
November 10, 2016

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

Re: **Notice of Exempt Modification – Facility Modification
123 Costello Road, Newington, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 114-foot level of the existing 145-foot tower at 123 Costello Road in Newington, Connecticut (the “Property”). The tower is owned by Crown Castle (“Crown”). The Council approved Cellco’s use of this tower in 2003. Cellco now intends to modify its facility by replacing nine (9) of its antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads (“RRHs”) and install six (6) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being sent to Newington’s Mayor, Roy Zartarian. A copy of this letter is also being sent to Costello Industries, Inc., 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).

15680346-v1

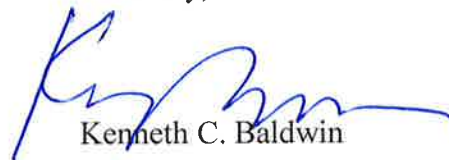
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1. The proposed modifications will not result in an increase in the height of the existing structure. Cellco's new antennas and RRHs will be installed at a centerline height of 114 feet on the 145-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support Cellco's proposed modifications. (*See Structural Analysis Report included in Attachment 3*).

A copy of the Town Assessor's Parcel Map and property owner information is included in Attachment 4.

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:

Roy Zartarian, Newington Mayor
Costello Industries, Inc.
Crown Castle
Tim Parks

ATTACHMENT 1



SBNHH-1D65B

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

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

Electrical Specifications

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

Electrical Specifications, BASTA*

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

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

General Specifications

Antenna Type	Sector with internal RET
Band	Multiband
Brand	DualPol®
Operating Frequency Band	1695 – 2360 MHz 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground

SBNHH-1D65B

Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Depth	180.0 mm 7.1 in
Length	1851.0 mm 72.9 in
Width	301.0 mm 11.9 in
Net Weight, without mounting kit	18.4 kg 40.6 lb

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

Depth	296.0 mm 11.7 in
Length	2025.0 mm 79.7 in
Width	390.0 mm 15.4 in
Shipping Weight	31.0 kg 68.3 lb

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



SBNHH-1D65B

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

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

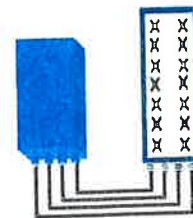


FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R
Can be switched between
modes via SW w/o site
visit

TECHNICAL SPECIFICATIONS

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

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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.

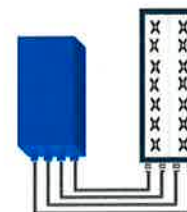


FEATURES

- 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

TECHNICAL SPECIFICATIONS

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

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B25 RRH4x30

ALCATEL-LUCENT DATA SHEET REV1.1 – JANUARY 2015

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.

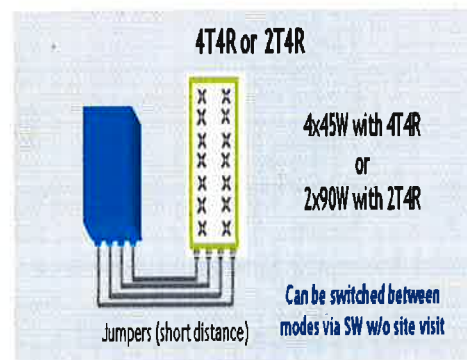
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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



TECHNICAL SPECIFICATIONS

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
Size (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@ 150km/h or 93mph)	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

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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.

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

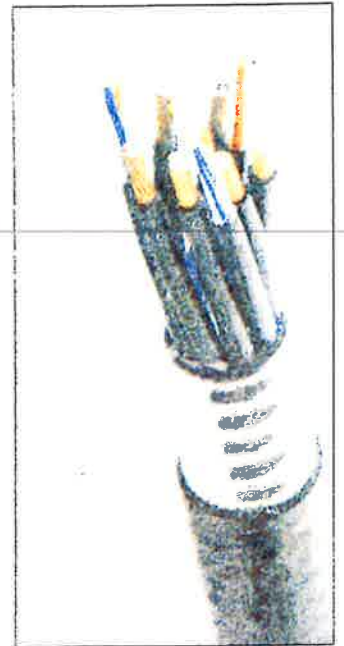


Figure 1: HYBRIFLEX Series

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)]	0.68 (0.205)
DC-Resistance Power Cable, 8 4mm ² (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)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (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), IEEE 1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

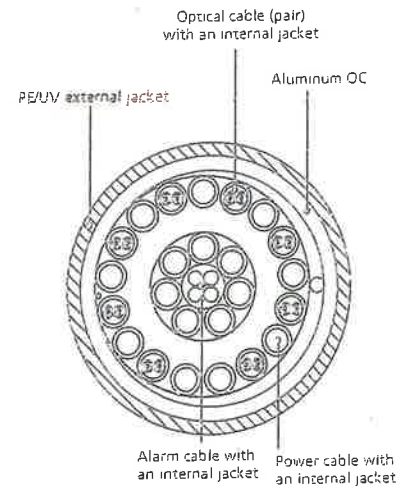


Figure 2: Construction Detail

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

ATTACHMENT 2

ATTACHMENT 3



Date: September 14, 2016

Sean Dempsey
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6565

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jmeinerding@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Number: 119665
Carrier Site Name: Newington 2 CT

Crown Castle Designation:
Crown Castle BU Number: 881364
Crown Castle Site Name: Newington
Crown Castle JDE Job Number: 345509
Crown Castle Work Order Number: 1294992
Crown Castle Application Number: 309400 Rev. 13

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37516-0225.003.7805
(Revision)

Site Data: 123 Costelo Road, Newington, Hartford County, CT
Latitude 41° 39' 18.72", Longitude -72° 43' 17.19"
145 Foot - Monopole Tower

Dear Sean Dempsey,

Paul J. Ford and Company 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 944722, in accordance with application 309400, revision 13.

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:

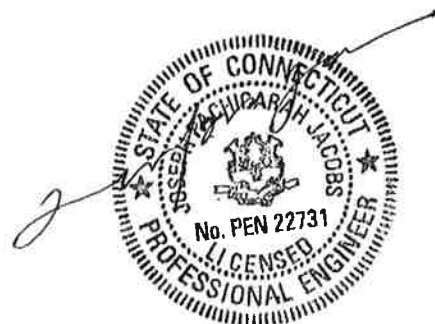
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2012 International Building Code based upon an ultimate 3-second gust wind speed of 123 mph converted to a nominal 3-second gust wind speed of 95 mph per section 1609.3.1 as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II and Exposure Category C were used in this analysis.

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

Respectfully submitted by:


Joey Meinerding, E.I.
Structural Designer 



SEP 14 2016

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1) INTRODUCTION

This tower is a 145 ft. monopole tower designed by Summit in August of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2012 International Building Code based upon an ultimate 3-second gust wind speed of 123 mph converted to a nominal 3-second gust wind speed of 95 mph per section 1609.3.1 as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II and Exposure Category C were used in this analysis.

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
114.0	114.0	3	alcatel lucent	B25 RRH4X30	1	1-5/8	--
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH4X45-AWS4 B66			
		9	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
133.0	139.0	2	andrew	VHLP2.5-11	6 2	5/16 1/2	1
		2	dragonwave	HORIZON COMPACT			
		2	samsung telecom	WIMAX DAP HEAD			
	135.0	3	argus technologies	LLPX310R-V1 w/ Mount Pipe			
		1	motorola	TIMING 2000			
		1	samsung telecom	WIMAX DAP HEAD			
	133.0	1	tower mounts	Platform Mount [LP 712-1]			
124.0	124.0	3	alcatel lucent	TD-RRH8x20-25	4	1-1/4	1
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
		1	tower mounts	Platform Mount [LP 712-1]			
122.0	122.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	--	--	1
		1	tower mounts	Pipe Mount [PM 601-3]			
	118.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
114.0	116.0	1	lucent	KS24019-L112A	1 7	1/2 1-5/8	1
	114.0	3	antel	BXA-80063/4CFx5 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Platform Mount [LP 712-1]			
		1	kathrein	800 10735 K w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
114.0	114.0	2	andrew	LNX-6514DS-T4M w/ Mount Pipe	1 6	1-1/4 1-5/8	3
		3	antel	BXA-171063/8CF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-185063/8CF w/ Mount Pipe			
		3	alcatel lucent	RRH2x40-AWS			
105.0	105.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2	3/8 3/4	2
		3	ericsson	RRUS 32 B30			
		1	raycap	DC6-48-60-18-8F			
		6	ericsson	RRUS-11	1 2 12	3/8 3/4 1-5/8	1
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 712-1]			
94.0	95.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1	1-1/4	2
		3	commscope	LNX-6515DS-A1M w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	12	1-5/8	1
		3	ericsson	KRY 112 144/1			
	94.0	1	tower mounts	Platform Mount [LP 712-1]			
87.0	87.0	3	kathrein	742 213 w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
77.0	77.0	1	symmetricom	58532A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 08/10/1999	1425352	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 5153/29299-105, 08/11/1999	1425473	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 5153, 08/10/1999	1425417	CCISITES
4-POST-MODIFICATION INSPECTION	ETS, 160020, 02/29/2016	6120832	CCISITES

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) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) For existing modifications: monopole was modified in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	145 - 130	Pole	TP26.77x24x0.1875	1	-2.78	1052.41	4.7	Pass
L2	130 - 84.75	Pole	TP35.27x26.77x0.25	2	-19.05	1829.61	55.7	Pass
L3	84.75 - 58.0833	Pole	TP39.6977x33.9247x0.3125	3	-26.79	2713.34	77.1	Pass
L4	58.0833 - 44.25	Pole	TP42.26x39.6977x0.3959	4	-29.23	2783.89	84.8	Pass
L5	44.25 - 31.25	Pole	TP44.0424x40.4957x0.4537	5	-36.21	3338.55	88.0	Pass
L6	31.25 - 4.75	Pole	TP48.9503x44.0424x0.4996	6	-46.26	4246.55	85.8	Pass
L7	4.75 - 0	Pole	TP49.83x48.9503x0.5478	7	-48.29	4926.71	76.5	Pass
							Summary	
						Pole (L5)	88.0	Pass
						RATING =	88.0	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.0	Pass
1	Base Plate	0	73.9	Pass
1	Base Foundation Structural Steel	0	59.3	Pass
1	Base Foundation Soil Interaction	0	58.3	Pass
1	Flange Connection	130	7.0	Pass

Structure Rating (max from all components) =	88.0%
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Notes:

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

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- 3) Basic wind speed of 95.0 mph.
- 4) Structure Class II.
- 5) Exposure Category C.
- 6) Topographic Category 1.
- 7) Crest Height 0.0000 ft.
- 8) Nominal ice thickness of 1.0000 in.
- 9) Ice thickness is considered to increase with height.
- 10) Ice density of 56 pcf.
- 11) A wind speed of 50.0 mph is used in combination with ice.
- 12) Temperature drop of 50 °F.
- 13) Deflections calculated using a wind speed of 60.0 mph.
- 14) A non-linear (P-delta) analysis was used.
- 15) Pressures are calculated at each section.
- 16) Stress ratio used in pole design is 1.
- 17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	145.0000- 130.0000	15.0000	0.00	18	24.0000	26.7700	0.1875	0.7500	A607-65 (65 ksi)
L2	130.0000- 84.7500	45.2500	4.50	18	26.7700	35.2700	0.2500	1.0000	A607-65 (65 ksi)
L3	84.7500- 58.0833	31.1667	0.00	18	33.9247	39.6977	0.3125	1.2500	A607-65 (65 ksi)
L4	58.0833- 44.2500	13.8333	5.25	18	39.6977	42.2600	0.3959	1.5836	Reinf 47.40 ksi (47 ksi)
L5	44.2500-	18.2500	0.00	18	40.4957	44.0424	0.4537	1.8149	Reinf 46.53 ksi

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	31.2500 31.2500-4.7500	26.5000	0.00	18	44.0424	48.9503	0.4996	1.9983	(47 ksi) Reinf 48.36 ksi (48 ksi)
L7	4.7500-0.0000	4.7500		18	48.9503	49.8300	0.5478	2.1913	Reinf 50.30 ksi (50 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.3702 27.1830	14.1714 15.8199	1015.2211 1412.3200	8.4534 9.4368	12.1920 13.5992	83.2694 103.8535	2031.7780 2826.4984	7.0871 7.9115	3.8940 4.3815	20.768 23.368
L2	27.1830 35.8141	21.0436 27.7884	1869.8421 4305.5913	9.4146 12.4321	13.5992 17.9172	137.4969 240.3055	3742.1446 8616.8481	10.5238 13.8968	4.2715 5.7675	17.086 23.07
L3	35.2944 40.3101	33.3391 39.0652	4758.6659 7655.8350	11.9323 13.9817	17.2337 20.1664	276.1248 379.6329	9523.5933 15321.743	16.6727 19.5363	5.4207 6.4368	17.346 20.598
L4	40.3101 42.9119	49.3861 52.6059	9637.5402 11648.101	13.9521 14.8618	20.1664 21.4681	477.9005 542.5777	19287.761 23311.530	24.6977 26.3079	6.2900 6.7410	15.888 17.027
L5	42.1565 44.7219	57.6661 62.7738	11681.254 15068.288	14.2149 15.4740	20.5718 22.3736	567.8275 673.4864	23377.879 30156.403	28.8385 31.3929	6.3287 6.9529	13.948 15.324
L6	44.7219 49.7054	69.0431 76.8252	16538.338 22784.601	15.4577 17.2000	22.3736 24.8667	739.1912 916.2678	33098.438 45599.182	34.5281 38.4199	6.8722 7.7360	13.756 15.485
L7	49.7054 50.5987	84.1628 85.6924	24911.076 26294.181	17.1829 17.4952	24.8667 25.3136	1001.7827 1038.7357	49854.930 52622.960	42.0894 42.8544	7.6511 7.8059	13.966 14.249

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 145.0000-130.0000				1	1	1			
L2 130.0000-84.7500				1	1	1			
L3 84.7500-58.0833				1	1	1			
L4 58.0833-44.2500				1	1	1			
L5 44.2500-31.2500				1	1	1			
L6 31.2500-4.7500				1	1	1			
L7 4.7500-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A	Weight
		No				ft ² /ft	plf
ATCB-B01-005(5/16")	C	No	Inside Pole	133.0000 - 0.0000	6	No Ice	0.0000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
						ft ² /ft	plf	
FSJ4-50B(1/2)	C	No	Inside Pole	133.0000 - 0.0000	2	1/2" Ice	0.0000	0.07
						1" Ice	0.0000	0.07
						No Ice	0.0000	0.14
2" (Nominal) Conduit	C	No	Inside Pole	133.0000 - 0.0000	2	1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
						No Ice	0.0000	0.72

HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	124.0000 - 0.0000	3	No Ice	0.0000	1.08
						1/2" Ice	0.0000	1.08
						1" Ice	0.0000	1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	Inside Pole	124.0000 - 0.0000	1	No Ice	0.0000	1.22
						1/2" Ice	0.0000	1.22
						1" Ice	0.0000	1.22

LDF4-50A(1/2)	C	No	Inside Pole	114.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	114.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	1.30
						1" Ice	0.0000	1.30
LDF7-50A(1-5/8)	C	No	Inside Pole	114.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	114.0000 - 0.0000	1	No Ice	0.1980	1.30
						1/2" Ice	0.2980	2.81
						1" Ice	0.3980	4.94

LCF158-50A(1-5/8")	C	No	Inside Pole	105.0000 - 0.0000	12	No Ice	0.0000	0.80
						1/2" Ice	0.0000	0.80
						1" Ice	0.0000	0.80
FB-L98B-002-75000(3/8)	C	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	105.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	0.59
						1" Ice	0.0000	0.59
2" (Nominal) Conduit	C	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
FB-L98B-002-75000(3/8)	C	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	105.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	0.59
						1" Ice	0.0000	0.59
2" (Nominal) Conduit	C	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72

HJ7-50A(1-5/8")	C	No	Inside Pole	94.0000 - 0.0000	6	No Ice	0.0000	1.04
						1/2" Ice	0.0000	1.04
						1" Ice	0.0000	1.04
HJ7-50A(1-5/8")	C	No	CaAa (Out Of Face)	94.0000 - 0.0000	5	No Ice	0.0000	1.04
						1/2" Ice	0.0000	2.55
						1" Ice	0.0000	4.68
HJ7-50A(1-5/8")	C	No	CaAa (Out Of Face)	94.0000 - 0.0000	1	No Ice	0.1980	1.04
						1/2" Ice	0.2980	2.55
						1" Ice	0.3980	4.68
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4")	C	No	CaAa (Out Of Face)	94.0000 - 0.0000	1	No Ice	0.0000	0.46
						1/2" Ice	0.0000	1.53
						1" Ice	0.0000	3.21

AVA7-50(1-5/8)	C	No	Inside Pole	87.0000 - 0.0000	6	No Ice	0.0000	0.70
						1/2" Ice	0.0000	0.70
						1" Ice	0.0000	0.70

LDF4-50A(1/2)	C	No	CaAa (Out Of	77.0000 - 0.0000	1	No Ice	0.0000	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
			Face)			1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
*** 1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	60.5800 - 35.5000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	145.0000-130.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L2	130.0000-84.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.623	0.90
L3	84.7500-58.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.976	1.20
L4	58.0833-44.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.784	0.62
L5	44.2500-31.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.492	0.59
L6	31.2500-4.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	16.015	1.20
L7	4.7500-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.871	0.21

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	145.0000-130.0000	A	2.307	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.01
L2	130.0000-84.7500	A	2.249	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.939	2.02
L3	84.7500-58.0833	A	2.160	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	36.211	3.90
L4	58.0833-44.2500	A	2.089	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	25.767	1.87
L5	44.2500-31.2500	A	2.027	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.392	1.76
L6	31.2500-4.7500	A	1.880	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	47.012	3.21
L7	4.7500-0.0000	A	1.537	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.413	0.49

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	145.0000- 130.0000	0.0000	0.0000	0.0000	0.0000
L2	130.0000-84.7500	-0.2153	0.1243	-0.5540	0.3199
L3	84.7500-58.0833	-0.4668	0.2695	-1.1238	0.6488
L4	58.0833-44.2500	-0.6193	0.3576	-1.4552	0.8401
L5	44.2500-31.2500	-0.6363	0.3674	-1.4870	0.8585
L6	31.2500-4.7500	-0.6702	0.3869	-1.4828	0.8561
L7	4.7500-0.0000	-0.6755	0.3900	-1.3915	0.8034

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
LLPX310R-V1 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice	4.5378	2.9834	0.05
						1/2" Ice	4.8914	3.5263	0.08
						Ice	5.2539	4.0859	0.13
						1" Ice			
LLPX310R-V1 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice	4.5378	2.9834	0.05
						1/2" Ice	4.8914	3.5263	0.08
						Ice	5.2539	4.0859	0.13
						1" Ice			
LLPX310R-V1 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice	4.5378	2.9834	0.05
						1/2" Ice	4.8914	3.5263	0.08
						Ice	5.2539	4.0859	0.13
						1" Ice			
TIMING 2000	A	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice	0.1079	0.1079	0.00
						1/2" Ice	0.1518	0.1518	0.00
						Ice	0.2031	0.2031	0.01
						1" Ice			
WIMAX DAP HEAD	A	From Leg	4.0000 0.00 6.00	0.000	133.0000	No Ice	1.5467	0.6840	0.03
						1/2" Ice	1.7037	0.7999	0.04
						Ice	1.8681	0.9228	0.06
						1" Ice			
WIMAX DAP HEAD	B	From Leg	4.0000 0.00 6.00	0.000	133.0000	No Ice	1.5467	0.6840	0.03
						1/2" Ice	1.7037	0.7999	0.04
						Ice	1.8681	0.9228	0.06
						1" Ice			
WIMAX DAP HEAD	C	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice	1.5467	0.6840	0.03
						1/2" Ice	1.7037	0.7999	0.04
						Ice	1.8681	0.9228	0.06
						1" Ice			
HORIZON COMPACT	A	From Leg	4.0000 0.00 6.00	0.000	133.0000	No Ice	0.7208	0.3681	0.01
						1/2" Ice	0.8278	0.4499	0.02
						Ice	0.9422	0.5391	0.03
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
HORIZON COMPACT	B	From Leg	4.0000 0.00 6.00	0.000	133.0000	1" Ice			
						No Ice	0.7208	0.3681	0.01
						1/2" Ice	0.8278	0.4499	0.02
(3) 2.375" OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	133.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
(3) 2.375" OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	133.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
(3) 2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
Platform Mount [LP 712-1]	C	None		0.000	133.0000	1" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
*** APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
IBC1900HG-2A	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
IBC1900HG-2A	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
IBC1900HG-2A						1" Ice			
						No Ice	1.2230	0.6599	0.04
						1/2" Ice	1.2230	0.6599	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
IBC1900HG-2A	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
IBC1900BB-1	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
IBC1900BB-1	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
IBC1900BB-1	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
Platform Mount [LP 712-1]	C	None		0.000	124.0000	1" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
*** 800MHz 2X50W RRH W/FILTER	A	From Leg	1.0000 0.00 -4.00	0.000	122.0000	1" Ice			
						No Ice	2.0583	1.9317	0.06
						1/2" Ice	2.2398	2.1087	0.09
800MHz 2X50W RRH W/FILTER	B	From Leg	1.0000 0.00 -4.00	0.000	122.0000	1" Ice			
						No Ice	2.0583	1.9317	0.06
						1/2" Ice	2.2398	2.1087	0.09
800MHz 2X50W RRH W/FILTER	C	From Leg	1.0000 0.00 -4.00	0.000	122.0000	1" Ice			
						No Ice	2.0583	1.9317	0.06
						1/2" Ice	2.2398	2.1087	0.09
PCS 1900MHz 4x45W- 65MHz	A	From Leg	1.0000 0.00 0.00	0.000	122.0000	1" Ice			
						No Ice	2.3218	2.2381	0.06
						1/2" Ice	2.5266	2.4407	0.08
PCS 1900MHz 4x45W- 65MHz	B	From Leg	1.0000 0.00 0.00	0.000	122.0000	1" Ice			
						No Ice	2.3218	2.2381	0.06
						1/2" Ice	2.5266	2.4407	0.08
PCS 1900MHz 4x45W- 65MHz	C	From Leg	1.0000 0.00 0.00	0.000	122.0000	1" Ice			
						No Ice	2.3218	2.2381	0.06
						1/2" Ice	2.5266	2.4407	0.08
Pipe Mount [PM 601-3]	C	None		0.000	122.0000	1" Ice			
						No Ice	4.3900	4.3900	0.20
						1/2" Ice	5.4800	5.4800	0.24
*** BXA-80063/4CFx5 w/ Mount Pipe	A	From Leg	4.0000 0.00	0.000	114.0000	1" Ice			
						No Ice	4.9453	3.6158	0.03
						1/2" Ice	5.3243	4.2169	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
			0.00			Ice 5.7120	4.8343	0.12	
BXA-80063/4CFx5 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	4.9453	3.6158	0.03
						1/2"	5.3243	4.2169	0.07
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	Ice	5.7120	4.8343	0.12
						1" Ice			
						No Ice	4.9453	3.6158	0.03
KS24019-L112A	B	From Leg	4.0000 0.00 2.00	0.000	114.0000	1/2"	5.3243	4.2169	0.07
						Ice	5.7120	4.8343	0.12
						1" Ice			
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	No Ice	4.8000	2.0000	0.04
						1/2"	5.0704	2.1926	0.08
						Ice	5.3481	2.3926	0.12
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	8.4186	7.4197	0.08
						1/2"	8.9558	8.4535	0.15
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	Ice	9.4801	9.3468	0.23
						1" Ice			
						No Ice	8.4186	7.4197	0.08
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	1/2"	8.9558	8.4535	0.15
						Ice	9.4801	9.3468	0.23
						1" Ice			
RRH4X45-AWS4 B66	A	From Leg	4.0000 0.00 0.00	0.000	114.0000	No Ice	2.6600	1.5861	0.06
						1/2"	2.8781	1.7690	0.08
						Ice	3.1037	1.9588	0.11
RRH4X45-AWS4 B66	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	2.6600	1.5861	0.06
						1/2"	2.8781	1.7690	0.08
RRH4X45-AWS4 B66	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	Ice	3.1037	1.9588	0.11
						1" Ice			
						No Ice	2.6600	1.5861	0.06
B25 RRH4X30	A	From Leg	4.0000 0.00 0.00	0.000	114.0000	1/2"	2.8781	1.7690	0.08
						Ice	3.1037	1.9588	0.11
						1" Ice			
B25 RRH4X30	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	No Ice	2.2000	1.7417	0.06
						1/2"	2.3926	1.9204	0.08
						Ice	2.5926	2.1065	0.10
B25 RRH4X30	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	2.2000	1.7417	0.06
						1/2"	2.3926	1.9204	0.08
RRH2x60-700	A	From Leg	4.0000 0.00 0.00	0.000	114.0000	Ice	2.5926	2.1065	0.10
						1" Ice			
						No Ice	2.2000	1.7417	0.06
RRH2x60-700	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	1/2"	2.3926	1.9204	0.08
						Ice	2.5926	2.1065	0.10
						1" Ice			
RRH2x60-700	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	No Ice	3.5002	1.8157	0.06
						1/2"	3.7609	2.0519	0.08
						Ice	4.0285	2.2894	0.11
RRH2x60-700	B	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	3.5002	1.8157	0.06
						1/2"	3.7609	2.0519	0.08
RRH2x60-700	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	Ice	4.0285	2.2894	0.11
						1" Ice			
						No Ice	3.5002	1.8157	0.06
RRH2x60-700	C	From Leg	4.0000 0.00 0.00	0.000	114.0000	1/2"	3.7609	2.0519	0.08
						Ice	4.0285	2.2894	0.11
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
DB-T1-6Z-8AB-OZ	A	From Leg	4.0000 0.00 0.00	0.000	114.0000	1" Ice			
						No Ice	4.8000	2.0000	0.04
						1/2" Ice	5.0704	2.1926	0.08
Platform Mount [LP 712-1]	C	None		0.000	114.0000	1" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
						1" Ice	35.3500	35.3500	1.96

AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	8.2619	6.3042	0.07
						1/2" Ice	8.8215	7.4790	0.14
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	8.2619	6.3042	0.07
						1/2" Ice	8.8215	7.4790	0.14
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	8.2619	6.3042	0.07
						1/2" Ice	8.8215	7.4790	0.14
7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	5.8180	4.6565	0.09
						1/2" Ice	6.2677	5.5082	0.14
7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	5.8180	4.6565	0.09
						1/2" Ice	6.2677	5.5082	0.14
7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	5.8180	4.6565	0.09
						1/2" Ice	6.2677	5.5082	0.14
(2) LGP2140X	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	1.0800	0.3580	0.01
						1/2" Ice	1.2137	0.4536	0.02
(2) LGP2140X	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	1.0800	0.3580	0.01
						1/2" Ice	1.2137	0.4536	0.02
(2) LGP2140X	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	1.0800	0.3580	0.01
						1/2" Ice	1.2137	0.4536	0.02
(2) RRUS-11	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7908	1.1923	0.05
						1/2" Ice	2.9984	1.3395	0.07
(2) RRUS-11	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7908	1.1923	0.05
						1/2" Ice	2.9984	1.3395	0.07
(2) RRUS-11	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7908	1.1923	0.05
						1/2" Ice	2.9984	1.3395	0.07
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	0.9167	0.9167	0.02
						1/2" Ice	1.4583	1.4583	0.04
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	9.8953	7.1792	0.10
						1/2" Ice	10.4700	8.3621	0.18
						1" Ice	11.0098	9.2588	0.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	9.8953	7.1792	0.10
						1/2" Ice	10.4700	8.3621	0.18
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	9.8953	7.1792	0.10
						1/2" Ice	10.4700	8.3621	0.18
RRUS 32 B30	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7427	1.6681	0.05
						1/2" Ice	2.9647	1.8552	0.07
RRUS 32 B30	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7427	1.6681	0.05
						1/2" Ice	2.9647	1.8552	0.07
RRUS 32 B30	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	2.7427	1.6681	0.05
						1/2" Ice	2.9647	1.8552	0.07
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice			
						No Ice	0.9167	0.9167	0.02
						1/2" Ice	1.4583	1.4583	0.04
Platform Mount [LP 712-1]	C	None		0.000	105.0000	1" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
KRY 112 144/1	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	0.3500	0.1750	0.01
						1/2" Ice	0.4259	0.2343	0.01
KRY 112 144/1	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	0.3500	0.1750	0.01
						1/2" Ice	0.4259	0.2343	0.01
KRY 112 144/1	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	0.3500	0.1750	0.01
						1/2" Ice	0.4259	0.2343	0.01
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	95.0000	1" Ice			
						No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	95.0000	1" Ice			
						No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	95.0000	1" Ice			
						No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
						Ice	7.6475	7.5828	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	11.6828	9.8418	0.08
						1/2"	12.4043	11.3657	0.17
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	11.6828	9.8418	0.08
						1/2"	12.4043	11.3657	0.17
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	11.6828	9.8418	0.08
						1/2"	12.4043	11.3657	0.17
RRUS 11 B12	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
RRUS 11 B12	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
RRUS 11 B12	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	1" Ice			
						No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	94.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2"	1.4956	1.4956	0.03
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	94.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2"	1.4956	1.4956	0.03
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	94.0000	1" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2"	1.4956	1.4956	0.03
Platform Mount [LP 712-1]	C	None		0.000	94.0000	1" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2"	29.9400	29.9400	1.65
*** 742 213 w/ Mount Pipe	A	From Leg	1.0000 0.00 0.00	0.000	87.0000	1" Ice			
						No Ice	5.3729	4.6203	0.05
						1/2"	5.9502	6.0004	0.09
742 213 w/ Mount Pipe	B	From Leg	1.0000 0.00 0.00	0.000	87.0000	1" Ice			
						No Ice	5.3729	4.6203	0.05
						1/2"	5.9502	6.0004	0.09
742 213 w/ Mount Pipe	C	From Leg	1.0000 0.00 0.00	0.000	87.0000	1" Ice			
						No Ice	5.3729	4.6203	0.05
						1/2"	5.9502	6.0004	0.09
Pipe Mount [PM 601-3]	C	None		0.000	87.0000	1" Ice			
						No Ice	4.3900	4.3900	0.20
						1/2"	5.4800	5.4800	0.24
*** 58532A	A	From Leg	3.0000 0.00 0.00	0.000	77.0000	1" Ice			
						No Ice	0.1893	0.1893	0.00
						1/2"	0.2483	0.2483	0.00
Side Arm Mount [SO 701-1]	A	None		0.000	77.0000	1" Ice			
						No Ice	0.8500	1.6700	0.07
						1/2"	1.1400	2.3400	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						Ice 1" Ice	1.4300 3.0100	0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	4.0000 0.00 6.00	0.000		133.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.05 0.08 0.12
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	4.0000 0.00 6.00	0.000		133.0000	2.9167	No Ice 1/2" Ice 1" Ice	6.6800 7.0700 7.4600	0.05 0.08 0.12

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 145.0000-130.0000	137.3636	1.353	30	32.221	A	0.000	32.221	32.221	100.00	0.000	0.000
					B	0.000	32.221		100.00	0.000	0.000
					C	0.000	32.221		100.00	0.000	0.000
L2 130.0000-84.7500	106.5926	1.283	28	118.776	A	0.000	118.776	118.776	100.00	0.000	0.000
					B	0.000	118.776		100.00	0.000	0.000
					C	0.000	118.776		100.00	0.000	7.623
L3 84.7500-58.0833	71.1218	1.178	26	84.005	A	0.000	84.005	84.005	100.00	0.000	0.000
					B	0.000	84.005		100.00	0.000	0.000
					C	0.000	84.005		100.00	0.000	10.976
L4 58.0833-44.2500	51.0946	1.099	24	47.968	A	0.000	47.968	47.968	100.00	0.000	0.000
					B	0.000	47.968		100.00	0.000	0.000
					C	0.000	47.968		100.00	0.000	7.784
L5 44.2500-31.2500	37.6860	1.031	23	47.059	A	0.000	47.059	47.059	100.00	0.000	0.000
					B	0.000	47.059		100.00	0.000	0.000
					C	0.000	47.059		100.00	0.000	7.492
L6 31.2500-4.7500	17.7669	0.88	19	104.263	A	0.000	104.263	104.263	100.00	0.000	0.000
					B	0.000	104.263		100.00	0.000	0.000
					C	0.000	104.263		100.00	0.000	16.015
L7 4.7500-0.0000	2.3679	0.85	19	19.852	A	0.000	19.852	19.852	100.00	0.000	0.000
					B	0.000	19.852		100.00	0.000	0.000
					C	0.000	19.852		100.00	0.000	2.871

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 145.0000-130.0000	137.3636	1.353	8	2.3066	37.987	A	0.000	37.987	37.987	100.00	0.000	0.000
						B	0.000	37.987		100.00	0.000	0.000
						C	0.000	37.987		100.00	0.000	0.000
L2 130.0000-84.7500	106.5926	1.283	8	2.2488	135.735	A	0.000	135.735	135.735	100.00	0.000	0.000
						B	0.000	135.735		100.00	0.000	0.000
						C	0.000	135.735		100.00	0.000	24.939
L3 84.7500-58.0833	71.1218	1.178	7	2.1596	94.000	A	0.000	94.000	94.000	100.00	0.000	0.000
						B	0.000	94.000		100.00	0.000	0.000
						C	0.000	94.000		100.00	0.000	36.211
L4 58.0833-44.2500	51.0946	1.099	7	2.0894	52.785	A	0.000	52.785	52.785	100.00	0.000	0.000
						B	0.000	52.785		100.00	0.000	0.000
						C	0.000	52.785		100.00	0.000	25.767
L5 44.2500-31.2500	37.6860	1.031	6	2.0267	51.586	A	0.000	51.586	51.586	100.00	0.000	0.000
						B	0.000	51.586		100.00	0.000	0.000
						C	0.000	51.586		100.00	0.000	24.392
L6 31.2500-4.7500	17.7669	0.88	5	1.8799	112.566	A	0.000	112.566	112.566	100.00	0.000	0.000
						B	0.000	112.566		100.00	0.000	0.000
						C	0.000	112.566		100.00	0.000	47.012
L7 4.7500-0.0000	2.3679	0.85	5	1.5368	21.068	A	0.000	21.068	21.068	100.00	0.000	0.000
						B	0.000	21.068		100.00	0.000	0.000
						C	0.000	21.068		100.00	0.000	7.413

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 145.0000-130.0000	137.3636	1.353	11	32.221	A	0.000	32.221	32.221	100.00	0.000	0.000
					B	0.000	32.221		100.00	0.000	0.000
					C	0.000	32.221		100.00	0.000	0.000
L2 130.0000-84.7500	106.5926	1.283	10	118.776	A	0.000	118.776	118.776	100.00	0.000	0.000
					B	0.000	118.776		100.00	0.000	0.000
					C	0.000	118.776		100.00	0.000	7.623
L3 84.7500-58.0833	71.1218	1.178	9	84.005	A	0.000	84.005	84.005	100.00	0.000	0.000
					B	0.000	84.005		100.00	0.000	0.000
					C	0.000	84.005		100.00	0.000	10.976
L4 58.0833-44.2500	51.0946	1.099	9	47.968	A	0.000	47.968	47.968	100.00	0.000	0.000
					B	0.000	47.968		100.00	0.000	0.000
					C	0.000	47.968		100.00	0.000	7.784
L5 44.2500-31.2500	37.6860	1.031	8	47.059	A	0.000	47.059	47.059	100.00	0.000	0.000
					B	0.000	47.059		100.00	0.000	0.000
					C	0.000	47.059		100.00	0.000	7.492
L6 31.2500-4.7500	17.7669	0.88	7	104.263	A	0.000	104.263	104.263	100.00	0.000	0.000
					B	0.000	104.263		100.00	0.000	0.000
					C	0.000	104.263		100.00	0.000	16.015
L7 4.7500-0.0000	2.3679	0.85	7	19.852	A	0.000	19.852	19.852	100.00	0.000	0.000
					B	0.000	19.852		100.00	0.000	0.000
					C	0.000	19.852		100.00	0.000	2.871

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

Comb. No.	Description
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
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
L1	145 - 130	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	26	-7.82	-1.25	0.82
			Max. Mx	20	-2.79	23.84	1.86
			Max. My	14	-2.78	-1.62	-24.76
			Max. Vy	20	-4.47	23.84	1.86
			Max. Vx	14	4.55	-1.62	-24.76
			Max. Torque	22			-1.00
L2	130 - 84.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.42	-1.03	1.98
			Max. Mx	20	-19.08	693.49	11.39
			Max. My	14	-19.06	-9.25	-699.06
			Max. Vy	20	-28.43	693.49	11.39
			Max. Vx	14	28.57	-9.25	-699.06
			Max. Torque	22			-1.43
L3	84.75 - 58.0833	Pole	Max Tension	1	0.00	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
L4	58.0833 - 44.25	Pole	Max. Compression	26	-70.15	3.36	-0.39
			Max. Mx	20	-26.81	1655.58	18.99
			Max. My	14	-26.80	-15.34	-1665.45
			Max. Vy	20	-32.58	1655.58	18.99
			Max. Vx	14	32.72	-15.34	-1665.45
			Max. Torque	20			-1.23
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.10	4.69	-1.14
			Max. Mx	20	-29.25	1939.37	21.03
			Max. My	14	-29.24	-16.97	-1950.40
			Max. Vy	20	-33.55	1939.37	21.03
			Max. Vx	14	33.69	-16.97	-1950.40
			Max. Torque	20			-0.87
			Max Tension	1	0.00	0.00	0.00
L5	44.25 - 31.25	Pole	Max. Compression	26	-84.96	7.53	-2.78
			Max. Mx	20	-36.22	2571.90	25.34
			Max. My	14	-36.22	-20.40	-2585.39
			Max. Vy	20	-35.65	2571.90	25.34
			Max. Vx	14	35.79	-20.40	-2585.39
			Max. Torque	3			0.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-99.28	11.33	-4.98
			Max. Mx	20	-46.26	3547.54	31.44
			Max. My	14	-46.26	-25.23	-3564.51
			Max. Vy	20	-37.98	3547.54	31.44
			Max. Vx	14	38.11	-25.23	-3564.51
			Max. Torque	25			1.96
			Max Tension	1	0.00	0.00	0.00
L6	31.25 - 4.75	Pole	Max. Compression	26	-101.92	11.90	-5.31
			Max. Mx	20	-48.29	3728.83	32.51
			Max. My	14	-48.29	-26.08	-3746.41
			Max. Vy	20	-38.36	3728.83	32.51
			Max. Vx	14	38.50	-26.08	-3746.41
			Max. Torque	25			2.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.92	11.90	-5.31
			Max. Mx	20	-48.29	3728.83	32.51
			Max. My	14	-48.29	-26.08	-3746.41
			Max. Vy	20	-38.36	3728.83	32.51
			Max. Vx	14	38.50	-26.08	-3746.41
			Max. Torque	25			2.16
			Max Tension	1	0.00	0.00	0.00
L7	4.75 - 0	Pole	Max. Compression	26	-101.92	11.90	-5.31
			Max. Mx	20	-48.29	3728.83	32.51
			Max. My	14	-48.29	-26.08	-3746.41
			Max. Vy	20	-38.36	3728.83	32.51
			Max. Vx	14	38.50	-26.08	-3746.41
			Max. Torque	25			2.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.92	11.90	-5.31
			Max. Mx	20	-48.29	3728.83	32.51
			Max. My	14	-48.29	-26.08	-3746.41
			Max. Vy	20	-38.36	3728.83	32.51
			Max. Vx	14	38.50	-26.08	-3746.41
			Max. Torque	25			2.16
			Max Tension	1	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	101.92	-0.00	0.00
	Max. H _x	21	36.23	38.34	0.23
	Max. H _z	3	36.23	0.28	38.41
	Max. M _x	2	3736.05	0.28	38.41
	Max. M _z	8	3714.25	-38.25	-0.13
	Max. Torsion	25	2.16	19.29	33.37
	Min. Vert	15	36.23	-0.19	-38.48
	Min. H _x	9	36.23	-38.25	-0.13
	Min. H _z	14	48.31	-0.19	-38.48
	Min. M _x	14	-3746.41	-0.19	-38.48
	Min. M _z	20	-3728.83	38.34	0.23
	Min. Torsion	13	-2.16	-19.25	-33.39

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	40.26	0.00	-0.00	0.22	0.71	0.00

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 0 deg - No Ice	48.31	-0.28	-38.41	-3736.05	39.87	-2.04
0.9 Dead+1.6 Wind 0 deg - No Ice	36.23	-0.28	-38.41	-3702.18	39.22	-2.04
1.2 Dead+1.6 Wind 30 deg - No Ice	48.31	19.02	-33.20	-3226.40	-1841.51	-0.92
0.9 Dead+1.6 Wind 30 deg - No Ice	36.23	19.02	-33.20	-3197.06	-1824.97	-0.93
1.2 Dead+1.6 Wind 60 deg - No Ice	48.31	33.08	-19.10	-1853.72	-3210.32	-0.35
0.9 Dead+1.6 Wind 60 deg - No Ice	36.23	33.08	-19.10	-1836.90	-3181.30	-0.35
1.2 Dead+1.6 Wind 90 deg - No Ice	48.31	38.25	0.13	18.04	-3714.25	0.32
0.9 Dead+1.6 Wind 90 deg - No Ice	36.23	38.25	0.13	17.79	-3680.77	0.33
1.2 Dead+1.6 Wind 120 deg - No Ice	48.31	33.13	19.45	1902.41	-3215.74	1.69
0.9 Dead+1.6 Wind 120 deg - No Ice	36.23	33.13	19.45	1884.94	-3186.67	1.69
1.2 Dead+1.6 Wind 150 deg - No Ice	48.31	19.25	33.39	3253.78	-1873.11	2.15
0.9 Dead+1.6 Wind 150 deg - No Ice	36.23	19.25	33.39	3224.02	-1856.22	2.16
1.2 Dead+1.6 Wind 180 deg - No Ice	48.31	0.19	38.48	3746.41	-26.08	1.79
0.9 Dead+1.6 Wind 180 deg - No Ice	36.23	0.19	38.48	3712.05	-25.99	1.80
1.2 Dead+1.6 Wind 210 deg - No Ice	48.31	-18.97	33.32	3245.31	1836.55	0.90
0.9 Dead+1.6 Wind 210 deg - No Ice	36.23	-18.97	33.32	3215.63	1819.66	0.90
1.2 Dead+1.6 Wind 240 deg - No Ice	48.31	-33.12	19.12	1857.07	3216.96	0.35
0.9 Dead+1.6 Wind 240 deg - No Ice	36.23	-33.12	19.12	1840.10	3187.45	0.35
1.2 Dead+1.6 Wind 270 deg - No Ice	48.31	-38.34	-0.23	-32.51	3728.83	-0.30
0.9 Dead+1.6 Wind 270 deg - No Ice	36.23	-38.34	-0.23	-32.21	3694.69	-0.30
1.2 Dead+1.6 Wind 300 deg - No Ice	48.31	-33.23	-19.41	-1896.24	3231.81	-1.44
0.9 Dead+1.6 Wind 300 deg - No Ice	36.23	-33.23	-19.41	-1878.96	3202.15	-1.45
1.2 Dead+1.6 Wind 330 deg - No Ice	48.31	-19.29	-33.37	-3249.41	1881.51	-2.15
0.9 Dead+1.6 Wind 330 deg - No Ice	36.23	-19.29	-33.37	-3219.82	1864.13	-2.16
1.2 Dead+1.0 Ice+1.0 Temp	101.92	0.00	-0.00	5.31	11.90	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.92	-0.06	-13.25	-1348.55	21.64	-1.39
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.92	6.58	-11.46	-1164.81	-658.31	-0.80
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.92	11.43	-6.60	-668.00	-1154.11	-0.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.92	13.22	0.03	9.79	-1336.46	0.50
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.92	11.45	6.68	690.51	-1155.62	1.22
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.92	6.64	11.51	1182.15	-666.15	1.50
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.92	0.04	13.27	1361.59	5.64	1.33
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.92	-6.57	11.49	1179.93	681.15	0.80
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.92	-11.44	6.61	679.43	1179.70	0.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.92	-13.24	-0.05	-2.57	1363.87	-0.50

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.92	-11.47	-6.67	-678.42	1183.43	-1.16
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.92	-6.65	-11.50	-1170.48	692.14	-1.50
Dead+Wind 0 deg - Service	40.26	-0.06	-8.57	-829.15	9.36	0.25
Dead+Wind 30 deg - Service	40.26	4.24	-7.40	-715.93	-408.20	0.20
Dead+Wind 60 deg - Service	40.26	7.38	-4.26	-411.27	-711.99	-0.08
Dead+Wind 90 deg - Service	40.26	8.53	0.03	4.15	-823.93	-0.34
Dead+Wind 120 deg - Service	40.26	7.39	4.34	422.38	-713.21	-0.33
Dead+Wind 150 deg - Service	40.26	4.29	7.45	722.33	-415.22	-0.33
Dead+Wind 180 deg - Service	40.26	0.04	8.58	831.70	-5.26	-0.30
Dead+Wind 210 deg - Service	40.26	-4.23	7.43	720.43	408.14	-0.20
Dead+Wind 240 deg - Service	40.26	-7.39	4.26	412.32	714.51	0.08
Dead+Wind 270 deg - Service	40.26	-8.55	-0.05	-7.06	828.16	0.34
Dead+Wind 300 deg - Service	40.26	-7.41	-4.33	-420.71	717.82	0.38
Dead+Wind 330 deg - Service	40.26	-4.30	-7.44	-721.05	418.12	0.33

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-40.26	0.00	0.00	40.26	0.00	0.000%
2	-0.28	-48.31	-38.41	0.28	48.31	38.41	0.006%
3	-0.28	-36.23	-38.41	0.28	36.23	38.41	0.005%
4	19.02	-48.31	-33.20	-19.02	48.31	33.20	0.000%
5	19.02	-36.23	-33.20	-19.02	36.23	33.20	0.000%
6	33.08	-48.31	-19.10	-33.08	48.31	19.10	0.000%
7	33.08	-36.23	-19.10	-33.08	36.23	19.10	0.000%
8	38.26	-48.31	0.13	-38.25	48.31	-0.13	0.006%
9	38.26	-36.23	0.13	-38.25	36.23	-0.13	0.005%
10	33.13	-48.31	19.45	-33.13	48.31	-19.45	0.000%
11	33.13	-36.23	19.45	-33.13	36.23	-19.45	0.000%
12	19.25	-48.31	33.39	-19.25	48.31	-33.39	0.000%
13	19.25	-36.23	33.39	-19.25	36.23	-33.39	0.000%
14	0.19	-48.31	38.48	-0.19	48.31	-38.48	0.002%
15	0.19	-36.23	38.48	-0.19	36.23	-38.48	0.005%
16	-18.97	-48.31	33.32	18.97	48.31	-33.32	0.000%
17	-18.97	-36.23	33.32	18.97	36.23	-33.32	0.000%
18	-33.12	-48.31	19.12	33.12	48.31	-19.12	0.000%
19	-33.12	-36.23	19.12	33.12	36.23	-19.12	0.000%
20	-38.34	-48.31	-0.23	38.34	48.31	0.23	0.002%
21	-38.34	-36.23	-0.23	38.34	36.23	0.23	0.002%
22	-33.23	-48.31	-19.41	33.23	48.31	19.41	0.000%
23	-33.23	-36.23	-19.41	33.23	36.23	19.41	0.000%
24	-19.29	-48.31	-33.37	19.29	48.31	33.37	0.000%
25	-19.29	-36.23	-33.37	19.29	36.23	33.37	0.000%
26	0.00	-101.92	0.00	-0.00	101.92	0.00	0.001%
27	-0.06	-101.92	-13.25	0.06	101.92	13.25	0.000%
28	6.58	-101.92	-11.46	-6.58	101.92	11.46	0.000%
29	11.43	-101.92	-6.60	-11.43	101.92	6.60	0.000%
30	13.22	-101.92	0.03	-13.22	101.92	-0.03	0.000%
31	11.45	-101.92	6.68	-11.45	101.92	-6.68	0.000%
32	6.64	-101.92	11.51	-6.64	101.92	-11.51	0.000%
33	0.04	-101.92	13.27	-0.04	101.92	-13.27	0.000%
34	-6.57	-101.92	11.49	6.57	101.92	-11.49	0.000%
35	-11.44	-101.92	6.61	11.44	101.92	-6.61	0.000%
36	-13.24	-101.92	-0.05	13.24	101.92	0.05	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
37	-11.47	-101.92	-6.67	11.47	101.92	6.67	0.000%
38	-6.65	-101.92	-11.50	6.65	101.92	11.50	0.000%
39	-0.06	-40.26	-8.57	0.06	40.26	8.57	0.002%
40	4.24	-40.26	-7.41	-4.24	40.26	7.40	0.002%
41	7.38	-40.26	-4.26	-7.38	40.26	4.26	0.002%
42	8.53	-40.26	0.03	-8.53	40.26	-0.03	0.002%
43	7.39	-40.26	4.34	-7.39	40.26	-4.34	0.002%
44	4.29	-40.26	7.45	-4.29	40.26	-7.45	0.002%
45	0.04	-40.26	8.58	-0.04	40.26	-8.58	0.002%
46	-4.23	-40.26	7.43	4.23	40.26	-7.43	0.002%
47	-7.39	-40.26	4.26	7.39	40.26	-4.26	0.002%
48	-8.55	-40.26	-0.05	8.55	40.26	0.05	0.002%
49	-7.41	-40.26	-4.33	7.41	40.26	4.33	0.002%
50	-4.30	-40.26	-7.44	4.30	40.26	7.44	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00008003	0.00011695
3	Yes	14	0.00005460	0.00009596
4	Yes	18	0.00000001	0.00011146
5	Yes	18	0.00000001	0.00008096
6	Yes	18	0.00000001	0.00011090
7	Yes	18	0.00000001	0.00008057
8	Yes	14	0.00008010	0.00010339
9	Yes	14	0.00005465	0.00008669
10	Yes	18	0.00000001	0.00011376
11	Yes	18	0.00000001	0.00008252
12	Yes	18	0.00000001	0.00011544
13	Yes	18	0.00000001	0.00008373
14	Yes	15	0.00003399	0.00006886
15	Yes	14	0.00005458	0.00012165
16	Yes	18	0.00000001	0.00011001
17	Yes	18	0.00000001	0.00007986
18	Yes	18	0.00000001	0.00011030
19	Yes	18	0.00000001	0.00008011
20	Yes	15	0.00003401	0.00008949
21	Yes	15	0.00002281	0.00007060
22	Yes	18	0.00000001	0.00011656
23	Yes	18	0.00000001	0.00008457
24	Yes	18	0.00000001	0.00011443
25	Yes	18	0.00000001	0.00008297
26	Yes	9	0.00000001	0.00001997
27	Yes	17	0.00000001	0.00008051
28	Yes	17	0.00000001	0.00010559
29	Yes	17	0.00000001	0.00010592
30	Yes	17	0.00000001	0.00007962
31	Yes	17	0.00000001	0.00010766
32	Yes	17	0.00000001	0.00010721
33	Yes	17	0.00000001	0.00008072
34	Yes	17	0.00000001	0.00010776
35	Yes	17	0.00000001	0.00010717
36	Yes	17	0.00000001	0.00008076
37	Yes	17	0.00000001	0.00010867
38	Yes	17	0.00000001	0.00010927
39	Yes	14	0.00000001	0.00002271
40	Yes	14	0.00000001	0.00004368
41	Yes	14	0.00000001	0.00003976
42	Yes	14	0.00000001	0.00002374
43	Yes	14	0.00000001	0.00003572
44	Yes	14	0.00000001	0.00004735
45	Yes	14	0.00000001	0.00002443
46	Yes	14	0.00000001	0.00003513

47	Yes	14	0.00000001	0.00003771
48	Yes	14	0.00000001	0.00002462
49	Yes	14	0.00000001	0.00004822
50	Yes	14	0.00000001	0.00003574

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 130	21.19	50	1.147	0.003
L2	130 - 84.75	17.59	50	1.143	0.003
L3	89.25 - 58.0833	8.47	50	0.923	0.001
L4	58.0833 - 44.25	3.46	50	0.571	0.000
L5	49.5 - 31.25	2.52	50	0.475	0.000
L6	31.25 - 4.75	0.99	50	0.306	0.000
L7	4.75 - 0	0.02	50	0.043	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	50	19.75	1.148	0.003	205921
133.0000	LLPX310R-V1 w/ Mount Pipe	50	18.31	1.146	0.003	101340
124.0000	APXVSP18-C-A20 w/ Mount Pipe	50	16.16	1.131	0.002	29010
122.0000	800MHz 2X50W RRH W/FILTER	50	15.69	1.126	0.002	23847
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	50	13.82	1.096	0.002	13929
105.0000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	50	11.78	1.048	0.002	9489
95.0000	AIR -32 B2A/B66AA w/ Mount Pipe	50	9.63	0.974	0.001	7007
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	50	9.42	0.966	0.001	6829
87.0000	742 213 w/ Mount Pipe	50	8.03	0.901	0.001	5897
77.0000	58532A	50	6.22	0.794	0.001	5142

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 130	95.44	24	5.174	0.009
L2	130 - 84.75	79.24	24	5.154	0.007
L3	89.25 - 58.0833	38.17	24	4.163	0.002
L4	58.0833 - 44.25	15.61	24	2.575	0.001
L5	49.5 - 31.25	11.37	24	2.143	0.001
L6	31.25 - 4.75	4.46	24	1.380	0.001
L7	4.75 - 0	0.10	24	0.193	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	24	88.95	5.177	0.010	46758
133.0000	LLPX310R-V1 w/ Mount Pipe	24	82.47	5.168	0.009	23005
124.0000	APXVSPP18-C-A20 w/ Mount Pipe	24	72.80	5.103	0.007	6543
122.0000	800MHz 2X50W RRH W/FILTER	24	70.66	5.079	0.007	5377
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	24	62.23	4.945	0.006	3137
105.0000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	24	53.05	4.725	0.004	2135
95.0000	AIR -32 B2A/B66AA w/ Mount Pipe	24	43.38	4.394	0.003	1574
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	24	42.46	4.356	0.003	1534
87.0000	742 213 w/ Mount Pipe	24	36.20	4.064	0.002	1323
77.0000	58532A	24	28.05	3.580	0.001	1150

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	145 - 130 (1)	TP26.77x24x0.1875	15.000	0.0000	0.0	15.819	-2.78	1052.41	0.003
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	45.250	0.0000	0.0	27.117	-19.05	1829.61	0.010
L3	84.75 - 58.0833 (3)	TP39.6977x33.9247x0.31 25	31.166	0.0000	0.0	39.065	-26.79	2713.34	0.010
L4	58.0833 - 44.25 (4)	TP42.26x39.6977x0.3959	13.833	0.0000	0.0	51.383	-29.23	2783.89	0.011
L5	44.25 - 31.25 (5)	TP44.0424x40.4957x0.45 37	18.250	0.0000	0.0	62.773	-36.21	3338.55	0.011
L6	31.25 - 4.75 (6)	TP48.9503x44.0424x0.49 96	26.500	0.0000	0.0	76.825	-46.26	4246.55	0.011
L7	4.75 - 0 (7)	TP49.83x48.9503x0.5478	4.7500	0.0000	0.0	85.692	-48.29	4926.71	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	145 - 130 (1)	TP26.77x24x0.1875	25.31	575.73	0.044	0.00	575.73	0.000
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	702.32	1286.44	0.546	0.00	1286.44	0.000
L3	84.75 - 58.0833 (3)	TP39.6977x33.9247x0.31 25	1670.60	2197.33	0.760	0.00	2197.33	0.000
L4	58.0833 - 44.25 (4)	TP42.26x39.6977x0.3959	1956.05	2336.65	0.837	0.00	2336.65	0.000
L5	44.25 - 31.25 (5)	TP44.0424x40.4957x0.45 37	2592.08	2984.88	0.868	0.00	2984.88	0.000
L6	31.25 - 4.75 (6)	TP48.9503x44.0424x0.49 96	3572.68	4220.59	0.846	0.00	4220.59	0.000
L7	4.75 - 0 (7)	TP49.83x48.9503x0.5478	3754.83	4976.66	0.754	0.00	4976.66	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	$\frac{T_u}{\phi T_n}$	
L1	145 - 130 (1)	TP26.77x24x0.1875	4.59	526.20	0.009	0.86	1152.87	0.001
L2	130 - 84.75 (2)	TP35.27x26.77x0.25	28.64	914.81	0.031	1.03	2576.03	0.000
L3	84.75 - 58.0833 (3)	TP39.6977x33.9247x0.3125	32.79	1356.67	0.024	0.23	4400.04	0.000
L4	58.0833 - 44.25 (4)	TP42.26x39.6977x0.3959	33.76	1391.94	0.024	0.16	4679.02	0.000
L5	44.25 - 31.25 (5)	TP44.0424x40.4957x0.4537	35.86	1669.27	0.021	0.90	5977.06	0.000
L6	31.25 - 4.75 (6)	TP48.9503x44.0424x0.4996	38.18	2123.27	0.018	1.96	8451.50	0.000
L7	4.75 - 0 (7)	TP49.83x48.9503x0.5478	38.56	2463.35	0.016	2.15	9965.50	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$			
L1	145 - 130 (1)	0.003	0.044	0.000	0.009	0.001	0.047	1.000	4.8.2 ✓
L2	130 - 84.75 (2)	0.010	0.546	0.000	0.031	0.000	0.557	1.000	4.8.2 ✓
L3	84.75 - 58.0833 (3)	0.010	0.760	0.000	0.024	0.000	0.771	1.000	4.8.2 ✓
L4	58.0833 - 44.25 (4)	0.011	0.837	0.000	0.024	0.000	0.848	1.000	4.8.2 ✓
L5	44.25 - 31.25 (5)	0.011	0.868	0.000	0.021	0.000	0.880	1.000	4.8.2 ✓
L6	31.25 - 4.75 (6)	0.011	0.846	0.000	0.018	0.000	0.858	1.000	4.8.2 ✓
L7	4.75 - 0 (7)	0.010	0.754	0.000	0.016	0.000	0.765	1.000	4.8.2 ✓

Section Capacity Table

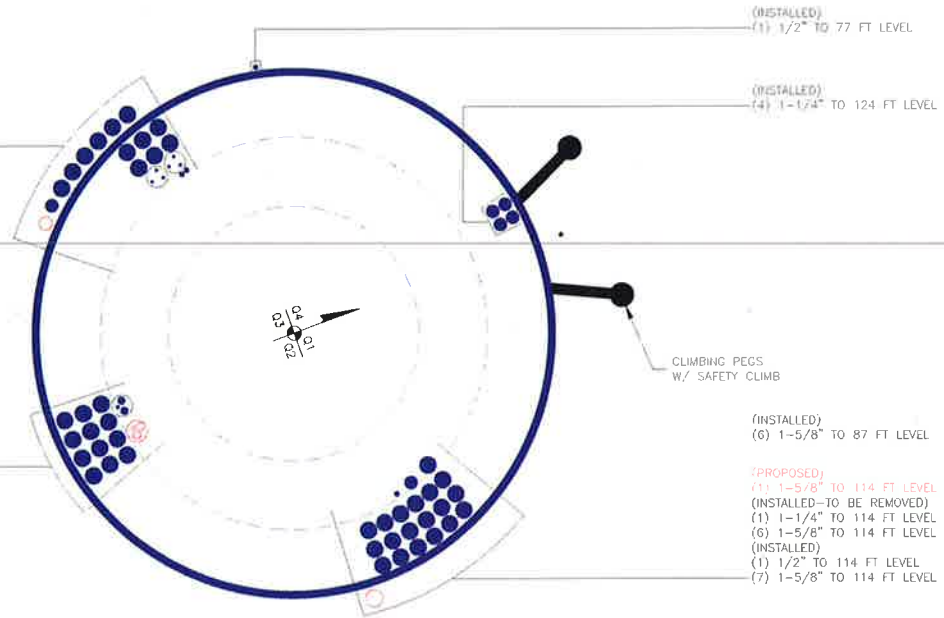
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	145 - 130	Pole	TP26.77x24x0.1875	1	-2.78	1052.41	4.7	Pass
L2	130 - 84.75	Pole	TP35.27x26.77x0.25	2	-19.05	1829.61	55.7	Pass
L3	84.75 - 58.0833	Pole	TP39.6977x33.9247x0.3125	3	-26.79	2713.34	77.1	Pass
L4	58.0833 - 44.25	Pole	TP42.26x39.6977x0.3959	4	-29.23	2783.89	84.8	Pass
L5	44.25 - 31.25	Pole	TP44.0424x40.4957x0.4537	5	-36.21	3338.55	88.0	Pass
L6	31.25 - 4.75	Pole	TP48.9503x44.0424x0.4996	6	-46.26	4246.55	85.8	Pass
L7	4.75 - 0	Pole	TP49.83x48.9503x0.5478	7	-48.29	4926.71	76.5	Pass
Summary								
Pole (L5)							88.0	Pass
RATING =							88.0	Pass

APPENDIX B
BASE LEVEL DRAWING

(RESERVED)
 (1) 1-1/4" TO 94 FT LEVEL
 (INSTALLED-TO BE REMOVED)
 (1) 1-1/4" TO 94 FT LEVEL
 (INSTALLED)
 (12) 1-5/8" TO 94 FT LEVEL

(INSTALLED-IN (2) CONDUITS)
 (6) 5/16" TO 133 FT LEVEL
 (INSTALLED)
 (2) 1/2" TO 133 FT LEVEL

(RESERVED-IN CONDUIT)
 (1) 3/8" TO 105 FT LEVEL
 (2) 3/4" TO 105 FT LEVEL
 (INSTALLED-BUNDLED IN CONDUIT)
 (1) 3/8" TO 105 FT LEVEL
 (2) 3/4" TO 105 FT LEVEL
 (INSTALLED)
 (12) 1-5/8" TO 105 FT LEVEL



(INSTALLED)
 (1) 1/2" TO 77 FT LEVEL

(INSTALLED)
 (4) 1-1/4" TO 124 FT LEVEL

(INSTALLED)
 (6) 1-5/8" TO 87 FT LEVEL

(PROPOSED)
 (1) 1-5/8" TO 114 FT LEVEL
 (INSTALLED-TO BE REMOVED)
 (1) 1-1/4" TO 114 FT LEVEL
 (6) 1-5/8" TO 114 FT LEVEL
 (INSTALLED)
 (1) 1/2" TO 114 FT LEVEL
 (7) 1-5/8" TO 114 FT LEVEL

CLIMBING PEGS
 W/ SAFETY CLIMB

APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 881364
 Site Name: Newington
 App #:

Reactions		
Mu	25.31	ft-kips
Axial, Pu:	2.78	kips
Shear, Vu:	4.59	kips
Elevation:	130	feet

Bolt Threads:
X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
21.87

Pole Manufacturer:	Other
--------------------	-------

If No stiffeners, Criteria: TIA G <-Only Applicable to Unstiffened Cases

Bolt Data			
Qty:	18		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	30		

Flange Bolt Results

Bolt Tension Capacity, $\phi \cdot T_n, B1$: 30.06 kips
 Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$), B: 30.06 kips
 Max Bolt directly applied Tu: 2.10 Kips
 Min. PL "tc" for B cap. w/o Pry: 0.738 in
 Min PL "treq" for actual T w/ Pry: 0.144 in
 Min PL "t1" for actual T w/o Pry: 0.195 in
 T allowable w/o Prying: 30.06 kips $\alpha' < 0$ case
 Prying Force, q: 0.00 kips
 Total Bolt Tension = Tu + q: 2.10 kips
 Non-Prying Bolt Stress Ratio, Tu/B: 7.0% Pass

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

Plate Data		
Diam:	34	in
Thick, t:	1.5	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	4.72	in

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: 0.9 ksi
 Allowable Plate Stress: 45.0 ksi
 Compression Plate Stress Ratio: 2.1% Pass
No Prying
 Tension Side Stress Ratio, $(treq/t)^2$: 0.9% Pass

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
13.54

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

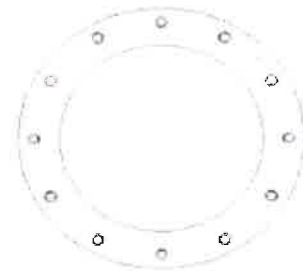
n/a Stiffener Results

Horizontal Weld: n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	26.77	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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

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

Site Data

BU#:	881364	
Site Name:	Newington	
App #:		
Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, F_y :	75	ksi
Strength, F_u :	100	ksi
Bolt Circle:	57	in
Anchor Spacing:	6	in

Base Reactions

TIA Revision:	G	
Factored Moment, M_u :	3755	ft-kips
Factored Axial, P_u :	48	kips
Factored Shear, V_u :	39	kips

Anchor Rod Results

TIA G --> Max Rod ($C_u + V_u/\eta$):	205.5 Kips
Axial Design Strength, $\Phi * F_u * A_{net}$:	260.0 Kips
Anchor Rod Stress Ratio:	79.0% Pass

Plate Data

W=Side:	56	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	12	in

Base Plate Results

Base Plate Stress:	33.2 ksi
PL Design Bending Strength, $\Phi * F_y$:	45.0 ksi
Base Plate Stress Ratio:	73.9% Pass

Flexural Check

PL Ref. Data

Yield Line (in):	29.37
Max PL Length:	29.37

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

N/A - Unstiffened

Stiffener Results

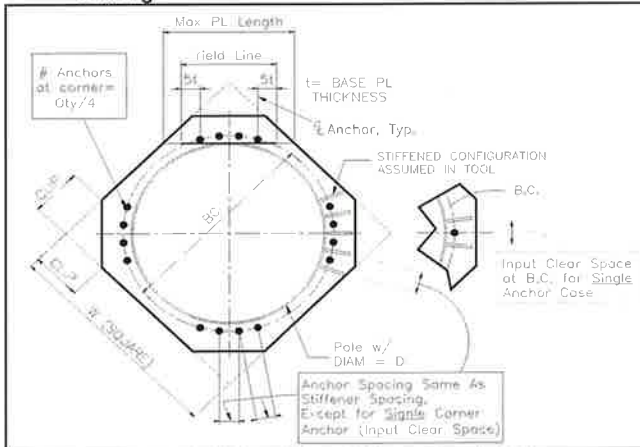
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$:	N/A
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A
----------------------------	-----

Pole Data

Diam:	49.83	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round



** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	3755.0		k-ft
Shear, Vu =	39.0		kips
Axial Load, Pu1 =	48.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	36.0	0.0	kips (from 0.9D + 1.6W)**
OTMu =	3774.5	0.0	k-ft @ Ground

*Axial Load, Pu1 will be used for Soil Compression Analysis.

**Axial Load, Pu2 will be used for Steel Analysis.

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	25	ft
fc' =	3	ksi
ec =	0.003	in/in
L / D Ratio =	3.64	

Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

Steel Parameters

Number of Bars =	28	
Rebar Size =	#11	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	4	in

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	12	125	0	34	Sand				12
2	16	125	0	30	Sand	6000			28
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	16.99	ft, from Grade
Bending Moment, Mu =	4437.27	k-ft, from COR
Resisting Moment, ΦMn =	7605.40	k-ft, from COR

MOMENT RATIO = 58.3% OK

Shear, Vu =	39.00	kips
Resisting Shear, ΦVn =	66.85	kips

SHEAR RATIO = 58.3% OK

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	100.06	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, Cu =	48.00	kips
Comp. Capacity, ΦCn =	140.85	kips

COMPRESSION RATIO = 34.1% OK

Steel Results (ACI 318-05):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	43.68	sq in

Axial, ΦPn (min) =	-2358.72	kips, Where ΦMn = 0 k-ft
Axial, ΦPn (max) =	8653.28	kips, Where ΦMn = 0 k-ft

Axial Load, Pu =	68.47	kips @ 5.75 ft Below Grade
Moment, Mu =	3970.24	k-ft @ 5.75 ft Below Grade
Moment, ΦMn =	6692.46	k-ft

MOMENT RATIO = 59.3% OK

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-05
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA-222-G

- (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
- (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Soil Parameters

Water Table Depth =	10.00	ft
Depth to Ignore Soil =	4.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?*	Ground	
Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)		
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based on the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

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

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

Site Data

BU#: 881364	
Site Name: Newington	
App #:	

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties		
Concrete:		
Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in ²
Reinforcement:		
Clear Cover to Tie=	4.00	in
Horiz. Tie Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in ²
Number of Bars =	28	
As Total=	43.68	in ²
A s/ Aconc, Rho:	0.0079	0.79%

Maximum Shaft Superimposed Forces		
TIA Revision:	G	
Max. Factored Shaft Mu:	3970.24	ft-kips (* Note)
Max. Factored Shaft Pu:	68.47	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads	
1.00	Mu:	3970.24 ft-kips
1.00	Pu:	68.47 kips

Material Properties		
Concrete Comp. strength, f _c =	3000	psi
Reinforcement yield strength, F _y =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2005	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	High	

Solve (Run)

<-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f_c) / F_y) = 0.0027$$

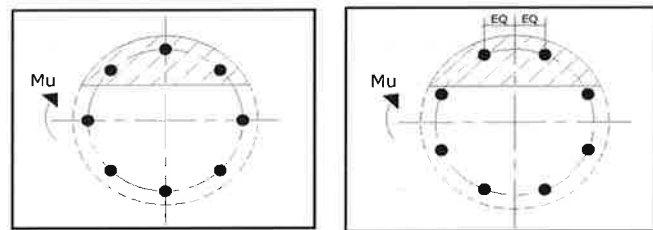
$$200 / F_y = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.79%	OK

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 16.01 in

Extreme Steel Strain, ϵ_t : 0.0117

$\epsilon_t > 0.0050$, Tension Controlled

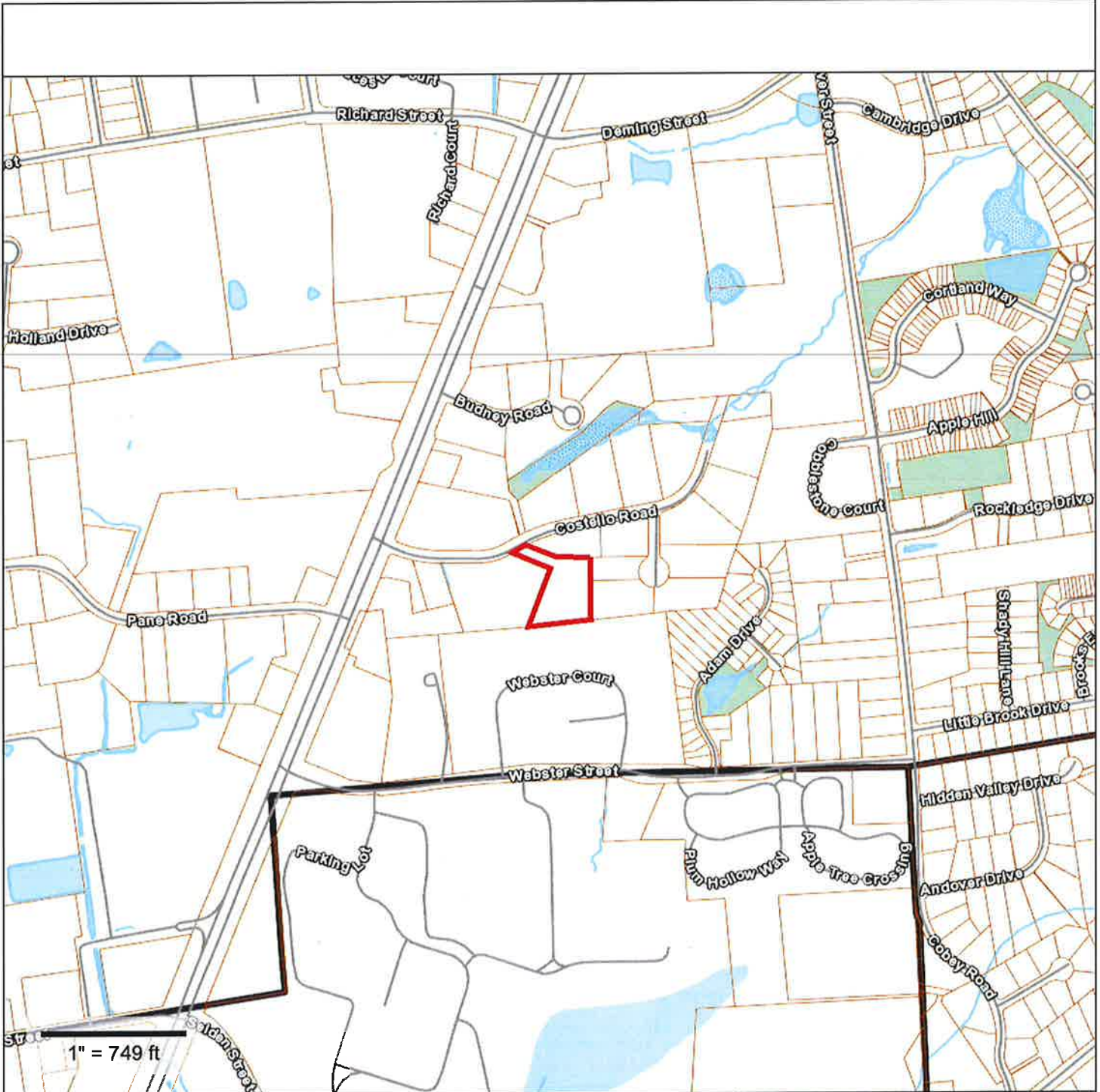
Reduction Factor, ϕ : 0.90

Ref. Shaft Max Axial Capacities, ϕ Max(P _n or T _n):		
Max Pu = ($\phi=0.65$) P _n .		
P _n per ACI 318 (10-2)	8653.28	kips
at Mu=($\phi=0.65$)M _n =	5213.79	ft-kips
Max Tu, ($\phi=0.9$) T _n =	2358.72	kips
at Mu= $\phi=(0.90)$ M _n =	0.00	ft-kips

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ P_n = Pu: 68.47 kips
 Drilled Shaft Moment Capacity, ϕ M_n: 6692.46 ft-kips
 Drilled Shaft Superimposed Mu: 3970.24 ft-kips

(Mu/ϕM_n, Drilled Shaft Flexure CSR:	59.3%
---	--------------

ATTACHMENT 4



Property Information

Property ID 09003094-C0685500
Location 123 COSTELLO RD
Owner Current Owner



**MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT**

CRCOG and AppGeo make no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated October 1, 2013



The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2015.

Town of Newington

ASSESSOR'S
OFFICE



Information on the Property Records for the Municipality of Newington was last updated on 11/4/2016.

Property Summary Information

[Parcel Data And Values](#)
[Building](#)
[Outbuildings](#)
[Sales](#)
[Permits](#)
[Google Map](#)

Parcel Information

Location:	123 COSTELLO RD	Property Use:	Industrial	Primary Use:	Office Warehouse
Unique ID:	C0685500	Map Block Lot:	32/018/00A	Acres:	2.84
490 Acres:	0.00	Zone:	PD	Volume / Page:	0573/0098
Developers Map / Lot:	S/E 2020 & 2815	Census:			

Value Information

	Appraised Value	70% Assessed Value
Land	382,500	267,750
Buildings	118,943	83,260

	Appraised Value	70% Assessed Value
Detached Outbuildings	287,500	201,250
Total	788,943	552,260

Owner's Information

Owner's Data

COSTELLO INDUSTRIES INC
123 COSTELLO RD
NEWINGTON CT 06111

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