	27.97	16.44	-28.43	-2257.49	-1321.33	7.19
1.2 Dead+1.6 Wind 60 deg - No Ice	37.29	27.95	-16.09	-1290.85	-2250.81	4.03
0.9 Dead+1.6 Wind 60 deg - No Ice	27.97	27.94	-16.09	-1286.17	-2240.78	4.03
1.2 Dead+1.6 Wind 90 deg - No Ice	37.29	32.92	0.01	-9.86	-2635.55	-0.01
0.9 Dead+1.6 Wind 90 deg - No Ice	27.97	32.91	0.01	-6.87	-2625.08	0.01
1.2 Dead+1.6 Wind 120 deg - No Ice	37.29	29.33	16.91	1320.17	-2337.92	-4.56
0.9 Dead+1.6 Wind 120 deg - No Ice	27.97	29.33	16.91	1321.35	-2327.92	-4.53
1.2 Dead+1.6 Wind 150 deg - No Ice	37.29	16.47	28.48	2243.59	-1333.32	-7.55
0.9 Dead+1.6 Wind 150 deg - No Ice	27.97	16.47	28.47	2243.45	-1324.65	-7.52
1.2 Dead+1.6 Wind 180 deg - No Ice	37.29	0.01	32.25	2552.53	-29.11	-8.38
0.9 Dead+1.6 Wind 180 deg - No Ice	27.97	0.01	32.25	2551.94	-22.13	-8.35
1.2 Dead+1.6 Wind 210 deg - No Ice	37.29	-16.45	28.46	2241.70	1274.56	-7.04
0.9 Dead+1.6 Wind 210 deg - No Ice	27.97	-16.45	28.46	2241.58	1279.85	-7.02
1.2 Dead+1.6 Wind 240 deg - No Ice	37.29	-29.29	16.89	1317.44	2278.68	-4.16
0.9 Dead+1.6 Wind 240 deg - No Ice	27.97	-29.28	16.89	1318.63	2282.63	-4.16
1.2 Dead+1.6 Wind 270 deg - No Ice	37.29	-32.90	0.00	-12.60	2578.52	0.16
0.9 Dead+1.6 Wind 270 deg - No Ice	27.97	-32.89	0.00	-9.60	2582.01	0.14
1.2 Dead+1.6 Wind 300 deg - No Ice	37.29	-27.96	-16.12	-1294.09	2196.78	4.21
0.9 Dead+1.6 Wind 300 deg - No Ice	27.97	-27.95	-16.12	-1289.41	2200.70	4.18
1.2 Dead+1.6 Wind 330 deg - No Ice	37.29	-16.46	-28.47	-2266.12	1277.17	7.66
0.9 Dead+1.6 Wind 330 deg - No Ice	27.97	-16.46	-28.46	-2260.20	1282.33	7.63
1.2 Dead+1.0 Ice+1.0 Temp	139.25	-0.00	0.00	-41.35	-132.40	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	139.25	-0.01	-7.78	-655.15	-131.77	2.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	139.25	3.83	-6.63	-565.98	-435.01	1.38
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	139.25	6.62	-3.81	-343.22	-656.50	0.38
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	139.25	7.67	0.01	-40.44	-739.11	-0.68
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	139.25	6.75	3.90	266.28	-664.83	-1.62
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	139.25	3.84	6.64	483.97	-436.58	-2.10
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	139.25	0.01	7.65	563.81	-133.61	-2.00

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
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	139.25	-3.83	6.63	482.93	169.49	-1.35
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	139.25	-6.73	3.88	264.40	397.84	-0.36
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	139.25	-7.66	-0.01	-42.35	473.17	0.70
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	139.25	-6.63	-3.83	-344.81	391.82	1.58
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	139.25	-3.84	-6.64	-566.79	171.18	2.11
Dead+Wind 0 deg - Service	31.08	-0.00	-8.25	-658.40	-22.84	2.27
Dead+Wind 30 deg - Service	31.08	4.01	-6.94	-558.86	-340.76	1.76
Dead+Wind 60 deg - Service	31.08	6.82	-3.93	-321.67	-565.30	0.98
Dead+Wind 90 deg - Service	31.08	8.03	0.00	-9.26	-659.13	0.00
Dead+Wind 120 deg - Service	31.08	7.16	4.13	315.11	-586.55	-1.11
Dead+Wind 150 deg - Service	31.08	4.02	6.95	540.31	-341.54	-1.84
Dead+Wind 180 deg - Service	31.08	0.00	7.87	615.66	-23.46	-2.04
Dead+Wind 210 deg - Service	31.08	-4.01	6.95	539.85	294.48	-1.71
Dead+Wind 240 deg - Service	31.08	-7.15	4.12	314.44	539.36	-1.02
Dead+Wind 270 deg - Service	31.08	-8.03	0.00	-9.93	612.49	0.03
Dead+Wind 300 deg - Service	31.08	-6.82	-3.93	-322.46	519.39	1.02
Dead+Wind 330 deg - Service	31.08	-4.02	-6.95	-559.52	295.11	1.87

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	0.00	-31.08	0.00	0.00	31.08	-0.00	0.000%
2	-0.00	-37.29	-33.79	0.01	37.29	33.79	0.010%
3	-0.00	-27.97	-33.79	0.01	27.97	33.78	0.027%
4	16.45	-37.29	-28.44	-16.45	37.29	28.44	0.010%
5	16.45	-27.97	-28.44	-16.44	27.97	28.43	0.029%
6	27.96	-37.29	-16.10	-27.95	37.29	16.09	0.011%
7	27.96	-27.97	-16.10	-27.94	27.97	16.09	0.031%
8	32.93	-37.29	0.01	-32.92	37.29	-0.01	0.010%
9	32.93	-27.97	0.01	-32.91	27.97	-0.01	0.029%
10	29.34	-37.29	16.91	-29.33	37.29	-16.91	0.010%
11	29.34	-27.97	16.91	-29.33	27.97	-16.91	0.027%
12	16.47	-37.29	28.48	-16.47	37.29	-28.48	0.010%
13	16.47	-27.97	28.48	-16.47	27.97	-28.47	0.029%
14	0.01	-37.29	32.26	-0.01	37.29	-32.25	0.011%
15	0.01	-27.97	32.26	-0.01	27.97	-32.25	0.031%
16	-16.45	-37.29	28.47	16.45	37.29	-28.46	0.010%
17	-16.45	-27.97	28.47	16.45	27.97	-28.46	0.029%
18	-29.29	-37.29	16.90	29.29	37.29	-16.89	0.009%
19	-29.29	-27.97	16.90	29.28	27.97	-16.89	0.026%
20	-32.90	-37.29	-0.00	32.90	37.29	-0.00	0.010%
21	-32.90	-27.97	-0.00	32.89	27.97	-0.00	0.029%
22	-27.97	-37.29	-16.12	27.96	37.29	16.12	0.011%
23	-27.97	-27.97	-16.12	27.95	27.97	16.12	0.031%
24	-16.47	-37.29	-28.47	16.46	37.29	28.47	0.010%
25	-16.47	-27.97	-28.47	16.46	27.97	28.46	0.029%
26	0.00	-139.25	0.00	0.00	139.25	-0.00	0.003%
27	-0.01	-139.25	-7.79	0.01	139.25	7.78	0.001%
28	3.83	-139.25	-6.63	-3.83	139.25	6.63	0.001%
29	6.62	-139.25	-3.82	-6.62	139.25	3.81	0.001%
30	7.67	-139.25	0.01	-7.67	139.25	-0.01	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
31	6.75	-139.25	3.90	-6.75	139.25	-3.90	0.001%
32	3.84	-139.25	6.65	-3.84	139.25	-6.64	0.003%
33	0.01	-139.25	7.65	-0.01	139.25	-7.65	0.003%
34	-3.83	-139.25	6.64	3.83	139.25	-6.63	0.003%
35	-6.74	-139.25	3.89	6.73	139.25	-3.88	0.002%
36	-7.67	-139.25	-0.01	7.66	139.25	0.01	0.003%
37	-6.63	-139.25	-3.83	6.63	139.25	3.83	0.003%
38	-3.84	-139.25	-6.65	3.84	139.25	6.64	0.003%
39	-0.00	-31.08	-8.25	0.00	31.08	8.25	0.011%
40	4.02	-31.08	-6.94	-4.01	31.08	6.94	0.011%
41	6.83	-31.08	-3.93	-6.82	31.08	3.93	0.011%
42	8.04	-31.08	0.00	-8.03	31.08	-0.00	0.011%
43	7.16	-31.08	4.13	-7.16	31.08	-4.13	0.011%
44	4.02	-31.08	6.95	-4.02	31.08	-6.95	0.010%
45	0.00	-31.08	7.88	-0.00	31.08	-7.87	0.010%
46	-4.02	-31.08	6.95	4.01	31.08	-6.95	0.010%
47	-7.15	-31.08	4.13	7.15	31.08	-4.12	0.010%
48	-8.03	-31.08	-0.00	8.03	31.08	-0.00	0.010%
49	-6.83	-31.08	-3.94	6.82	31.08	3.93	0.010%
50	-4.02	-31.08	-6.95	4.02	31.08	6.95	0.011%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00002266
2	Yes	7	0.00000001	0.00049997
3	Yes	6	0.00038479	0.00079473
4	Yes	7	0.00018533	0.00053312
5	Yes	6	0.00042005	0.00086595
6	Yes	7	0.00019601	0.00056274
7	Yes	6	0.00045103	0.00092885
8	Yes	7	0.00018524	0.00053262
9	Yes	6	0.00041985	0.00086525
10	Yes	7	0.00000001	0.00049927
11	Yes	6	0.00038454	0.00079375
12	Yes	7	0.00000001	0.00053126
13	Yes	6	0.00041874	0.00086321
14	Yes	7	0.00019582	0.00056230
15	Yes	6	0.00045069	0.00092840
16	Yes	7	0.00000001	0.00053252
17	Yes	6	0.00041962	0.00086521
18	Yes	7	0.00000001	0.00049948
19	Yes	6	0.00038449	0.00079414
20	Yes	7	0.00000001	0.00053300
21	Yes	6	0.00042000	0.00086595
22	Yes	7	0.00019589	0.00056300
23	Yes	6	0.00045084	0.00092931
24	Yes	7	0.00000001	0.00053220
25	Yes	6	0.00041914	0.00086460
26	Yes	6	0.00000001	0.00052527
27	Yes	8	0.00000001	0.00035262
28	Yes	8	0.00000001	0.00036988
29	Yes	8	0.00000001	0.00037769
30	Yes	8	0.00000001	0.00037197
31	Yes	8	0.00000001	0.00035672

32	Yes	7	0.00000001	0.00095903
33	Yes	7	0.00000001	0.00086735
34	Yes	7	0.00000001	0.00077746
35	Yes	7	0.00000001	0.00074017
36	Yes	7	0.00000001	0.00076462
37	Yes	7	0.00000001	0.00084920
38	Yes	7	0.00000001	0.00094221
39	Yes	6	0.00000001	0.00088061
40	Yes	6	0.00000001	0.00089587
41	Yes	6	0.00000001	0.00090910
42	Yes	6	0.00000001	0.00089433
43	Yes	6	0.00000001	0.00087779
44	Yes	6	0.00000001	0.00088720
45	Yes	6	0.00000001	0.00089930
46	Yes	6	0.00000001	0.00088472
47	Yes	6	0.00000001	0.00087119
48	Yes	6	0.00000001	0.00088700
49	Yes	6	0.00000001	0.00090287
50	Yes	6	0.00000001	0.00089092

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	132	Diagonal	A325N	0.63	1	1.16	6.10	0.190 ✔	1	Member Block Shear
		Top Girt	A325N	0.63	1	0.08	6.83	0.011 ✔	1	Member Block Shear
T2	124	Leg	A325N	0.63	4	0.80	20.71	0.039 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.00	6.10	0.164 ✔	1	Member Block Shear
T3	120	Leg	A325N	0.75	4	4.84	29.82	0.162 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	3.81	7.12	0.535 ✔	1	Member Block Shear
T4	100	Diagonal	A325N	0.63	1	4.52	8.48	0.533 ✔	1	Member Bearing
T5	93.3333	Diagonal	A325N	0.63	1	4.61	8.48	0.543 ✔	1	Member Bearing
T6	86.6667	Leg	A325N	0.88	4	10.99	40.59	0.271 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.55	8.48	0.654 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	0.96	4.79	0.201 ✔	1	Member Block Shear
T7	80	Leg	A325N	0.88	4	18.03	40.59	0.444 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.78	8.48	0.681 ✔	1	Member Bearing
T8	60	Leg	A325N	1.00	4	24.58	53.01	0.464 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	6.33	9.51	0.665 ✔	1	Member Bearing
T9	40	Leg	A325N	1.00	4	30.22	53.01	0.570 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	7.47	12.43	0.601 ✔	1	Bolt Shear
T10	20	Diagonal	A325N	0.75	1	7.47	12.19	0.613 ✔	1	Member Bearing
T11	10	Diagonal	A325N	0.75	1	7.45	12.19	0.611 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	2.96	7.83	0.378 ✔	1	Member Bearing

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

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0 K=1.00	1.07	-3.48	36.84	0.094 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0 K=1.00	1.07	-4.75	36.84	0.129 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4 K=1.00	1.70	-27.20	57.13	0.476 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-35.95	70.89	0.507 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-45.45	70.89	0.641 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5 K=1.00	2.23	-55.47	91.43	0.607 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5 K=1.00	5.47	-87.17	160.27	0.544 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3 K=1.00	4.41	-117.25	159.91	0.733 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4 K=1.00	6.11	-143.70	201.25	0.714 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4 K=1.00	6.11	-158.06	201.25	0.785 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6 K=1.00	6.11	-170.72	253.28	0.674 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	126.9 K=1.00	0.62	-1.12	8.62	0.130 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	127.1 K=1.00	0.62	-1.03	8.59	0.120 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	145.8	0.71	-3.86	7.60	0.508 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	133.6 K=1.00	0.90	-4.56	11.42	0.399 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	140.1 K=1.00	0.90	-4.63	10.38	0.446 [1] ✔
T6	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	149.9 K=1.00	0.90	-5.75	9.07	0.634 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	168.5 K=1.00	0.90	-5.81	7.17	0.809 [1] ✔
T8	60 - 40	L3x3x3/16	15.90	7.80	157.1 K=1.00	1.09	-6.44	9.97	0.645 [1] ✔
T9	40 - 20	L3x3x1/4	19.10	9.45	191.5 K=1.00	1.44	-7.47	8.87	0.841 [1] ✔
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	170.6 K=1.00	1.69	-7.56	13.12	0.576 [1] ✔
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	180.4 K=1.00	1.69	-7.97	11.73	0.680 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	10.05	132.1 K=0.50	0.53	-0.96	6.82	0.141 [1] ✔
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	17.79	137.2 K=0.50	0.90	-2.96	10.82	0.274 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L2x2x3/16	6.60	6.17	187.8 K=1.00	0.71	-0.07	4.58	0.015 [1] ✔
T3	120 - 100	L2x2x3/16	6.65	6.45	167.0 K=0.85	0.71	-0.15	5.79	0.026 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0	1.07	1.32	48.35	0.027 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0	1.07	3.22	48.35	0.067 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4	1.70	19.37	76.68	0.253 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9	2.23	27.09	100.28	0.270 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9	2.23	35.76	100.28	0.357 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5	2.23	44.34	100.28	0.442 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5	5.47	72.12	245.99	0.293 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3	4.41	98.33	198.34	0.496 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4	6.11	120.90	275.04	0.440 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4	6.11	132.95	275.04	0.483 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6	6.11	143.87	275.04	0.523 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	84.0	0.36	1.16	15.68	0.074 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	84.1	0.36	1.00	15.68	0.064 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	95.5	0.43	3.81	18.74	0.203 [1] ✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	86.9	0.57	4.52	24.84	0.182 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	91.1	0.57	4.61	24.84	0.185 [1] ✔
T6	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	95.4	0.57	5.55	24.84	0.223 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	109.2	0.57	5.78	24.84	0.233 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	L3x3x3/16	15.90	7.80	101.3	0.71	6.33	34.71	0.182 [1]
T9	40 - 20	L3x3x1/4	19.10	9.45	123.5	0.94	7.26	45.79	0.159 [1]
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	110.1	1.10	7.47	53.79	0.139 [1]
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	114.9	1.10	7.45	53.79	0.138 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	10.05	264.1	0.29	0.96	12.62	0.076 [1]
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	17.79	274.5	0.57	2.96	24.84	0.119 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	L2x2x3/16	6.60	6.17	124.6	0.43	0.08	18.74	0.004 [1]
T3	120 - 100	L2x2x3/16	6.65	6.45	125.4	0.71	0.24	23.17	0.010 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

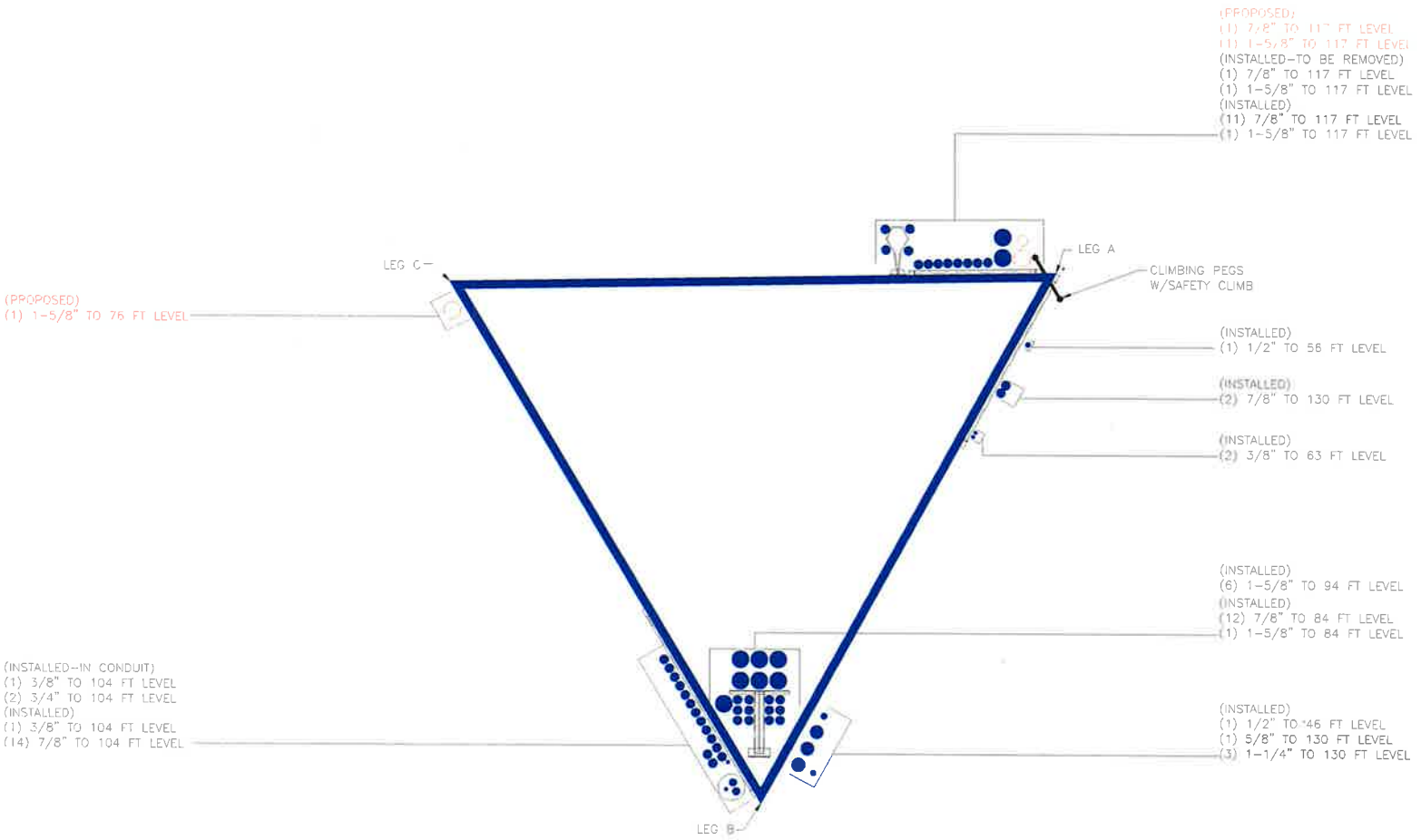
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.48	36.84	9.4	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.75	36.84	12.9	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-27.20	57.13	47.6	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-35.95	70.89	50.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	69	-45.45	70.89	64.1	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	78	-55.47	91.43	60.7	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-87.17	160.27	54.4	Pass
T8	60 - 40	Leg	ROHN 4 X-STR	110	-117.25	159.91	73.3	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-143.70	201.25	71.4	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-158.06	201.25	78.5	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-170.72	253.28	67.4	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.12	8.62	13.0 19.0 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.03	8.59	12.0 16.4 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	34	-3.86	7.60	50.8 53.5 (b)	Pass
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	61	-4.56	11.42	39.9 53.3 (b)	Pass
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	70	-4.63	10.38	44.6 54.3 (b)	Pass
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-5.75	9.07	63.4 65.4 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-5.81	7.17	80.9	Pass
T8	60 - 40	Diagonal	L3x3x3/16	115	-6.44	9.97	64.5 66.5 (b)	Pass
T9	40 - 20	Diagonal	L3x3x1/4	136	-7.47	8.87	84.1	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-7.56	13.12	57.6 61.3 (b)	Pass
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	160	-7.97	11.73	68.0	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	86	-0.96	6.82	14.1 20.1 (b)	Pass
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	164	-2.96	10.82	27.4 37.8 (b)	Pass
T1	132 - 124	Top Girt	L2x2x3/16	6	-0.07	4.58	1.5	Pass
T3	120 - 100	Top Girt	L2x2x3/16	32	-0.15	5.79	2.6	Pass

Summary	ELC:	LC7
Leg (T10)	78.5	Pass
Diagonal (T9)	84.1	Pass
Secondary Horizontal (T11)	37.8	Pass
Top Girt (T3)	2.6	Pass
Bolt Checks	68.1	Pass
Rating =	84.1	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806377 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

CROWN CASTLE

Site Data	
BU#:	806377
Site Name:	HRT 084 943242
App #:	393823 Rev. 1

Reactions		
Eta Factor, η	0.55	Detail Type
Uplift, Pu:	150	kips
Shear, Vu:	18	kips

Anchor Rod Data		
Qty:	4	
Diam:	1	in
Rod Material:	A449 (1/4 to 1 Incl.)	
Strength (Fu):	120	ksi
Yield (Fy):	92	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ń):	45.7	Kips
Design Axial, Φ*Fu*Anet:	58.2	Kips
Anchor Rod Stress Ratio:	78.5%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

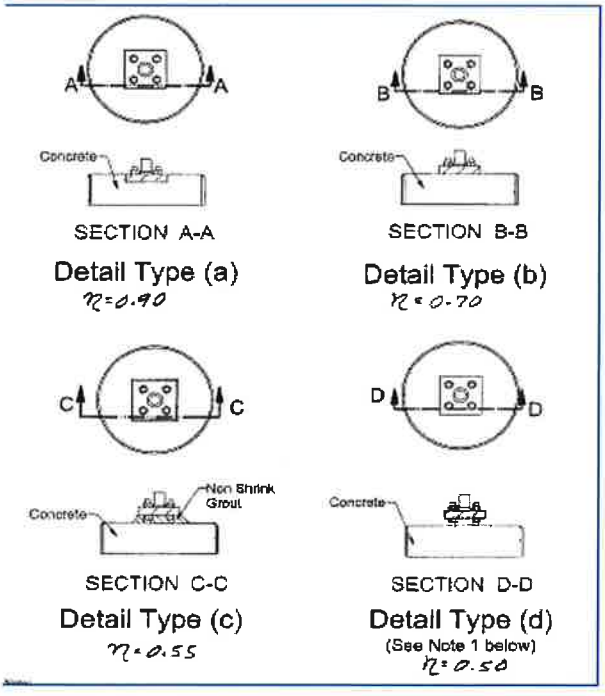


Figure 4-4 of TIA-222-G

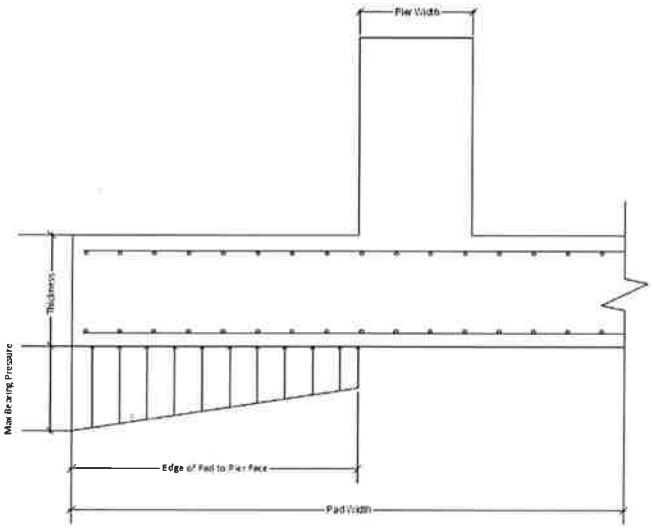
Maximum Acceptable Ratio:	105	%
Governing Stress Ratio:	78.5%	**Pass**

Monopole or Self Support Pad Foundation Reinforcing
BU#: 806377
SSOE Project Number: 017-00651-00

Analysis Code	G
Compression	178 k
Uplift	150 k
Shear	18 k

Structural Capacity	20.4%	OK

Pad Geometry & Reinforcing	
Pad Length	24 ft
Pad Width	24 ft
Pad Thickness	4.2 ft
Pad Top Rebar Size	# 8
Pad Top Rebar Quantity	24
Pad Bottom Rebar Size	# 8
Pad Bottom Rebar Quantity	24
Clear Cover	3 in
f_c'	3 ksi
Rebar Fy	60 ksi
Minimum Steel Assumed?	NO
Pier Shape	Square
Pier Rebar Size	# 9
Pier Rebar Quantity	16
Pier Width	3.3 ft
Pier Height	2.3 ft
Anchor Rod Circle	9.5 in
Anchor Rod Embedment	66.5 in
Pier Tie Size	# 5



Bearing Calculation		
Max Bearing Pressure	1.73	ksf
Edge of Pad to Pier Face	2.20833	ft
Clear Distance Between Piers	15.5	ft
ecc3 (From Crown Spreadsheet)	7.69	
Non-Bearing Length	15.38	ft

Structural Calculations		
Minimum Reinforcement Check		
Pad - A_s Min Met?	Yes	
Pier - A_s Min Met?	Yes	
Punching Shear		
φ (Shear) =	0.75	
V_u =	128.92 k	
ϕV_c =	2622.76 k	
Shear Capacity	4.9%	OK
Pad Flexure		
φ (Tension) =	0.9	
M_u	3.86 k-ft	
ϕM_n =	162.20 k-ft	
Moment Capacity	2.4%	OK
Beam Shear		
V_u	3.33 k	
ϕV_n =	45.75 k	
Shear Capacity	7.3%	OK
Pier Compression		
P_u	178 k	
ϕP_n =	3401.29 k	
Compression Capacity	5.2%	OK
Pier Tension		
P_u =	150.00 k	
ϕP_n =	736.13 k	
Tension Capacity =	20.4%	OK
Pier Interface		
P_u =	827.21824 k	
ϕP_n =	7997.616 k	
Interface Capacity =	10.3%	OK

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

Site Data

BU#: *806377*
Site Name: *HRT 084 943242*
App #: *393823 Rev. 1*

Loads Already Factored		
For P (DL)	1.2	<----Disregard
For P,V, and M (WL)	1.35	<----Disregard

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	27.6	in
Pad Bearing Depth, D:	4.2	ft
Pad Thickness, T:	4.2	ft
Pad Width=Length, L:	24	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	3.3	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	10.89	ft^2
Pier Height:	2.30	ft
Soil (above pad) Height:	0.00	ft

Soil Parameters		
Unit Weight, γ:	115.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	33.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	3.39	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	34.0	kips
Pad Force Location Above D:	1.40	ft
ϕ(Passive Pressure Moment):	47.60	ft-kips
Factored O.T. M(WL), "1.6W":	2914.5	ft-kips
Factored OT (MW-Msoil), M1	2866.90	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	366.6	kips
Unfactored (Total ftg-soil Wt):	366.64	kips
1.2D. **No Soil Wedges**.	476.96	kips
0.9D. **With Soil Wedges**	357.72	kips

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

Monopole Base Reaction Forces		
TIA Revision:	G	<--Pull Down
Factored DL Axial, PDu:	37	kips
Factored WL Axial, PWu:	0	kips
Factored WL Shear, Vu:	34	kips
Factored WL Moment, Mu:	2685	ft-kips

Load Factor	Shaft Factored Loads		
1.00	1.2D+1.6W, Pu:	37	kips
0.90	0.9D+1.6W, Pu:	27.75	kips
1.00	Vu:	34	kips
	Mu:	2685	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	476.96	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	2866.90	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	6.01	ft
Orthogonal qu=	1.66	ksf
qu/ϕ*qn Ratio=	**7.37%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	4.25	ft
Diagonal qu=	1.99	ksf
qu/ϕ*qn Ratio=	**8.82%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

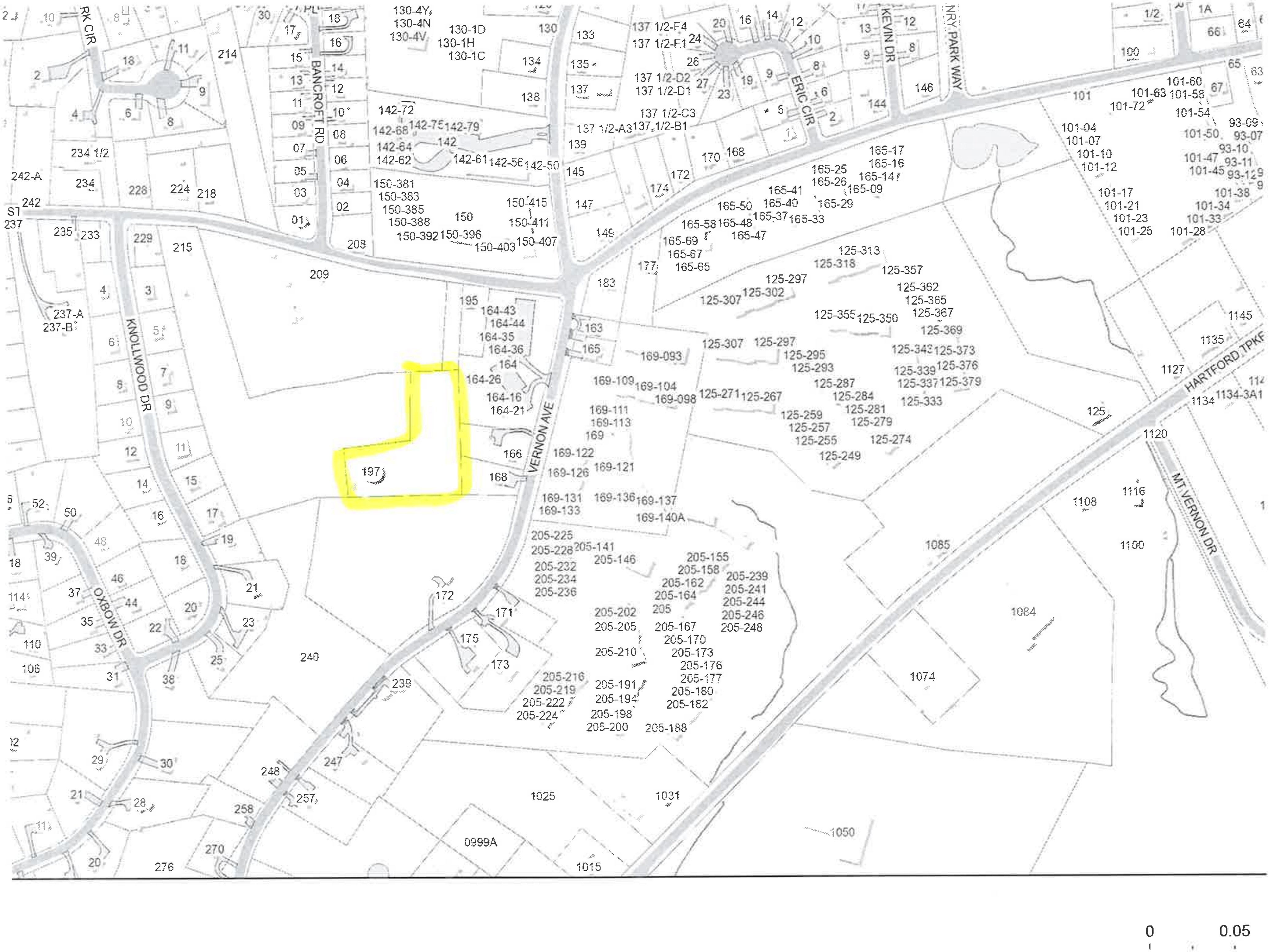
0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	357.72	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	2866.90	ft-kips

Orthogonal ecc3 = M2/P2 =	8.01	ft
Ortho Non Bearing Length,NBL=	16.03	ft
Orthogonal qu=	1.87	ksf
Diagonal qu=	2.23	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2685.00		
M Orthogonal:	3992.29	**67.25%**	**Pass**
M Diagonal:	3992.29	**67.25%**	**Pass**

ATTACHMENT 4



VERNON AVE
KNOLLWOOD DR
OXBOW DR
BANCROFT RD
ERIC CIR
KEVIN DR
NRY PARK WAY
HARTFORD TPKE
MT VERNON DR
RK CIR
197
0
0.05

CONNECTICUT WATER CO
93 WEST MAIN ST
CLINTON, CT 06413-1600
CENSUS TRACT: 530400

Neighborhood Number
11900
Neighborhood Name
General Commercial A
TAXING DISTRICT INFORMATION

Jurisdiction Name	Town of Vernon
Area	146
Routing Number	5887

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Book/Page	Deed Type
NA	0	12/21/1978	351 39	

Site Description

Topography

Public Utilities
Water, Sewer, Gas, Electric
Street or Road
Paved
Neighborhood

Zoning:
R-22
Legal Acres:
2.0000

Valuation Record

Assessment Year		2011	2016
Reason for Change		2011 REVAL	2016 Reval
Market	L	156820	183200
	I	270220	263240
	T	427040	446440
70% Assessed/Use	L	109770	128240
	I	189160	184270
	T	298930	312510

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor

Tax ID 39-065B-0016A Printed 03/04/2017

Physical Characteristics

ROOFING

Other

WALLS

	B	1	2	U
Frame		Yes		
Guard	Yes	Yes	Yes	Yes

FRAMING

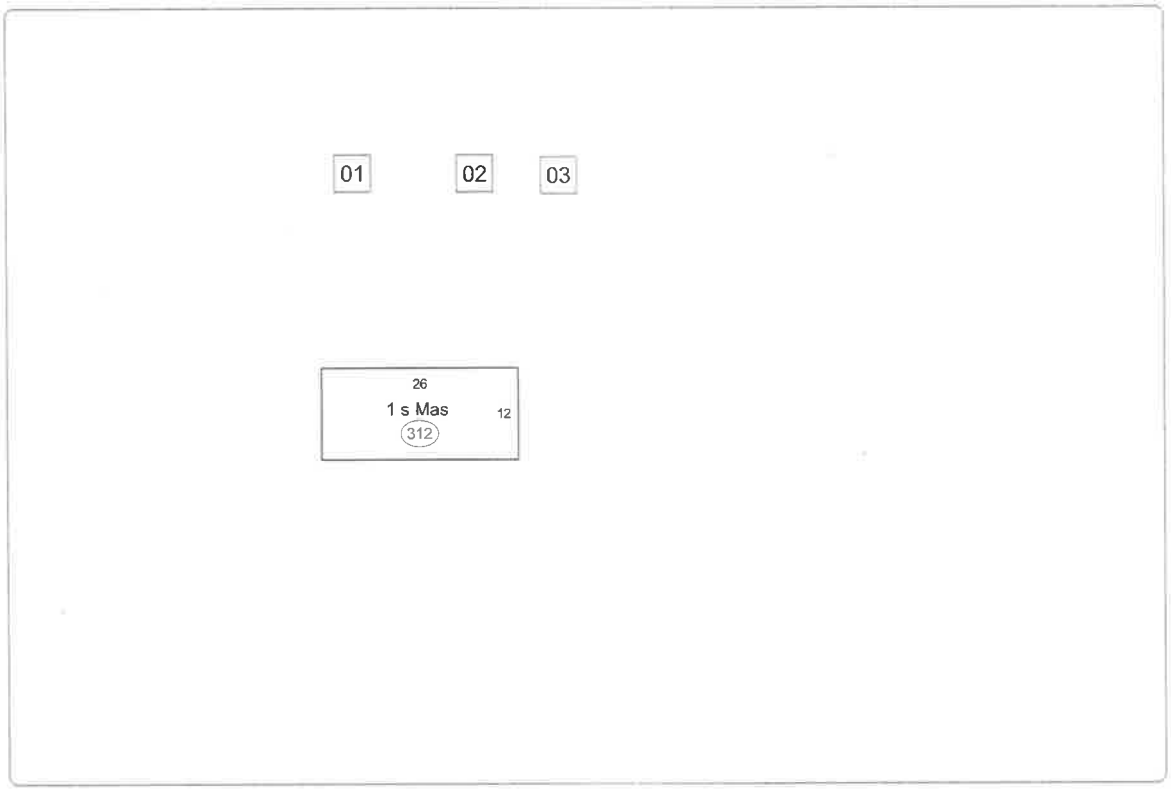
	B	1	2	U
F Res	0	312	0	0

FINISH

	UF	SF	FO	FD
1	312	0	0	0
Total	312	0	0	0

HEATING AND AIR CONDITIONING

	B	1	2	U



Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
C	UTLSTOR	0.00		Avg	1963	1995	AV	312
01	FENCECL	6.00	51C	Avg	1963	1985	AV	510
02	UTLSHED	0.00	4	Avg	1963	1985	AV	300
03	TANKWATR	0.00	51	Good	1963	2000	AV	125000

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here ***Postmark with Date of Receipt.***
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3	3	neopost 11/09/2017 US POSTAGE $002.38 ZIP 06103 041L12203380
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Daniel A. Champagne, Mayor Town of Vernon 14 Park Place Vernon, CT 06066				
2.	Marina Rodriguez, Town Planner Town of Vernon 14 Park Place Vernon, CT 06066				
3.	Connecticut Water Company 93 West Main Street Clinton, CT 06413				
4.					
5.					
6.					

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