Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

April 16, 2019

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

Re: **Notice of Exempt Modification – Facility Modification**
Red Cedar Road, Orange, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 117-foot level on the 180-foot tower off Red Cedar Road (a/k/a South Orange Center Road) in Orange, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's shared use of this tower in 2001. Cellco intends to remove nine (9) of its existing antennas and install six (6) new antennas (model JAHH-65B-R3B) and replace six (6) remote radio heads ("RRHs") with six (6) newer model RRHs. Included in Attachment 1 are specifications for Cellco's replacement antennas and RRHs.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Orange First Selectman, James M. Zeoli; Paul Dinice, Orange's Zoning Administrator and Enforcement Officer; and Crown, the owner of the tower. The Town of Orange is the owner of the Property.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's proposed replacement antennas and RRHs will be located at the same level on the 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 installation of new antennas and RRHs will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A worst-case 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 can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
James M. Zeoli, First Selectman
Paul Dinice, Zoning Administrator and Enforcement Officer
Crown Castle
Tim Parks

ATTACHMENT 1

JAHH-65B-R3B

8-port sector antenna, 2x 698–787, 2x 824-894 and 4x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB (Port 1) and first HB(Port 5).

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

Electrical Specifications

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.5	15.8	18.0	18.4	18.5	18.8
Beamwidth, Horizontal, degrees	67	65	63	63	65	68
Beamwidth, Vertical, degrees	12.4	10.5	5.7	5.2	4.9	4.4
Beam Tilt, degrees	2–14	2–14	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	18	18	20	20	21	23
Front-to-Back Ratio at 180°, dB	32	34	31	35	36	38
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 at 50°C, maximum, watts	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

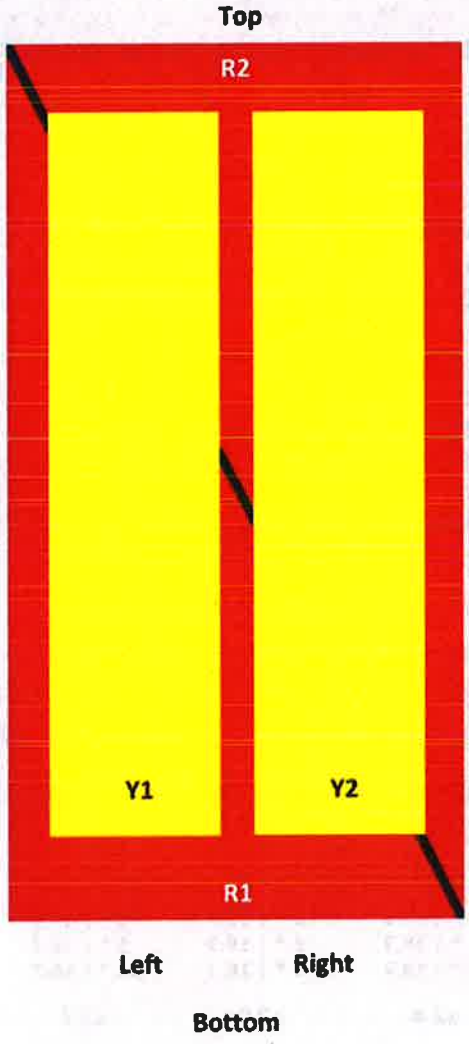
Electrical Specifications, BASTA*

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
Gain by Beam Tilt, average, dBi	2 ° | 14.3 8 ° | 14.3 14 ° | 14.3	2 ° | 15.0 8 ° | 14.9 14 ° | 15.4	0 ° | 17.2 5 ° | 17.6 10 ° | 17.6	0 ° | 17.6 5 ° | 18.2 10 ° | 18.2	0 ° | 17.7 5 ° | 18.3 10 ° | 18.3	0 ° | 17.9 5 ° | 18.7 10 ° | 18.7
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.4	±4	±2.4	±2.9	±2.7
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.5	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	18	17	17	18	19	18
Front-to-Back Total Power at 180° ± 30°, dB	25	24	26	29	27	29
CPR at Boresight, dB	22	23	20	21	21	24
CPR at Sector, dB	11	12	11	11	11	8

* 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.

Array Layout

JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band 1695 – 2360 MHz | 698 – 787 MHz | 824 – 894 MHz

JAHH-65B-R3B

Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	8
RF Connector Quantity, low band	4
RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	301.0 N @ 150 km/h 67.7 lbf @ 150 km/h
Wind Loading, lateral	254.0 N @ 150 km/h 57.1 lbf @ 150 km/h
Wind Loading, maximum	638.0 N @ 150 km/h 143.4 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1828.0 mm | 72.0 in
Width	350.0 mm | 13.8 in
Depth	208.0 mm | 8.2 in
Net Weight, without mounting kit	28.7 kg | 63.3 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	13 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male

JAHH-65B-R3B

Packed Dimensions

Length	1975.0 mm | 77.8 in
Width	456.0 mm | 18.0 in
Depth	357.0 mm | 14.1 in
Shipping Weight	42.0 kg | 92.6 lb

Regulatory Compliance/Certifications

Agency	**Classification**
RoHS 2011/65/EU	Compliant by Exemption
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
China RoHS SJ/T 11364-2014	Above Maximum Concentration Value (MCV)

Included Products

BSAMNT-3 — 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

SAMSUNG

Dual-Band Radio Unit
700/850MHz (B13/B5)
RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B13: DL(746-756MHz)/UL(777-787MHz)
B5: DL(869-894MHz)/UL(824-849MHz)
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 207mm (29.9L)
Weight: 31.9kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

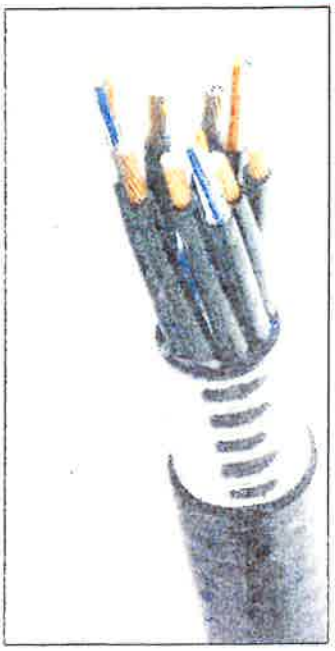


Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

* This data is provisional and subject to change

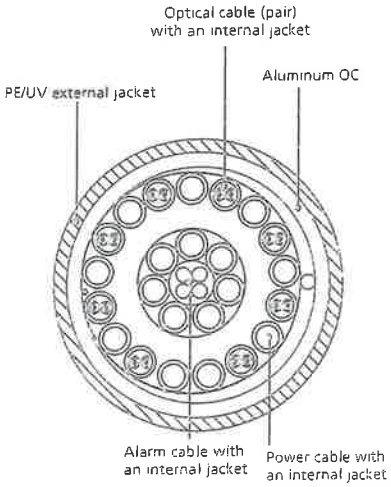


Figure 2: Construction Detail

ATTACHMENT 2

	General	Power	Density					
Site Name: Orange 4								
Tower Height: 180ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	4	693	127	1900	0.0681	1.0000	0.68%	
*Sprint	1	390	127	850	0.0096	0.5667	0.17%	
*Sprint	2	390	127	2500	0.0192	1.0000	0.19%	
*Clearwire	2	153	127	2496	0.0075	1.0000	0.08%	
*Clearwire	1	211	127	11 GHz	0.0052	1.0000	0.05%	
*AT&T-UMTS	2	414	177	850	0.0102	0.5667	0.18%	
*AT&T-LTE	2	521	177	850	0.0128	0.5667	0.23%	
*AT&T-LTE	2	454	177	700	0.0112	0.4667	0.24%	
*AT&T-WCS-LTE	4	875	177	2300	0.0430	1.0000	0.43%	
*AT&T-LTE	4	559	177	700	0.0275	0.4667	0.59%	
*AT&T-AWS-LTE	4	1005	177	2100	0.0494	1.0000	0.49%	
*AT&T-LTE	2	487	177	700	0.0120	0.4667	0.26%	
*AT&T-LTE	4	1154	177	2300	0.0568	1.0000	0.57%	
*Nextel	12	100	137	851	0.0251	0.5673	0.44%	
*T-Mobile	2	1556	145.5	1900	0.0575	1.0000	0.58%	
*T-Mobile	2	778	145.5	2100	0.0288	1.0000	0.29%	
*T-Mobile	1	584	145.5	1900	0.0108	1.0000	0.11%	
*T-Mobile	1	1556	145.5	1900	0.0288	1.0000	0.29%	
*T-Mobile	1	1556	145.5	2100	0.0288	1.0000	0.29%	
*T-Mobile	2	789	145.5	600	0.0292	0.4000	0.73%	
*T-Mobile	2	433	145.5	700	0.0160	0.4667	0.34%	
VZW PCS	**1**	**2766**	**117**	**0.0727**	**1970**	**1.0000**	**7.27%**	
VZW 850 LTE	**1**	**287**	**117**	**0.0075**	**869**	**0.5793**	**1.30%**	
VZW Cellular	**3**	**861**	**117**	**0.0226**	**876**	**0.5840**	**3.87%**	
VZW AWS	**1**	**2911**	**117**	**0.0765**	**2145**	**1.0000**	**7.65%**	
VZW 700	**1**	**1260**	**117**	**0.0331**	**698**	**0.4700**	**7.04%**	
								34.34%
* Source: Siting Council								

ATTACHMENT 3

Date: **February 6, 2019**

GPD GROUP®
ENGINEERING AND ARCHITECTURE
PROFESSIONAL CORPORATION
520 South Main Street, Suite 2531
Akron, OH 44311
(216) 927-8663

Denice Nicholson
Crown Castle
46 Broadway
Albany, NY 12204

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate** **Carrier Site Name:**	 Orange 4
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Order Number:**	842871 ORANGE TRANSFER STATION 555034 1689066 476406, Rev. 0
Engineering Firm Designation:	**GPD Group Project Number:**	2019777.842871.03
Site Data:	**617 South Orange Center Road, Orange, CT 06477, New Haven County** **Latitude 41° 15' 19.98", Longitude -73° 0' 39.20"** **180 Foot - Rohn Monopole Tower**	

Dear Denice Nicholson,

We are pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

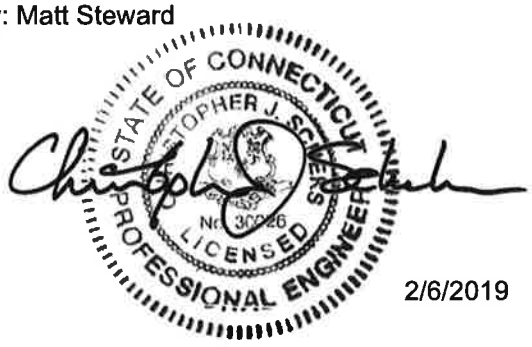
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Matt Steward

Respectfully submitted by:



Christopher J Scheks, P.E.
Connecticut #: 0030026

2/6/2019

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1) INTRODUCTION

The existing 180' monopole consists of five major sections that are connected with slip joints. It has an 18-sided cross section and is evenly tapered from 64.750" (flat-flat) at the base to 24.000" (flat-flat) at the top. The structure is galvanized and does not have aviation lighting.

The tower was designed for AT&T by Paul J. Ford and Company Structural Engineers of Columbus, Ohio in August of 2001. The tower was also designed for a basic wind speed of 85 mph with ½" radial ice (with a reduced wind speed of 74 mph when wind and ice loads were considered simultaneously) in accordance with the TIA/EIA-222-F 1996 standard. The tower was later manufactured by Rohn Industries, Inc. of Peoria, Illinois.

Information on the steel reinforcement in the tower's base foundation was unavailable at the time of the analysis. Therefore, the quantity and size of the steel reinforcement has been assumed based on minimum requirements.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
115.0	117.0	3	Antel	BXA-70063/4CF	2 12	1-1/4 1-5/8
		6	Commscope	JAHH-65B-R3B		
		1	Commscope	RC3DC-3315-PF-48		
		1	RFS/Celwave	DB-T1-6Z-8AB-0Z		
		3	RFS/Celwave	FDJ88020Q4-S1		
		3	Samsung Telecommunications	B5/B13 RRH-BR04C		
		3	Samsung Telecommunications	PCS/AWS DULA-BAND RRH B2/B66		
	115.0	3	Commscope	BSAMNT-SBS-2-2		
		1		Platform Mount [LP 1201-1]		

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)
177.0	177.0	3	Powerwave Tech.	7770.00	1 2 6 12	1/4 3/8 3/4 1-5/8
		3	CCI Antennas	OPA-65R-LCUU-H4		
		3	Kathrein	80010964		
		3	Andrew	SBNHH-1D65A		
		6	Powerwave Technologies	LGP21401		
		6	Powerwave Technologies	7020.00		
		2	Raycap	DC6-48-60-18-8F		
		3	Ericsson	RRUS 32		
		6	CCI Antennas	TPX-070621		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 32 B66		
		1	Raycap	DC6-48-60-0-8F		
		3	Ericsson	RRUS 11		
		3	Ericsson	RRUS 32 B2		
		1	Commscope	WCS-IMFT-AMT		
		1		Platform Mount [LP 303-1]		
148.0	148.0	3	Ericsson	AIR 21 B2A/B4P	1 12	1-1/4 1-5/8
		3	Ericsson	AIR 21 B4A/B2P		
		3	Ericsson	RRUS 11 B12		
		3	Ericsson	KRY 112 144/1		
		1		Platform Mount [LP 303-1]		
	146.0	3	Andrew	LNX-6515DS-A1M		
134.0	134.0	1		Collar Mount [SO 102-3]		
		1		Pipe Mount [601-3]		
	132.0	3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER		
		3	Alcatel Lucent	TME-800MHZ RRH		
	127.0	3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
131.0	134.0	1		Handrail Kit [NA510-1]	1 3	5/8 1-1/4
	131.0	1		Platform Mount [LP 714-1]		
	130.0	3	RFS/Celwave	APXVSPP18-C-A20		
		3	RFS/Celwave	APXVTM14-C-120		
	127.0	9	RFS/Celwave	ACU-A20-N		
		3	Alcatel Lucent	TD-RRH8X20-25		
44.0	45.0	1	PCTEL	GPS-TMG-HR-26NCM	1	1/2
	44.0	1		Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings / Specifications	PJF Job #: 20501-0701, Dated 08/07/2001	Doc ID #: 4705360	CCIsites
Foundation Exploration Report	WEI Project #: 2010-1056, Dated 03/31/2010	Doc ID #: 4529422	CCIsites
Geotechnical Report	WEI Project #: 2010-1056, Dated 03/31/2010	Doc ID #: 4529423	CCIsites

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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 and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD Group 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	180 - 170.583	Pole	TP26.25x24x0.1875	1	-3.68	922.89	4.3	Pass
L2	170.583 - 126	Pole	TP36.525x25.0586x0.25	2	-14.74	1712.76	36.5	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-27.86	2717.98	60.1	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-41.30	3923.00	64.1	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-62.55	5485.62	63.2	Pass
							Summary	
						Pole (L4)	64.1	Pass
						Rating =	64.1	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	66.0	Pass
1	Base Plate	0	Adequate	Pass
1	Base Foundation (Reinforcement)	0	69.1	Pass
1	Base Foundation (Soil Interaction)	0	15.4	Pass

Structure Rating (Maximum From All Components) =	69.1%

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5

4.1) Recommendations

The tower and foundations have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

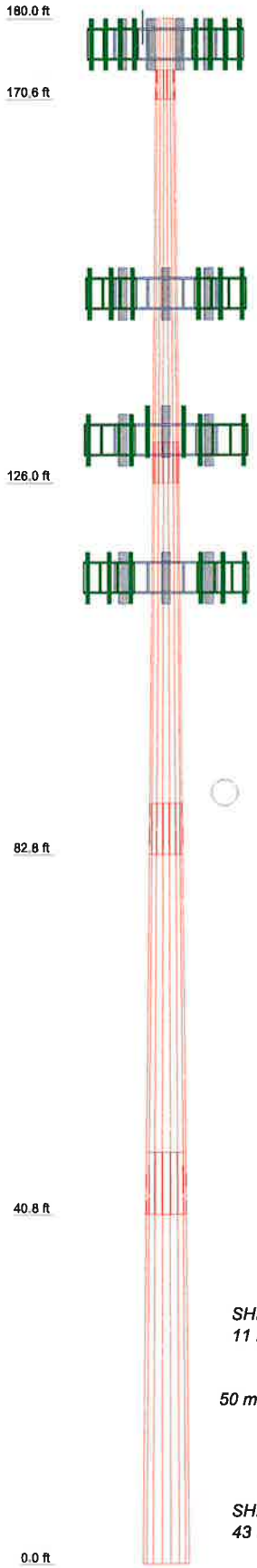
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

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

APPENDIX A

TNXTOWER OUTPUT



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	9.42	18	0.1875	3.42	24.0000	26.2500	A572-65	0.5
2	48.00	18	0.2500	4.75	25.0586	36.5250		4.0
3	48.00	18	0.3125	6.00	34.8903	46.3570		6.5
4	48.00	18	0.3750	7.25	44.2987	55.7650		9.7
5	48.00	18	0.4375		53.2831	64.7500		13.3
								33.9

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 64.1%

ALL REACTIONS ARE FACTORED

AXIAL 97 K

SHEAR 11 K

MOMENT 1309 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 63 K

SHEAR 43 K

MOMENT 4971 kip-ft

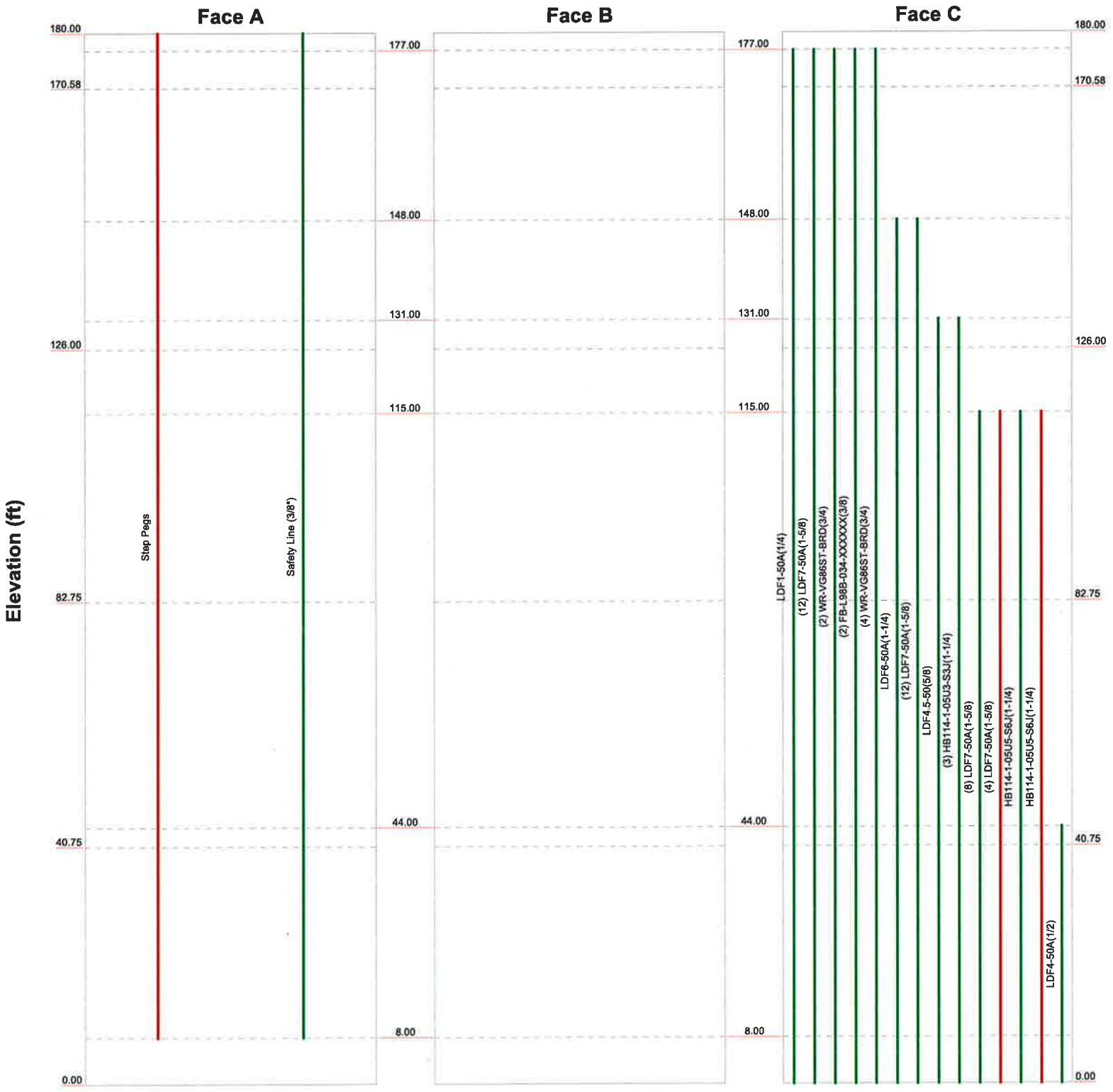
TORQUE 2 kip-ft
REACTIONS - 125 mph WIND

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job:	ORANGE TRANSFER STATION (BU #: 842		
Project:	2019777.842871.03		
Client:	Crown Castle USA, Inc.	Drawn by: msteward	App'd:
Code:	TIA-222-H	Date: 02/06/19	Scale: NTS
Path:	T:\Crown\842871\03\Rev 0\tnx\842871.eri		Dwg No. E-1

0' - 180'

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



GPD
520 South Main Street Suite 2531
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Phone: (330) 572-2100
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Job: ORANGE TRANSFER STATION (BU #: 842			
Project: 2019777.842871.03			
Client: Crown Castle USA, Inc.	Drawn by: msteward	App'd:	
Code: TIA-222-H	Date: 02/06/19	Scale: NTS	
Path: T:\Crown\842871\03\Rev 0\tnx\842871.eri		Dwg No. E-7	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 39.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

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	180.00-170.58	9.42	3.42	18	24.0000	26.2500	0.1875	0.7500	A572-65 (65 ksi)
L2	170.58-126.00	48.00	4.75	18	25.0586	36.5250	0.2500	1.0000	A572-65 (65 ksi)
L3	126.00-82.75	48.00	6.00	18	34.8903	46.3570	0.3125	1.2500	A572-65 (65 ksi)
L4	82.75-40.75	48.00	7.25	18	44.2987	55.7650	0.3750	1.5000	A572-65 (65 ksi)
L5	40.75-0.00	48.00		18	53.2831	64.7500	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	26.6260	15.5104	1331.0484	9.2522	13.3350	99.8162	2663.8483	7.7567	4.2900	22.88
L2	26.2354	19.6856	1530.7090	8.8071	12.7298	120.2463	3063.4321	9.8447	3.9703	15.881
	37.0499	28.7842	4785.2722	12.8776	18.5547	257.9008	9576.8409	14.3948	5.9884	23.954
L3	36.5326	34.2969	5180.6796	12.2751	17.7243	292.2929	10368.1760	17.1517	5.5907	17.89
	47.0239	45.6704	12232.8508	16.3458	23.5494	519.4559	24481.7979	22.8395	7.6088	24.348
L4	46.3796	52.2801	12742.9885	15.5929	22.5037	566.2614	25502.7446	26.1450	7.1366	19.031
	56.5674	65.9279	25554.6382	19.6635	28.3286	902.0785	51142.9018	32.9702	9.1546	24.412
L5	55.7963	73.3827	25891.0136	18.7602	27.0678	956.5239	51816.0953	36.6983	8.6078	19.675
	65.6814	89.3059	46666.8628	22.8309	32.8930	1418.7475	93395.1311	44.6615	10.6260	24.288

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.00-170.58				1	1	1			
L2 170.58-126.00				1	1	1			
L3 126.00-82.75				1	1	1			
L4 82.75-40.75				1	1	1			
L5 40.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Step Pegs	A	No	Surface Ar (CaAa)	180.00 - 8.00	1	1	0.000 0.000	0.8000		2.72
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	115.00 - 0.00	4	4	0.450 0.500	1.9800		0.82
HB114-1-05U5-S6J(1-1/4)	C	No	Surface Ar (CaAa)	115.00 - 0.00	1	1	0.500 0.500	1.5400		1.30

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line (3/8")	A	No	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.04	0.22
							1/2" Ice	0.14	0.75
							1" Ice	0.24	1.28
							2" Ice	0.44	2.34
LDF1-50A(1/4)	C	No	No	Inside Pole	177.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
LDF7-50A(1-5/8)	C	No	No	Inside Pole	177.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	177.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
FB-L98B-034-XXX XXX(3/8)	C	No	No	Inside Pole	177.00 - 0.00	2	No Ice	0.00	0.05
							1/2" Ice	0.00	0.05
							1" Ice	0.00	0.05
							2" Ice	0.00	0.05
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	177.00 - 0.00	4	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
LDF6-50A(1-1/4)	C	No	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
LDF7-50A(1-5/8)	C	No	No	Inside Pole	148.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
LDF4.5-50(5/8)	C	No	No	Inside Pole	131.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
HB114-1-05U3-S3J(1-1/4)	C	No	No	Inside Pole	131.00 - 0.00	3	No Ice	0.00	0.90
							1/2" Ice	0.00	0.90
							1" Ice	0.00	0.90
							2" Ice	0.00	0.90
LDF7-50A(1-5/8)	C	No	No	Inside Pole	115.00 - 0.00	8	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
HB114-1-05U5-S6J(1-1/4)	C	No	No	Inside Pole	115.00 - 0.00	1	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
LDF4-50A(1/2)	C	No	No	Inside Pole	44.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
4' Lightning Rod	A	From Centroid-Face	3.00 0.00 2.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.51 0.89 1.41	0.10 0.51 0.89 1.41	0.01 0.01 0.02 0.03
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.84 6.32 6.77 7.71	4.35 5.20 5.92 7.41	0.06 0.11 0.16 0.29
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.08 6.42 6.77 7.48	4.84 5.40 5.97 7.16	0.07 0.13 0.19 0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.08 6.42 6.77 7.48	4.84 5.40 5.97 7.16	0.07 0.13 0.19 0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.08 6.42 6.77 7.48	4.84 5.40 5.97 7.16	0.07 0.13 0.19 0.33
80010964 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
80010964 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
80010964 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.23 10.74 11.24 12.25	5.51 6.37 7.12 8.64	0.11 0.18 0.26 0.45
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.10 6.54 6.97 7.86	5.19 5.96 6.66 8.09	0.06 0.12 0.18 0.32
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.10 6.54 6.97 7.86	5.19 5.96 6.66 8.09	0.06 0.12 0.18 0.32
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.10 6.54 6.97 7.86	5.19 5.96 6.66 8.09	0.06 0.12 0.18 0.32
(2) LGP21401	A	From Leg	4.00 0.00	0.000	177.00	No Ice 1/2" Ice	1.10 1.24	0.35 0.44	0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) LGP21401	B	From Leg	4.00	0.000	177.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) LGP21401	C	From Leg	4.00	0.000	177.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) 7020.00	A	From Leg	4.00	0.000	177.00	No Ice	0.10	0.17	0.00
			0.00			1/2" Ice	0.15	0.24	0.01
			0.00			1" Ice	0.20	0.31	0.01
						2" Ice	0.33	0.48	0.02
(2) 7020.00	B	From Leg	4.00	0.000	177.00	No Ice	0.10	0.17	0.00
			0.00			1/2" Ice	0.15	0.24	0.01
			0.00			1" Ice	0.20	0.31	0.01
						2" Ice	0.33	0.48	0.02
(2) 7020.00	C	From Leg	4.00	0.000	177.00	No Ice	0.10	0.17	0.00
			0.00			1/2" Ice	0.15	0.24	0.01
			0.00			1" Ice	0.20	0.31	0.01
						2" Ice	0.33	0.48	0.02
DC6-48-60-18-8F	A	From Leg	4.00	0.000	177.00	No Ice	2.20	2.20	0.02
			0.00			1/2" Ice	2.40	2.40	0.04
			0.00			1" Ice	2.60	2.60	0.07
						2" Ice	3.04	3.04	0.13
RRUS 32	A	From Leg	4.00	0.000	177.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
RRUS 32	B	From Leg	4.00	0.000	177.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
RRUS 32	C	From Leg	4.00	0.000	177.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
(2) TPX-070821	A	From Leg	4.00	0.000	177.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
						2" Ice	0.87	0.33	0.03
(2) TPX-070821	B	From Leg	4.00	0.000	177.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
						2" Ice	0.87	0.33	0.03
(2) TPX-070821	C	From Leg	4.00	0.000	177.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
						2" Ice	0.87	0.33	0.03
RRUS 4478 B14	A	From Leg	4.00	0.000	177.00	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
RRUS 4478 B14	B	From Leg	4.00	0.000	177.00	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.57	1.66	0.14
RRUS 4478 B14	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 32 B66	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
DC6-48-60-0-8F	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.40 2.60 3.04	2.20 2.40 2.60 3.04	0.02 0.04 0.07 0.13
RRUS 11	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.10 0.15
RRUS 11	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.10 0.15
RRUS 11	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.78 2.99 3.21 3.66	1.19 1.33 1.49 1.83	0.05 0.07 0.10 0.15
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
WCS-IMFT-AMT	C	From Leg	4.00 0.00 0.00	0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.64 0.75 0.86 1.11	0.47 0.56 0.66 0.89	0.02 0.02 0.03 0.05
Platform Mount [LP 303-1]	C	None		0.000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1.25 1.48 1.71 2.18
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 -2.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.41 12.03 12.65 13.91	9.03 9.92 10.84 12.71	0.08 0.16 0.25 0.46
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 -2.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.41 12.03 12.65 13.91	9.03 9.92 10.84 12.71	0.08 0.16 0.25 0.46
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 -2.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.41 12.03 12.65 13.91	9.03 9.92 10.84 12.71	0.08 0.16 0.25 0.46
AIR 21 B4A/B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37
AIR 21 B4A/B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37
AIR 21 B4A/B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.60 7.03 7.92	5.55 6.30 7.00 8.44	0.10 0.16 0.22 0.37
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
Platform Mount [LP 303-1]	C	None		0.000	148.00	No Ice	14.66	14.66	1.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
TME-800MHZ RRH	A	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	2.13	1.77	0.05
						1/2" Ice	2.32	1.95	0.07
						1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16
TME-800MHZ RRH	B	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	2.13	1.77	0.05
						1/2" Ice	2.32	1.95	0.07
						1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16
TME-800MHZ RRH	C	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	2.13	1.77	0.05
						1/2" Ice	2.32	1.95	0.07
						1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	1.00 0.00 -7.00	0.000	134.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
						2" Ice	3.19	3.09	0.17
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	1.00 0.00 -7.00	0.000	134.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
						2" Ice	3.19	3.09	0.17
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	1.00 0.00 -7.00	0.000	134.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
						2" Ice	3.19	3.09	0.17
800 EXTERNAL NOTCH FILTER	A	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	0.66	0.32	0.01
						1/2" Ice	0.76	0.40	0.02
						1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
800 EXTERNAL NOTCH FILTER	B	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	0.66	0.32	0.01
						1/2" Ice	0.76	0.40	0.02
						1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
800 EXTERNAL NOTCH FILTER	C	From Leg	1.00 0.00 -2.00	0.000	134.00	No Ice	0.66	0.32	0.01
						1/2" Ice	0.76	0.40	0.02
						1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
Pipe Mount [PM 601-3]	C	None		0.000	134.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
Side Arm Mount [SO 102-3]	C	None		0.000	134.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
						2" Ice	4.92	4.92	0.20
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.000	131.00	No Ice	8.02	6.71	0.08
						1/2" Ice	8.48	7.66	0.14
						1" Ice	8.94	8.49	0.22
						2" Ice	9.89	10.20	0.39
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.000	131.00	No Ice	8.02	6.71	0.08
						1/2" Ice	8.48	7.66	0.14
						1" Ice	8.94	8.49	0.22
						2" Ice	9.89	10.20	0.39
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00	0.000	131.00	No Ice	8.02	6.71	0.08
						1/2" Ice	8.48	7.66	0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-1.00			1" Ice	8.94	8.49	0.22
						2" Ice	9.89	10.20	0.39
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.58 7.03 7.47 8.38	4.96 5.75 6.47 7.94	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.58 7.03 7.47 8.38	4.96 5.75 6.47 7.94	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.58 7.03 7.47 8.38	4.96 5.75 6.47 7.94	0.08 0.13 0.19 0.34
(3) ACU-A20-N	A	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01
(3) ACU-A20-N	B	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01
(3) ACU-A20-N	C	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01
TD-RRH8X20-25	A	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8X20-25	B	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8X20-25	C	From Leg	4.00 0.00 -4.00	0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
Miscellaneous [NA 510-1]	C	None		0.000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.00 8.50 11.00 16.00	6.00 8.50 11.00 16.00	0.23 0.34 0.45 0.68
Platform Mount [LP 714-1]	C	None		0.000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.47 44.23 50.99 64.51	37.47 44.23 50.99 64.51	1.60 2.04 2.48 3.36
BXA-70063/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.68 6.14 7.07	3.87 4.67 5.34 6.74	0.03 0.08 0.13 0.25
BXA-70063/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.68 6.14 7.07	3.87 4.67 5.34 6.74	0.03 0.08 0.13 0.25
BXA-70063/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.19 5.68 6.14	3.87 4.67 5.34	0.03 0.08 0.13

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
						2" Ice	7.07	6.74	0.25
(2) JAHH-65B-R3B	A	From Leg	4.00	0.000	115.00	No Ice	9.11	5.98	0.06
			0.00			1/2" Ice	9.58	6.44	0.12
			2.00			1" Ice	10.05	6.91	0.18
						2" Ice	11.02	7.86	0.33
(2) JAHH-65B-R3B	B	From Leg	4.00	0.000	115.00	No Ice	9.11	5.98	0.06
			0.00			1/2" Ice	9.58	6.44	0.12
			2.00			1" Ice	10.05	6.91	0.18
						2" Ice	11.02	7.86	0.33
(2) JAHH-65B-R3B	C	From Leg	4.00	0.000	115.00	No Ice	9.11	5.98	0.06
			0.00			1/2" Ice	9.58	6.44	0.12
			2.00			1" Ice	10.05	6.91	0.18
						2" Ice	11.02	7.86	0.33
RC3DC-3315-PF-48	C	From Leg	4.00	0.000	115.00	No Ice	3.79	2.51	0.03
			0.00			1/2" Ice	4.04	2.72	0.06
			2.00			1" Ice	4.30	2.94	0.10
						2" Ice	4.84	3.41	0.18
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.000	115.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			2.00			1" Ice	5.35	2.39	0.12
						2" Ice	5.93	2.81	0.21
(2) FD9R6004/1C-3L	B	From Leg	4.00	0.000	115.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.00
			2.00			1" Ice	0.47	0.17	0.01
						2" Ice	0.65	0.29	0.02
FD9R6004/1C-3L	C	From Leg	4.00	0.000	115.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.00
			2.00			1" Ice	0.47	0.17	0.01
						2" Ice	0.65	0.29	0.02
(3) B5/B13 RRH-BR04C	A	From Leg	4.00	0.000	115.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			2.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
PCS/AWS DULA-BAND RRH B2/B66	A	From Leg	4.00	0.000	115.00	No Ice	1.88	1.25	0.08
			0.00			1/2" Ice	2.05	1.39	0.10
			2.00			1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
(2) PCS/AWS DULA-BAND RRH B2/B66	B	From Leg	4.00	0.000	115.00	No Ice	1.88	1.25	0.08
			0.00			1/2" Ice	2.05	1.39	0.10
			2.00			1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
BSAMNT-SBS-2-2	C	From Leg	4.00	0.000	115.00	No Ice	1.27	0.97	0.07
			0.00			1/2" Ice	1.47	1.13	0.10
			0.00			1" Ice	1.67	1.30	0.14
						2" Ice	2.10	1.65	0.22
BSAMNT-SBS-2-2	C	From Leg	4.00	0.000	115.00	No Ice	1.27	0.97	0.07
			0.00			1/2" Ice	1.47	1.13	0.10
			0.00			1" Ice	1.67	1.30	0.14
						2" Ice	2.10	1.65	0.22
BSAMNT-SBS-2-2	C	From Leg	4.00	0.000	115.00	No Ice	1.27	0.97	0.07
			0.00			1/2" Ice	1.47	1.13	0.10
			0.00			1" Ice	1.67	1.30	0.14
						2" Ice	2.10	1.65	0.22
Platform Mount [LP 1201-1]	C	None		0.000	115.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
GPS-TMG-HR-26NCM	B	From Leg	4.00 0.00 1.00	0.000	44.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.13 0.18 0.24 0.37	0.13 0.18 0.24 0.37	0.00 0.00 0.01 0.01
Side Arm Mount [SO 701-1]	C	None		0.000	44.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	0.07 0.08 0.09 0.12

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.583	23.419	39	1.116	0.003
L2	174 - 126	22.017	39	1.114	0.002
L3	130.75 - 82.75	12.572	39	0.928	0.001
L4	88.75 - 40.75	5.637	39	0.614	0.001
L5	48 - 0	1.621	39	0.307	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	4' Lightning Rod	39	22.717	1.116	0.003	47276
148.00	AIR 21 B2A/B4P w/ Mount Pipe	39	16.139	1.032	0.002	12411
134.00	TME-800MHZ RRH	39	13.216	0.949	0.001	9123
131.00	APXVSPP18-C-A20 w/ Mount Pipe	39	12.621	0.929	0.001	8716
115.00	BXA-70063/4CF w/ Mount Pipe	39	9.662	0.816	0.001	8125
44.00	GPS-TMG-HR-26NCM	39	1.384	0.279	0.000	7195

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.583	108.440	2	5.170	0.012
L2	174 - 126	101.954	2	5.162	0.011
L3	130.75 - 82.75	58.241	2	4.300	0.005
L4	88.75 - 40.75	26.121	2	2.848	0.002
L5	48 - 0	7.511	2	1.423	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	4' Lightning Rod	2	105.194	5.168	0.012	10560
148.00	AIR 21 B2A/B4P w/ Mount Pipe	2	74.753	4.781	0.007	2721
134.00	TME-800MHZ RRH	2	61.223	4.399	0.006	1993
131.00	APXVSPP18-C-A20 w/ Mount Pipe	2	58.468	4.307	0.005	1903
115.00	BXA-70063/4CF w/ Mount Pipe	2	44.767	3.783	0.004	1769
44.00	GPS-TMG-HR-26NCM	2	6.411	1.294	0.001	1553

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 170.583 (1)	TP26.25x24x0.1875	9.42	0.00	0.0	15.0246	-3.68	878.94	0.004
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	48.00	0.00	0.0	27.8838	-14.74	1631.20	0.009
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	48.00	0.00	0.0	44.2487	-27.86	2588.55	0.011
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	48.00	0.00	0.0	63.8666	-41.30	3736.19	0.011
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	48.00	0.00	0.0	89.3059	-62.55	5224.40	0.012

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	180 - 170.583 (1)	TP26.25x24x0.1875	21.19	522.20	0.041	0.00	522.20	0.000
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	493.43	1327.15	0.372	0.00	1327.15	0.000
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	1643.53	2657.33	0.618	0.00	2657.33	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	3046.76	4609.00	0.661	0.00	4609.00	0.000
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	4971.30	7639.82	0.651	0.00	7639.82	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 170.583 (1)	TP26.25x24x0.1875	6.99	263.68	0.026	0.79	582.98	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	21.55	489.36	0.044	1.09	1505.97	0.001
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	31.71	767.96	0.041	0.68	3033.90	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	37.10	1111.22	0.033	0.68	5267.03	0.000
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	42.73	1567.32	0.027	0.65	8827.42	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 170.583 (1)	0.004	0.041	0.000	0.026	0.001	0.046	1.050	4.8.2
L2	170.583 - 126 (2)	0.009	0.372	0.000	0.044	0.001	0.383	1.050	4.8.2
L3	126 - 82.75 (3)	0.011	0.618	0.000	0.041	0.000	0.631	1.050	4.8.2
L4	82.75 - 40.75 (4)	0.011	0.661	0.000	0.033	0.000	0.673	1.050	4.8.2
L5	40.75 - 0 (5)	0.012	0.651	0.000	0.027	0.000	0.663	1.050	4.8.2

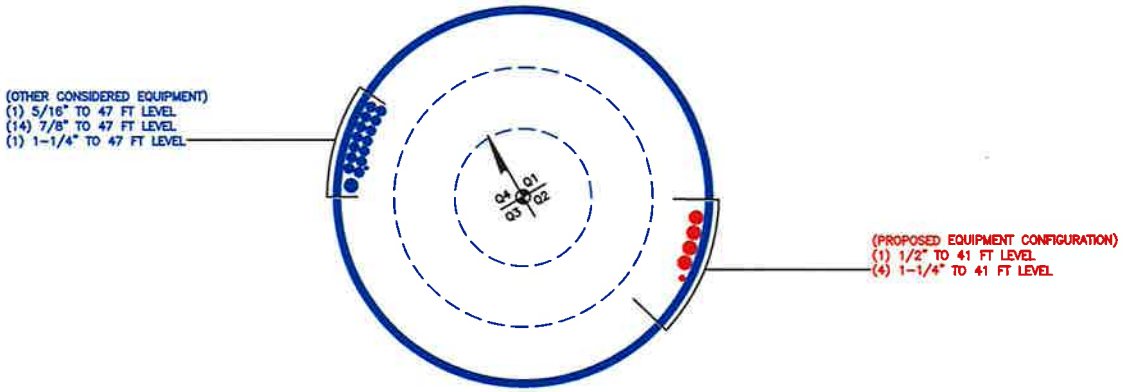
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	180 - 170.583	Pole	TP26.25x24x0.1875	1	-3.68	922.89	4.3	Pass
L2	170.583 - 126	Pole	TP36.525x25.0586x0.25	2	-14.74	1712.76	36.5	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-27.86	2717.98	60.1	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-41.30	3923.00	64.1	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-62.55	5485.62	63.2	Pass

Summary	ELC:	Load Case 7
Pole (L4)	64.1	Pass
Rating =	64.1	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 828818 TOWER ID: C_BASELEVEL

N.T.S.

PLOT DATE: 10/5/2016 FILE NAME: 828818_BASELEVEL.dwg

CROWN REGION ADDRESS

USA

25/09/13	AS-BUILT INFORMATION ADDED PER WORK ORDER # 828818	AMD
21/08/14	UPDATED PER WORK ORDER # 916482	CJH
24/12/14	UPDATED PER WORK ORDER # 980282	VL
13/4/2015	UPDATED PER WORK ORDER 1003770	ADE
19/10/2015	UPDATED PER WORK ORDER 1108858	BB
31/03/16	UPDATED PER WORK ORDER 1158808	ADE
22/07/16	UPDATED PER WORK ORDER 1274833	ADE
27/03/17	UPDATED PER WORK ORDER 1364531	JMP
01/11/17	UPDATED PER WORK ORDER 1483436	CJR

DRAWN BY: AGT
CHECKED BY:
DRAWING DATE: 03/27/2013

SITE NUMBER:
SITE NAME:

SITE NAME

VY105 GLENDORA WATER PLAN

BUSINESS UNIT NUMBER

828818

SITE ADDRESS

1051 E SIERRA MADRE AVE
GLENDORA, CA 91741
LOST ANGELES COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

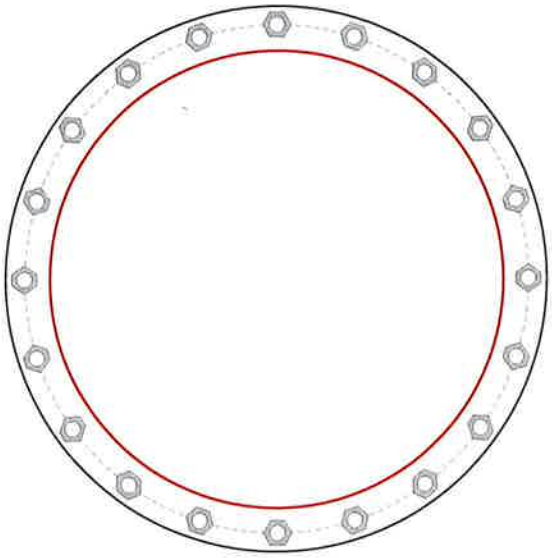
Monopole Base Plate Connection

Site Info	
BU #	842871
Site Name	ANGE TRANSFER STATI
Order #	476406 Rev 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{gr} (in)	0.75

Applied Loads	
Moment (kip-ft)	4971.30
Axial Force (kips)	62.55
Shear Force (kips)	42.73

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 72" BC

Base Plate Data

77.25" OD x 2.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

64.75" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 168.77	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.14	ϕVn = 73.13	**66.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Rohn OK**

Pier and Pad Foundation

BU # :	842871
Site Name:	ORANGE TRANSF
App. Number:	476406 Rev 0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions

Compression, P_{comp}:	63	kips
Base Shear, Vu_comp:	43	kips
Moment, M_u:	4971	ft-kips
Tower Height, **H**:	180	ft
BP Dist. Above Fdn, bp_{dist}:	3.25	in

Pier Properties

Pier Shape:	Circular	
Pier Diameter, **dpier**:	8	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	24	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties

Depth, **D**:	7	ft
Pad Width, **W**:	48	ft
Pad Thickness, **T**:	6	ft
Pad Rebar Size (Bottom), **Sp**:	11	
Pad Rebar Quantity (Bottom), **mp**:	47	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	32	degrees
SPT Blow Count, N_{blows}:	50	
Base Friction, μ:	0.35	
Neglected Depth, **N**:	3.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	7	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	850.94	43.00	**4.8%**	**Pass**
Bearing Pressure (ksf)	9.00	1.46	**15.4%**	**Pass**
*Overturning (kip*ft)*	46805.82	5326.65	**11.4%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	6966.78	5057.00	**69.1%**	**Pass**
Pier Compression (kip)	23994.73	81.10	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	21573.94	2311.40	**10.2%**	**Pass**
Pad Shear - 1-way (kips)	3165.21	162.17	**4.9%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.012	**6.9%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	23177.12	3034.20	**12.5%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**15.4%**
Structural Rating*:	**69.1%**

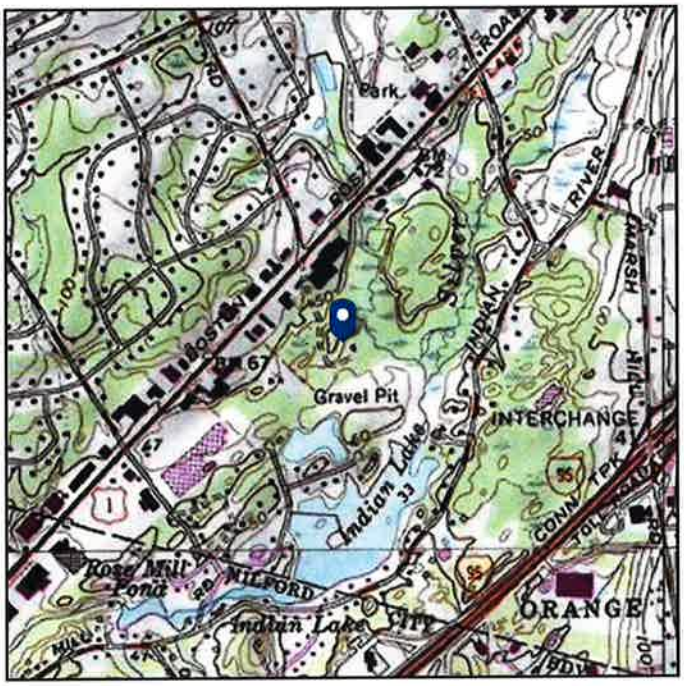
Version 3.1.0

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 39.34 ft (NAVD 88)
Latitude: 41.25555
Longitude: -73.010889



Wind

Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Tue Feb 05 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

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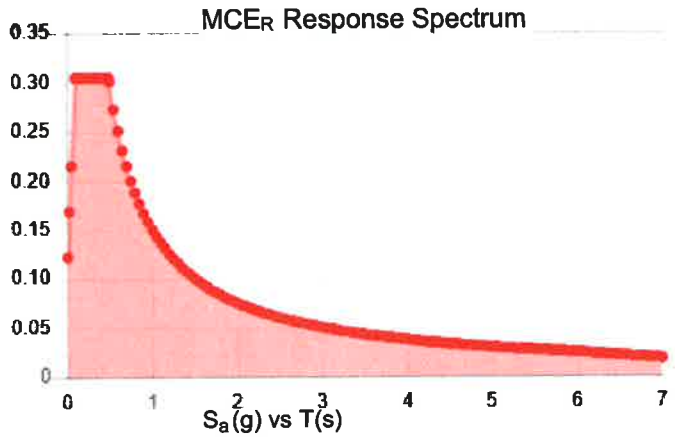
Seismic

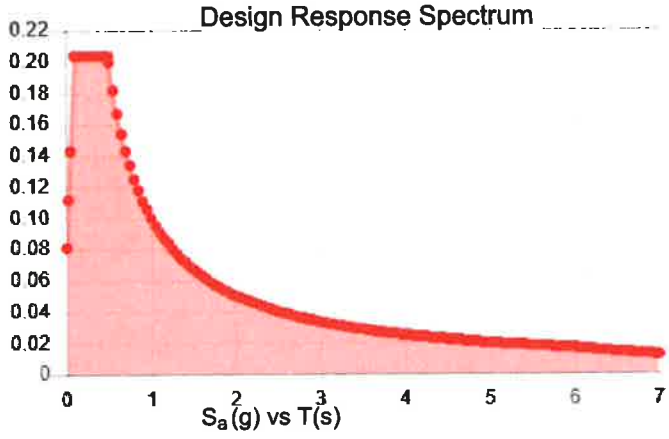
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.191	S_{DS} :	0.204
S_1 :	0.063	S_{D1} :	0.1
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.101
S_{MS} :	0.305	PGA_M :	0.161
S_{M1} :	0.15	F_{PGA} :	1.599
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Feb 05 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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Ice

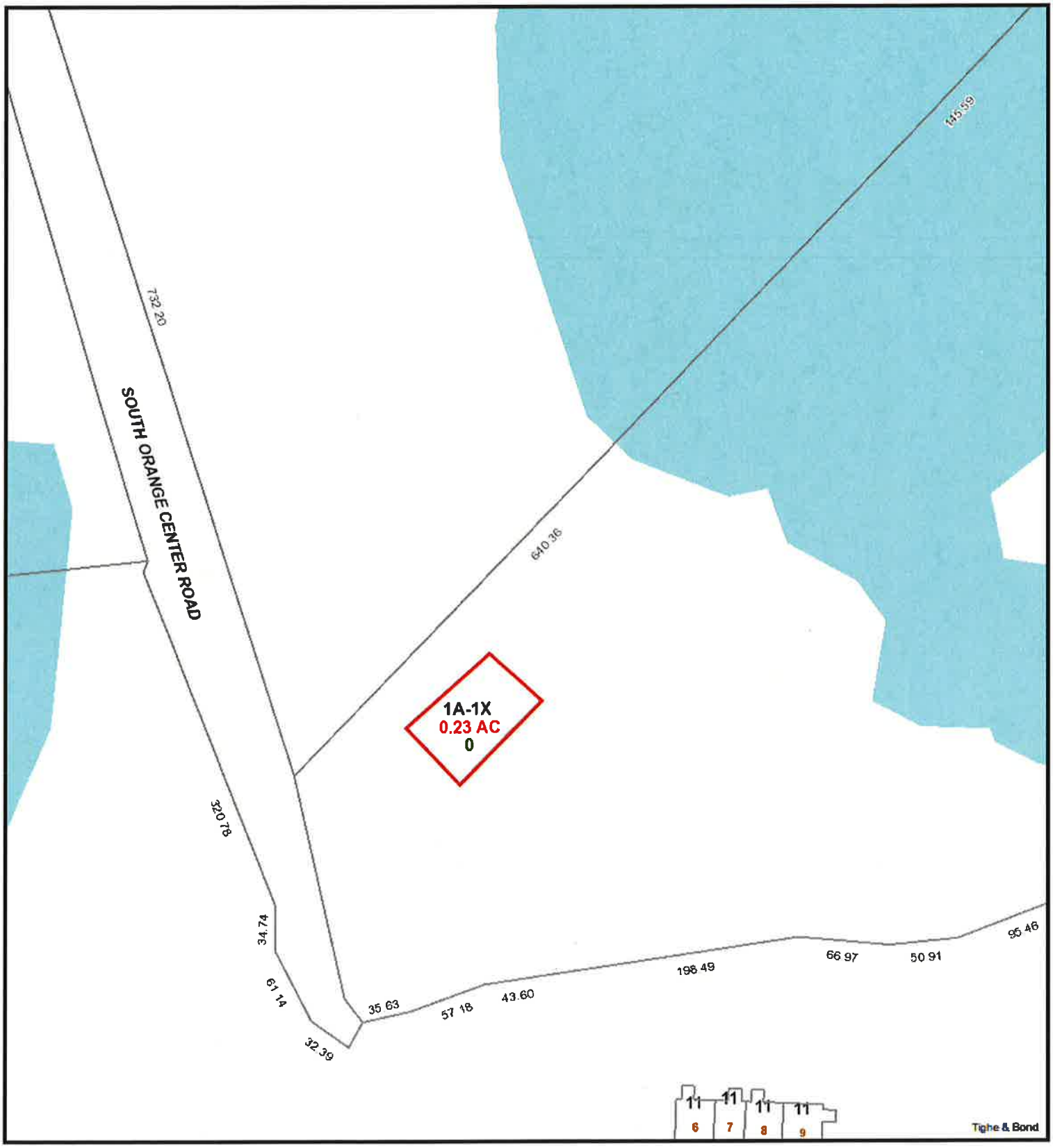
Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Feb 05 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

ATTACHMENT 4



4/5/2019 2:12:16 PM

Scale: 1"=100'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

RED CEDAR RD

Location	RED CEDAR RD	**Mblu**	13/ 7/ 1A/ 1X/
Acct#	00034605	**Owner**	ORANGE TOWN OF
Assessment	$67,000	**Appraisal**	$95,600
PID	5668	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$17,900	$77,700	$95,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$12,600	$54,400	$67,000

Owner of Record

Owner ORANGE TOWN OF
Co-Owner C/O ATT SERVICES INC TOWER ASSET GROUP
Address 575 MOROSGO DR NE 12TH FL EAST
ATLANTA , GA 30324

Sale Price $0
Certificate
Book & Page 232/ 655
Sale Date 12/12/2001
Instrument 00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
ORANGE TOWN OF	$0		232/ 655	00	12/12/2001

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Stories	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	

Building Photo

13-7-1A-1X 03/08/2017
(http://images.vgsi.com/photos/OrangeCTPhotos//\00\01\70/65.

Building Layout

Building Layout
(http://images.vgsi.com/photos/OrangeCTPhotos//Sketches/566

Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Stacks	
Fireplace(s)	
Gas Fireplace(s)	
Attic	
Frame	
Traffic	
Bsmt Gar(s)	
SF FBM	
Basement	
Bsmt Floor	

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	520
Description	Comm Vacant
Zone	RES
Neighborhood	010
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.23
Frontage	
Depth	
Assessed Value	$54,400
Appraised Value	$77,700

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD7	Cell Shed			160 UNITS	$6,000	1
SHD7	Cell Shed			280 UNITS	$10,500	1
FN4	8' Chain Link			360 L.F.	$1,400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$17,900	$77,700	$95,600
2016	$17,900	$87,200	$105,100
2015	$17,900	$87,200	$105,100

Assessment

Valuation Year	Improvements	Land	Total
2017	$12,600	$54,400	$67,000
2016	$12,600	$61,000	$73,600
2015	$12,600	$61,000	$73,600

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	2	2	neopost 04/16/2019 US POSTAGE $002.79⁰ ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)* SMC		

	USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.		James M. Zeoli, First Selectman Town of Orange 617 Orange Center Road Orange, CT 06477	OLD STATE HOUSE STA 06106 APR 16 2019 USPS	[redacted]		
2.		Paul Dinice, Zoning Administrator and Enforcement Officer Town of Orange 617 Orange Center Road Orange, CT 06477				
3.						
4.						
5.						
6.						

Orange 4

See Reverse for Instructions