ROBINSON & COLE LLP

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

March 21, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
130 Birdseye Road, Farmington, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 109-foot level of the existing 140-foot tower at 130 Birdseye Road in Farmington, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of the existing tower in 2005. Cellco now intends to modify its facility replacing seven (7) of its existing antennas with three (3) model BXA-70063-4CF, 850 MHz antennas; one (1) model 80010735V01, 700 MHz antenna; and three (3) model BXA-171063-12CF, 2100 MHz antennas, all at the same 109-foot level on the tower. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable attached to the outside of the monopole tower. 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 letter is being sent to Kathleen A. Eagen, Town Manager for the Town of Farmington. A copy of this letter is also being sent to Media Park Realty, 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. The replacement antennas and RRHs will be located at the 109-foot level on the 140-foot tower.

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

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

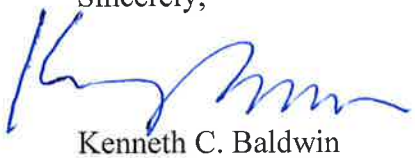
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for each of Cellco's operating frequencies are included behind Attachment 2. The Far Field calculations demonstrate that Cellco's modified facility will operate well within the RF emissions standards established by the FCC.

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, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification Report included in Attachment 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures
Copy to:
Kathleen A. Eagen, Farmington Town Manager
Media Park Realty
Sandy M. Carter

ATTACHMENT 1

BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

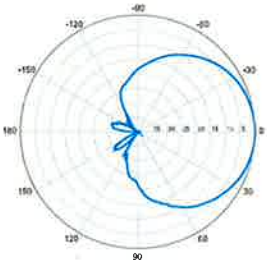
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	17°	15°
Gain	12.5 dBd (14.6 dBi)	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 9, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-16.3 dB	-22.1 dB
Front-to-back ratio (+/-30°)	-36.1 dB	-34.9 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 285 x 133 mm	47.4 x 11.2 x 5.2 in
Depth with z-brackets	173 mm	6.8 in
Weight without mounting brackets	4.5 kg	9.9 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.34 m² Side: 0.16 m²	Front: 3.7 ft² Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 498 N Side: 260 N	Front: 111 lbf Side: 55 lbf

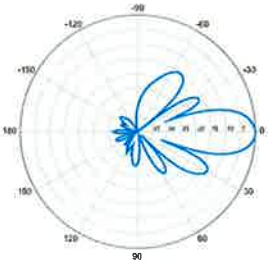
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit	36210006	40-115 mm 1.57-4.5 in	4.1 kg 9 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-4CF-EDIN-X-FP		

BXA-70063-4CF-EDIN-X



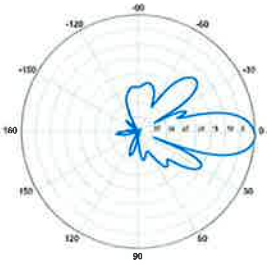
Horizontal | 750 MHz

BXA-70063-4CF-EDIN-0



0° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-2

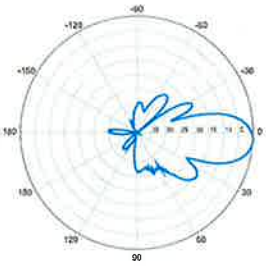


2° | Vertical | 750 MHz

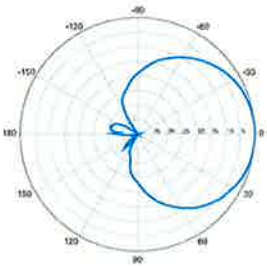
BXA-70063-4CF-EDIN-3

3° | Vertical | 750 MHz

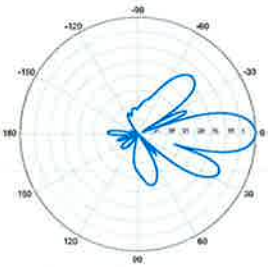
BXA-70063-4CF-EDIN-4



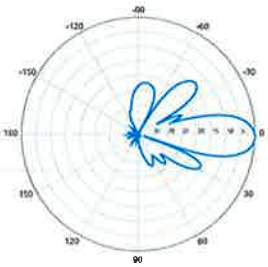
4° | Vertical | 750 MHz



Horizontal | 850 MHz

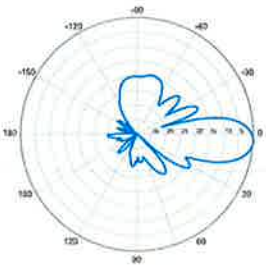


0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

3° | Vertical | 850 MHz

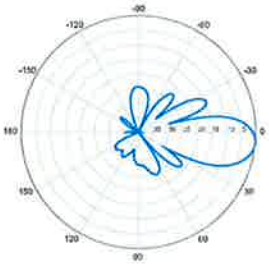


4° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-X

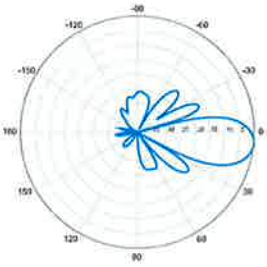
X-Pol | FET Panel | 63° | 13.0 dBd

BXA-70063-4CF-EDIN-5



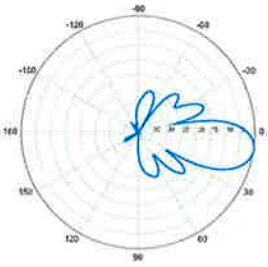
5° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-6



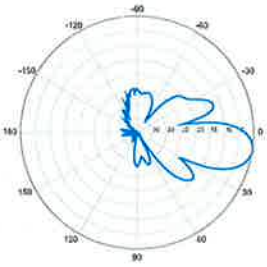
6° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-8



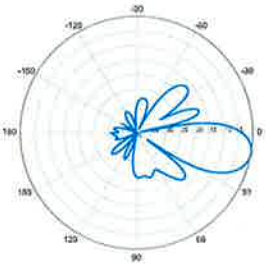
8° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-9

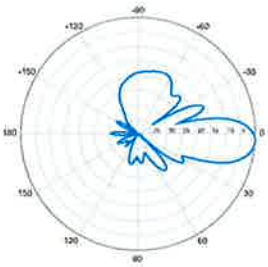


9° | Vertical | 750 MHz

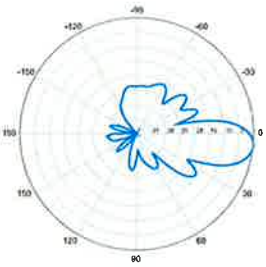
BXA-70063-4CF-EDIN-10



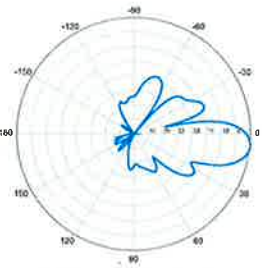
10° | Vertical | 750 MHz



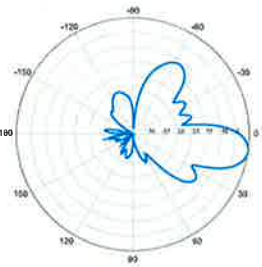
5° | Vertical | 850 MHz



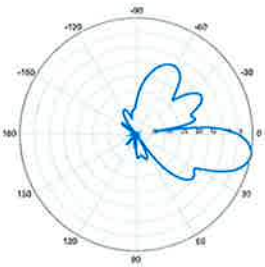
6° | Vertical | 850 MHz



8° | Vertical | 850 MHz

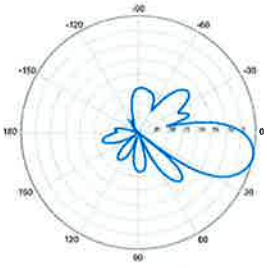


9° | Vertical | 850 MHz



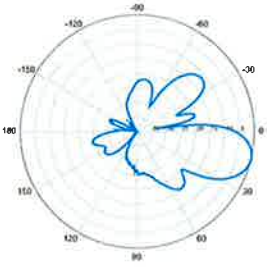
10° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-12

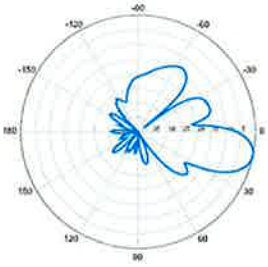


12° | Vertical | 750 MHz

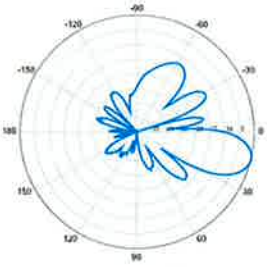
BXA-70063-4CF-EDIN-14



14° | Vertical | 750 MHz



12° | Vertical | 850 MHz



14° | Vertical | 850 MHz

KATHREIN
SCALA DIVISION

800 10735V01

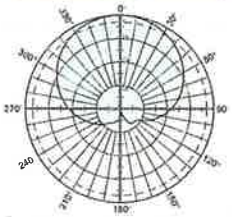
65° Single Band Panel Antenna, 6'

	Antenna
Single Band (MHz)	**698–894**
Dual Polarization	**X**
HPBW	**65°**
Adj. Electrical Downtilt Manual or optional remote control	**0°–10°**

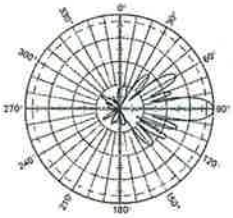
General specifications:

Frequency range	698–894 MHz
VSWR	<1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Maximum input power	500 watts per input (at 50°C)
Connector	2 x 7-16 DIN female (long neck) (bottom mounted)
Isolation	>30 dB
Electrical downtilt	0–10 degrees (continuously adjustable)
See reverse for order information.	

698–894 MHz



Horizontal pattern
±45°- polarization



Vertical pattern
±45°- polarization
0°–10° electrical downtilt

Specifications:

	698–806 MHz	824–894 MHz
Gain	15.5 dBi	16 dBi
Front-to-back ratio	>30 dB (co-polar) 35 dB (average)	>30 dB (co-polar) 35 dB (average)
+45° and -45° polarization horizontal beamwidth	67° (half-power)	65° (half-power)
+45° and -45° polarization vertical beamwidth	11.3° (half-power)	10° (half-power)
Min. sidelobe suppression for first sidelobe above main beam average	0° 5° 10° T 16 17 17 dB 16 19 20 dB	0° 5° 10° T 18 17 16 dB 20 20 20 dB
Cross polar ratio Main direction 0° Sector ±60°	25 dB (typical) >11 dB, Average: 15 dB	25 dB (typical) >11 dB, Average: 15 dB

IRT specifications:

Logical interface ex factory[1]	3GPP/AISG 2.0
Protocols	AISG 1.1 and 3GPP/AISG 2.0 compliant
Hardware interface[2]	2 x 8 pin connector acc. IEC 60130-9; according to AISG: – IRT in (male): Control / Daisy chain in – IRT in (female): Daisy chain out
Power supply	10–30 V
Power consumption	<1 watt (standby) <8.5 watts (motor activated)
Adjustment time (full range)	40 sec.
Adjustment cycles	>50,000
Certification	FCC 15.107 Class B Computing Devices

[1] The protocol of the logical interface can be switched from 3GPP/AISG 2.0 to AISG 1.1 and vice versa with a vendor specific command. Start-up operation of the RCU 86010149 is possible in an RET system supporting AISG 1.1 or supporting 3GPP/AISG 2.0 after performing a layer 2 reset before address assignment. The protocol can also be changed as follows: AISG 1.1 to 3GPP: Enter "3GPP" into the additional data filed "Installer's ID" and perform a layer 7 reset or a power reset. 3GPP to AISG 1.1: Enter "AISG 1" into the additional datafield "Installer's ID" and perform a layer 2 reset or a power reset. After switching the protocol any other information can be entered into the "Installer's ID" field.

[2] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ("hand-tightened"). The connector should be tightened by hand only!

TÜV 11387-D
936.4273/a

RoHS Lead-Free Oct 19, 2012

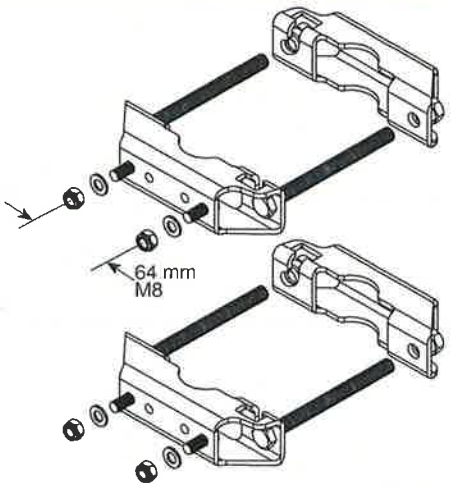
AISG Antenna Interface Standards Group

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

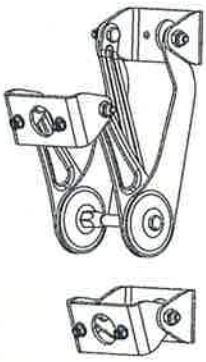
KATHREIN
SCALA DIVISION

800 10735V01

65° Single Band Panel Antenna, 6'



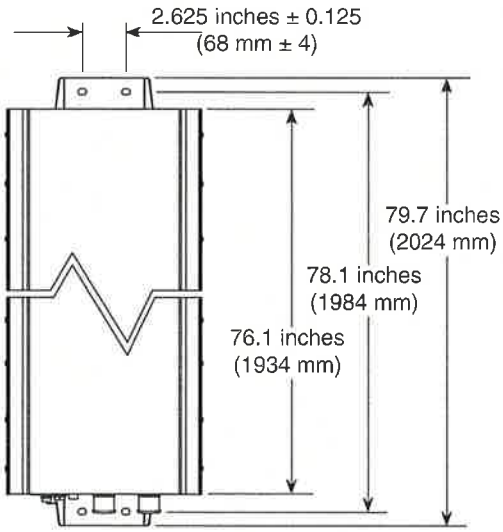
Mounting Brackets
for use with 2-point mount antennas
Mast dia. 2–4.5 inches (50–115 mm)
Weight: 4.4 lb (2 kg)



Mechanical Tilt Brackets
for use with 2-point mount antennas
Weight: 9.5 lb (4.3 kg)
(Model 850 10008)

Mechanical specifications:

Weight	30.9 lb (14 kg)	35.3 lb (16 kg) clamps included
Dimensions H x W x D	76.1 x 11.9 x 3.9 inches (1934 x 303 x 99 mm)	
Wind load Front/Side/Rear Mounting category	at 93 mph (150kph) 203 lbf / 70 lbf / 232 lbf (900 N / 310 N / 1030 N) H (Heavy)	
Wind survival rating*	150 mph (240 kph)	
Shipping dimensions	81.1 x 12.4 x 4.5 inches (2060 x 315 x 115 mm)	
Shipping weight	39.7 lb (18 kg)	
Mounting bracket	2-point hot-dip galvanized with stainless steel hardware for 2 to 4.5 inch (50 to 115 mm) OD masts.	

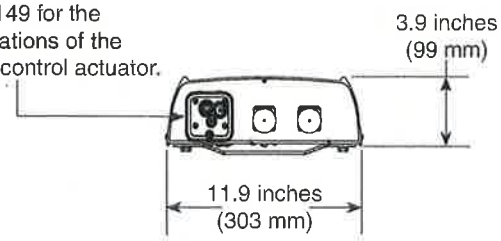


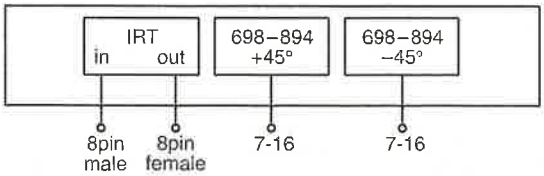
KATHREIN 860 10149

FC Tested To Comply With FCC Standards

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: Refer to part number 860 10149 for the specifications of the remote control actuator.





Order Information:

Model	Description
800 10735V01	Antenna with mounting bracket 0°–10° electrical downtilt
800 10735V01K	Antenna with mounting bracket and mechanical tilt bracket 0°–10° electrical downtilt

*Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

Amphenol ANTENNA SOLUTIONS

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

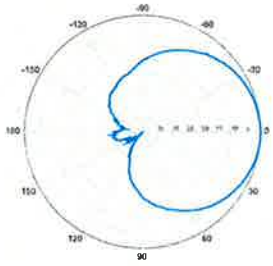
Replace "X" with desired electrical downtilt

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	< -25 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1842 x 154 x 105 mm		72.5 x 6.1 x 4.1 in
Depth with z-brackets	133 mm		5.2 in
Weight without mounting brackets	5.8 kg		12.8 lbs
Survival wind speed	> 201 km/hr		> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²		Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N		Front: 103 lbf Side: 68 lbf

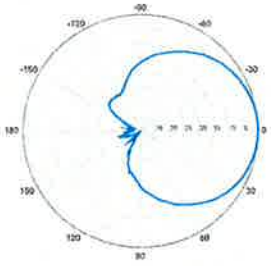
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		

BXA-171063-12CF-EDIN-X



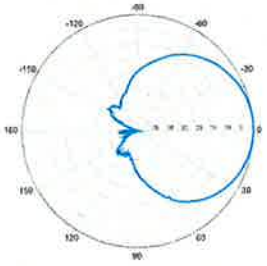
Horizontal | 1710-1880 MHz

BXA-171063-12CF-EDIN-X



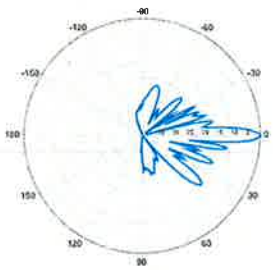
Horizontal | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



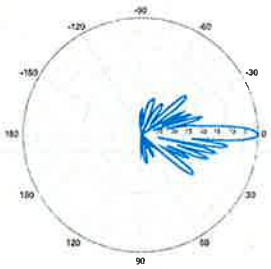
Horizontal | 1920-2170 MHz

BXA-171063-12CF-EDIN-0



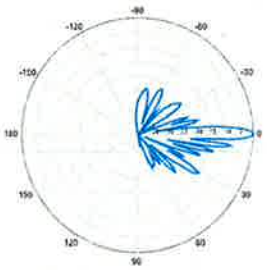
0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-0

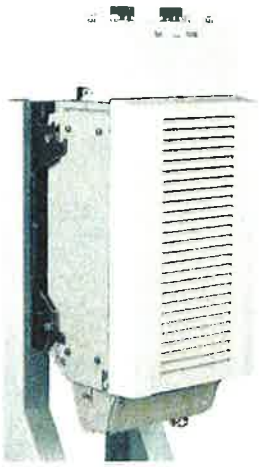


0° | Vertical | 1920-2170 MHz

Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



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

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

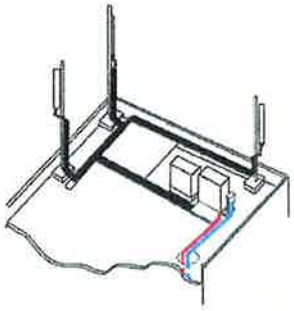
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.

Features

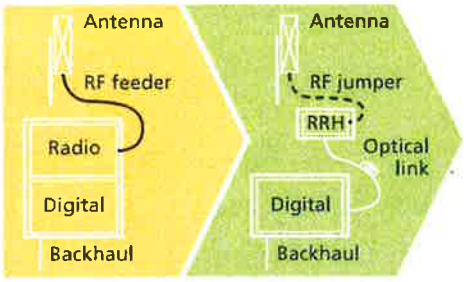
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

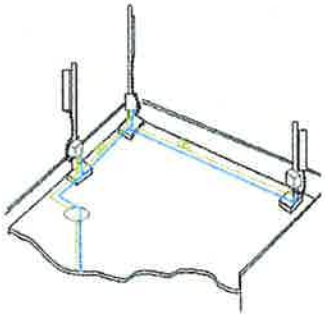
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
  - ¬ TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
  - ¬ One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
  - ¬ Single mode dual fiber (SM/DF)
- Multi-mode variant
  - ¬ Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

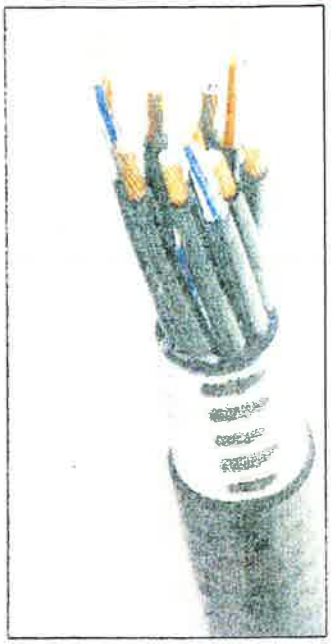


Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

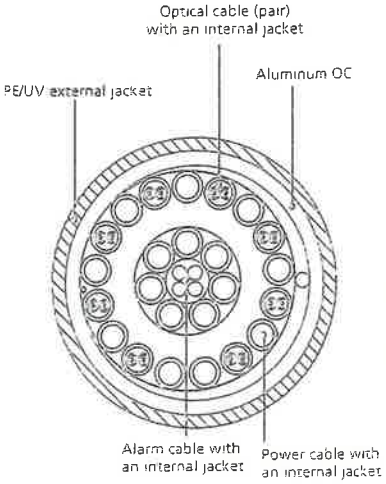


Figure 2: Construction Detail

- This data is provisional and subject to change

ATTACHMENT 2

Far Field Approximation
with downtilt variation

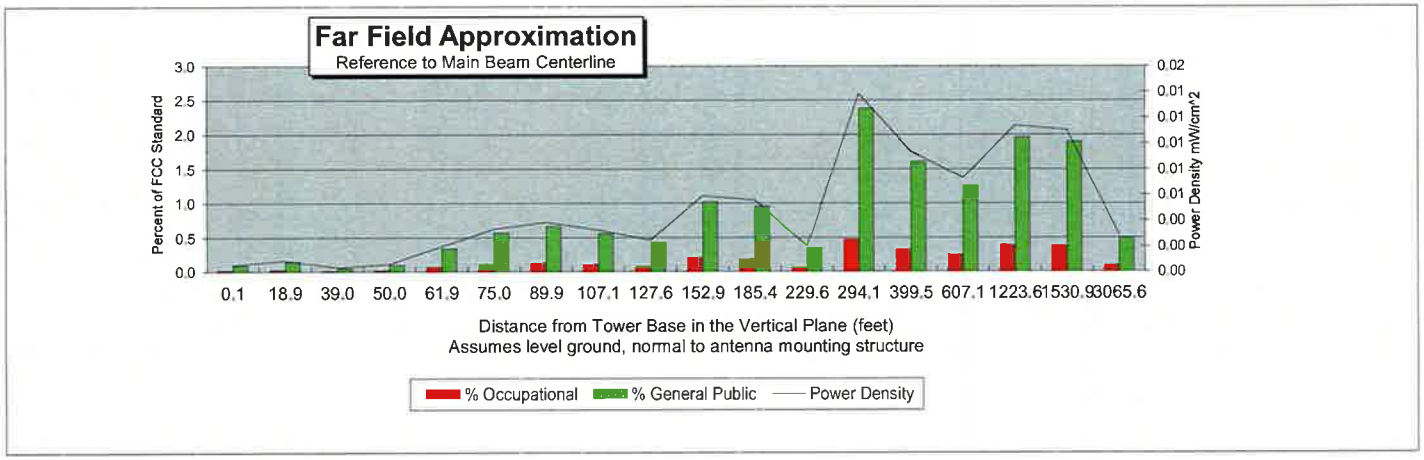
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	
Date:	03/18/14
Name:	Mark Brauer
File Name:	Mark Brauer, CT - FF Power

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**15.2**
Antenna Size (in.):	**48.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3740.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.3	0.3	0.4	0.4	0.1	
Percent of General Population Standard	0.1	0.1	0.1	0.1	0.3	0.6	0.7	0.6	0.4	1.0	1.0	0.3	2.4	1.6	1.3	2.0	1.9	0.5	

Antenna Type BXA-70063-4CF
Max% 2.38%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

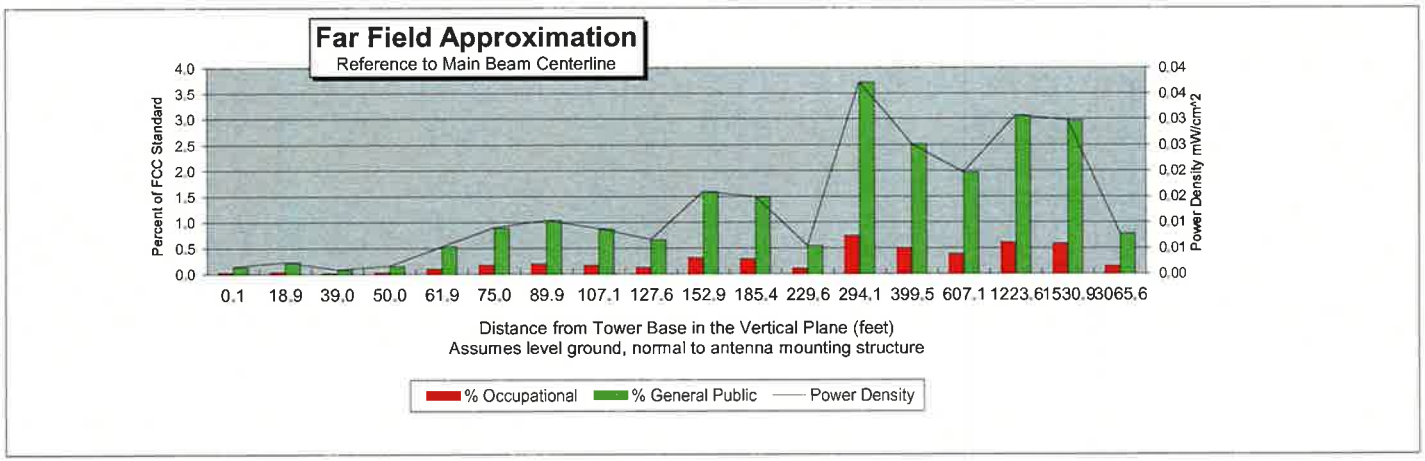
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	
Date:	03/18/14
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**18.2**
Antenna Size (in.):	**48.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**5053.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.04	0.03	0.02	0.03	0.03	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.7	0.5	0.4	0.6	0.6	0.2	
Percent of General Population Standard	0.1	0.2	0.1	0.2	0.5	0.9	1.0	0.9	0.7	1.6	1.5	0.5	3.7	2.5	2.0	3.1	3.0	0.8	

Antenna Type BXA-185060/8CF
Max% 3.72%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

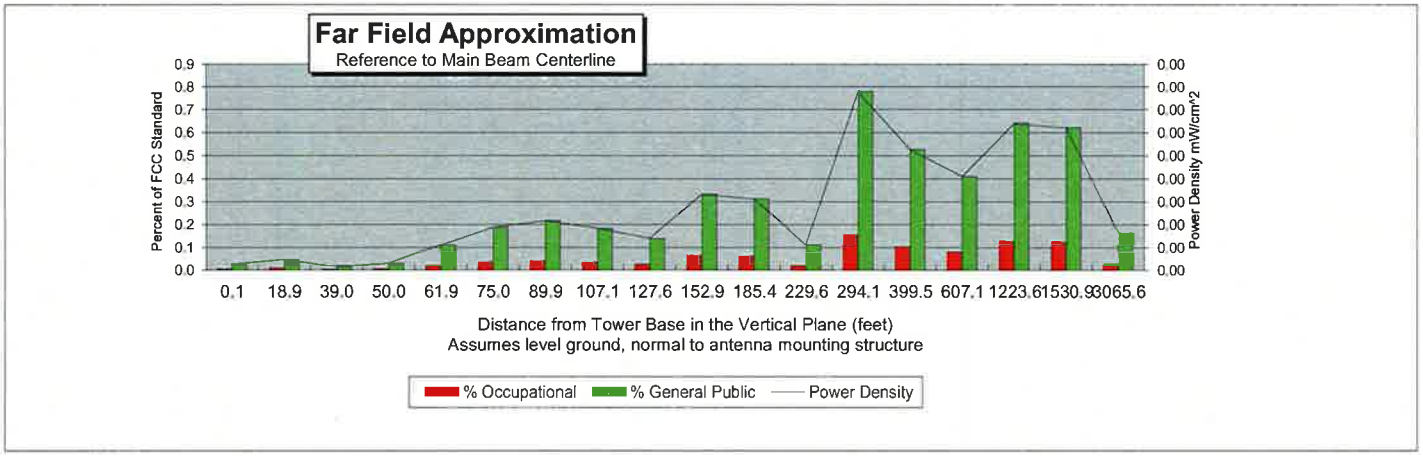
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	
Date:	03/18/14
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**746.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**15.2**
Antenna Size (in.):	**76.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1050.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.8	0.5	0.4	0.6	0.6	0.2	

Antenna Type 80010735V01
Max% 0.78%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

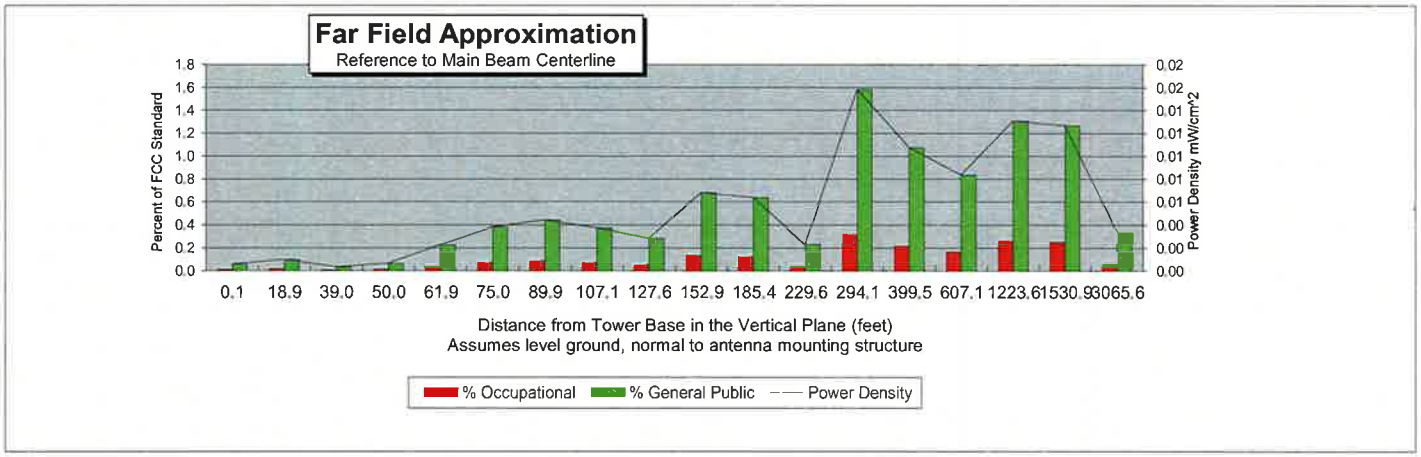
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	
Date:	03/18/14
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**2145.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**19.1**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1750.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.2	0.2	0.3	0.3	0.1
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	0.3	0.7	0.6	0.2	1.6	1.1	0.8	1.3	1.3	0.3

Antenna Type BXA-171063-12CF
Max% 1.59%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 3

February 10, 2014

Mr. Andrew Bazinet
Crown Castle
46 Broadway
Albany, NY 12204
(585) 899-3442

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

Subject:	**Structural Modification Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	New Britain 5, CT
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	East Farmington
	Crown Castle JDE Job Number:	247026
	Crown Castle Work Order Number:	691610
	Crown Castle Application Number:	201483 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	77969.011.01
Site Data:	**3 A Birdseye Road, Farmington, CT, Hartford County** **Latitude *41° 42' 56.94"*, Longitude *-72° 48' 37.42"*** **140 Foot - Monopole**	

Dear Mr. Bazinet,

B+T Group are pleased to submit this **"Structural Modification 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 603723, in accordance with application 201483, revision 1.

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

LC4.7: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2003 IBC; 2003 IRC (State Building Code, 2005 CT supplement) based upon a wind speed of 80 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:
B+T Engineering, Inc.

Braden Tabb, E.I.
Project Engineer

Chad E. Tuttle, P.E.
President

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft. monopole designed by Summit in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.This tower has been reinforced in 2008 & modified in 2012 and 2013 by B+T Group and those modifications are incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	110.0	1	Raycap	TME-DB-T16Z-8AB-0Z w/mount pipe	--	--	--
		1	tower mounts	Side Arm Mount [SO 102-1]			
108.0	109.0	1	Kathrein	800 10735V01	1	1 5/8	--
		3	Antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		3	Antel	BXA-171063-12CF-EDIN-2 w/ Mount Pipe			
		3	Alcatel lucent	RRH2X40-AWS			

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
139.0	139.0	3	RFS Celwave	APXV9ERR18-C-A20	3	1 1/4	2
		6	Decibel	DB980H90A-M	6	1 5/8	1
		1	--	Platform Mount [LP 601-1]			
137.0	137.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER	--	--	2
		3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
		1	--	Side Arm Mount [SO 102-3]			
129.0	130.0	3	Ericsson	RRUS-11	--	--	1
	129.0	1	--	Side Arm Mount [SO 102-3]			
128.0	130.0	3	Ericsson	RRUS-11	--	--	2
		1	Andrew	SBNH-1D6565C	2 1 9	3/4 3/8 7/8	1
		2	KMW Communications	AM-X-CD-16-65-00T-RET			
		3	Powerwave Technologies	7770.00			
		1	Raycap	DC6-48-60-18-8F			
	128.0	6	Powerwave Technologies	LGP21401			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	T-Arm Mount [TA 602-3]			
120.0	120.0	12	Swedcom	ALP 9212-N	12	1 5/8	1
		1	--	Platform Mount [LP 601-1]			
108.0	109.0	3	Antel	BXA-185060/8CFx2	12	1 5/8	1
		2	Antel	BXA-70063-6CF-EDIN-4			
		2	**Antel**	**BXA-70063/6CFx2**	--	--	**3**
		1	**Antel**	**BXA-70063/6CFx4**			
		6	**Antel**	**LPD-6513**			
	108.0	6	RFS Celwave	FD9R6004/2C-3L	--	--	1
		1	--	Platform Mount [LP 303-1]			
100.0	100.0	3	Ericsson	KRY 112 144/1	12	7/8	1
		3	Ericsson	KRY 112 89/5			
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20			
		1	--	Side Arm Mount [SO 102-3]			
90.0	90.0	3	Kathrein	742 213	6	7/8	1
		1	--	Pipe Mount [PM 601-3]			
70.0	72.0	2	Lucent	KS24019-L112A	2	5/16	1
	70.0	2	--	Side Arm Mount [SO 701-1]			
49.0	51.0	1	Lucent	KS24019-L112A	1	1/2	1
	49.0	1	--	Side Arm Mount [SO 701-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Information Not Available						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Revision #1	201483	CCI Sites
Tower Manufacturing Drawing	Summit Manufacturing, Date:11/03/1997	1615361	CCI Sites
Tower Modification Drawing/PMI	B&T Engineering, Project No.79807	Date:12/09/2008	CCI Sites
Tower Modification Drawing	B&T Engineering, Project No.77969.005	Date:07/10/2012	CCI Sites
Post Modification inspection	TEP, Project No:127152	3413367	CCI Sites
Tower Modification Drawings	B&T Engineering, Project No.77969.007.01	Date:03/04/2013	CCI Sites
Foundation Drawing	Summit Manufacturing, Job No.2933	1440555	CCI Sites
Geotech Report	FDH Engineering, Inc.	1531892	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 11/26/2013	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – LC4.7

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K).	% Capacity	Pass / Fail
L1	140 - 102.333	Pole	TP23.721x16x0.25	1	-8.154	906.684	98.4	Pass
L2	102.333 - 91.75	Pole	TP25.89x23.721x0.376	2	-9.405	1266.550	86.8	Pass
L3	91.75 - 85.333	Pole	TP26.706x24.724x0.422	3	-11.590	1716.051	91.8	Pass
L4	85.333 - 82.5	Pole	TP27.287x26.706x0.601	4	-12.152	2344.747	74.1	Pass
L5	82.5 - 77.1667	Pole	TP28.38x27.287x0.527	5	-13.245	2207.568	91.0	Pass
L6	77.1667 - 66.667	Pole	TP30.534x28.38x0.512	6	-15.710	2323.192	89.2	Pass
L7	66.667 - 60	Pole	TP31.901x30.534x0.508	7	-17.111	2243.412	95.1	Pass
L8	60 - 46.5	Pole	TP34.67x31.901x0.505	8	-19.248	2334.509	93.4	Pass
L9	46.5 - 44.25	Pole	TP34.506x33.122x0.554	9	-21.778	2658.668	96.6	Pass
L10	44.25 - 27.75	Pole	TP37.89x34.506x0.652	10	-26.557	3481.183	89.4	Pass
L11	27.75 - 24.083	Pole	TP38.642x37.89x0.645	11	-27.665	3516.534	90.7	Pass
L12	24.083 - 18.083	Pole	TP39.872x38.642x0.551	12	-29.565	2998.290	98.3	Pass
L13	18.083 - 0	Pole	TP43.58x39.872x0.626	13	-35.244	4100.215	98.0	Pass
							Summary	
						Pole (L1)	98.4	Pass
						RATING =	**98.4**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	96.1	Pass
1	Base Plate	Base	91.1	Pass
1	Base Foundation	Base	50.3	Pass

Structure Rating (max from all components) =	**98.4%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F

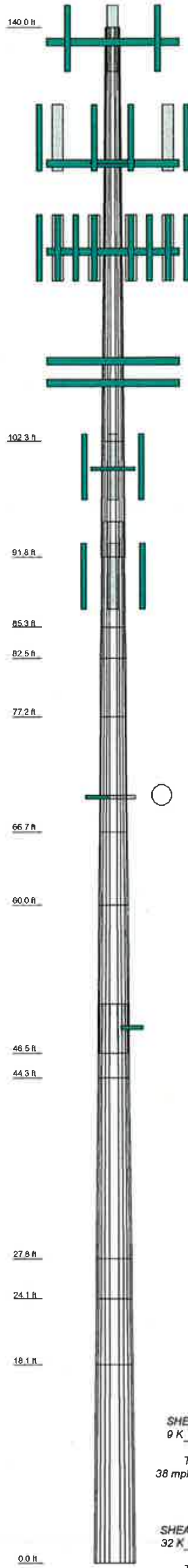
4.1) Recommendations

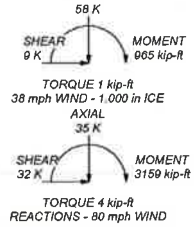
1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

APPENDIX A

tnxTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	
Length (ft)	37.667	10.583	9.667	2.833	5.333	10.500	6.667	13.500	6.750	16.500	3.667	6.000	18.083	
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	
Thickness (in)	0.250	0.376	0.422	0.601	0.527	0.512	0.508	0.505	0.564	0.652	0.645	0.551	0.626	
Socket Length (ft)		3.250						4.500						
Top Dia (in)	16.000	23.721	24.724	26.706	27.287	28.380	30.534	31.901	33.122	34.506	37.890	38.642	39.872	
Bot Dia (in)	23.721	25.890	26.706	27.287	28.380	30.534	31.901	34.670	34.506	37.890	38.642	39.872	43.580	
Grade	A607-60	52.584702ksi	60.01407ksi	58.810582ksi	58.450152ksi	58.742734ksi	54.670493ksi	53.993176ksi	54.865969ksi	55.708333ksi	55.701895ksi	53.739219ksi	59.218199ksi	
Weight (K)	2.0	1.0	1.2	0.5	0.9	1.9	1.1	2.6	1.3	4.0	0.9	1.6	4.9	23.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90A-M w/ Mount Pipe (TBR)	139	Side Arm Mount [SO 102-1] (P)	110
(2) DB980H90A-M w/ Mount Pipe (TBR)	139	BXA-185060/8CFx2 w/ Mount Pipe (E)	108
(2) DB980H90A-M w/ Mount Pipe (TBR)	139	BXA-185060/8CFx2 w/ Mount Pipe (E)	108
APXV9ERR18-C-A20 w/ Mount Pipe (R)	139	BXA-185060/8CFx2 w/ Mount Pipe (E)	108
APXV9ERR18-C-A20 w/ Mount Pipe (R)	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	108
APXV9ERR18-C-A20 w/ Mount Pipe (R)	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (P)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (P)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (P)	108
Platform Mount [LP 601-1] (E)	139	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	108
PCS 1900MHz 4x45W-65MHz (R)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	108
PCS 1900MHz 4x45W-65MHz (R)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	108
PCS 1900MHz 4x45W-65MHz (R)	137	800 10735V01 w/ Mount Pipe (P)	108
800MHz 2X50W RRH W/FILTER (R)	137	RRH2x40-AWS (P)	108
800MHz 2X50W RRH W/FILTER (R)	137	RRH2x40-AWS (P)	108
800MHz 2X50W RRH W/FILTER (R)	137	RRH2x40-AWS (P)	108
Side Arm Mount [SO 102-3] (R)	137	(2) FD9R6004/2C-3L (E)	108
(2) RRUS-11 (E)	128	(2) FD9R6004/2C-3L (E)	108
(2) RRUS-11 (E)	128	(2) FD9R6004/2C-3L (E)	108
(2) RRUS-11 (E)	128	Platform Mount [LP 304-1] (E)	108
Side Arm Mount [SO 102-3] (E)	128	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
7770.00 w/ Mount Pipe (E)	128	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
7770.00 w/ Mount Pipe (E)	128	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
7770.00 w/ Mount Pipe (E)	128	KRY 112 144/1 (E)	100
(2) LGP21401 (E)	128	KRY 112 144/1 (E)	100
(2) LGP21401 (E)	128	KRY 112 144/1 (E)	100
(2) LGP21401 (E)	128	KRY 112 89/5 (E)	100
SBNH-1D6565C w/ Mount Pipe (E)	128	KRY 112 89/5 (E)	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	128	KRY 112 89/5 (E)	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	128	Side Arm Mount [SO 102-3] (E)	100
DC6-48-60-18-8F (E)	128	742 213 w/ Mount Pipe (E)	90
RRUS-11 (R)	128	742 213 w/ Mount Pipe (E)	90
RRUS-11 (R)	128	742 213 w/ Mount Pipe (E)	90
RRUS-11 (R)	128	Pipe Mount [PM 601-3] (E)	90
6' x 2" Mount Pipe (E)	128	KS24019-L112A (E)	70
6' x 2" Mount Pipe (E)	128	KS24019-L112A (E)	70
6' x 2" Mount Pipe (E)	128	Side Arm Mount [SO 701-1] (E)	70
T-Arm Mount [TA 602-3] (E)	128	Side Arm Mount [SO 701-1] (E)	70
(4) ALP 9212-N w/ Mount Pipe (E)	120	KS24019-L112A (E)	49
(4) ALP 9212-N w/ Mount Pipe (E)	120	Side Arm Mount [SO 701-1] (E)	49
(4) ALP 9212-N w/ Mount Pipe (E)	120		
Platform Mount [LP 601-1] (E)	120		
TME-DB-T1B2-6AB-0Z w/mount pipe (P)	110		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	53.993176ksi	54 ksi	69 ksi
52.584702ksi	53 ksi	68 ksi	54.865969ksi	55 ksi	70 ksi
60.01407ksi	60 ksi	75 ksi	55.708333ksi	56 ksi	71 ksi
56.810582ksi	57 ksi	72 ksi	55.701895ksi	56 ksi	71 ksi
58.450152ksi	58 ksi	73 ksi	53.739219ksi	54 ksi	69 ksi
58.742734ksi	59 ksi	74 ksi	59.218199ksi	59 ksi	74 ksi
54.670493ksi	55 ksi	70 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.4%

BT Engineering
1717 S. Boulder, Ste 300
Tulsa, OK 74132
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

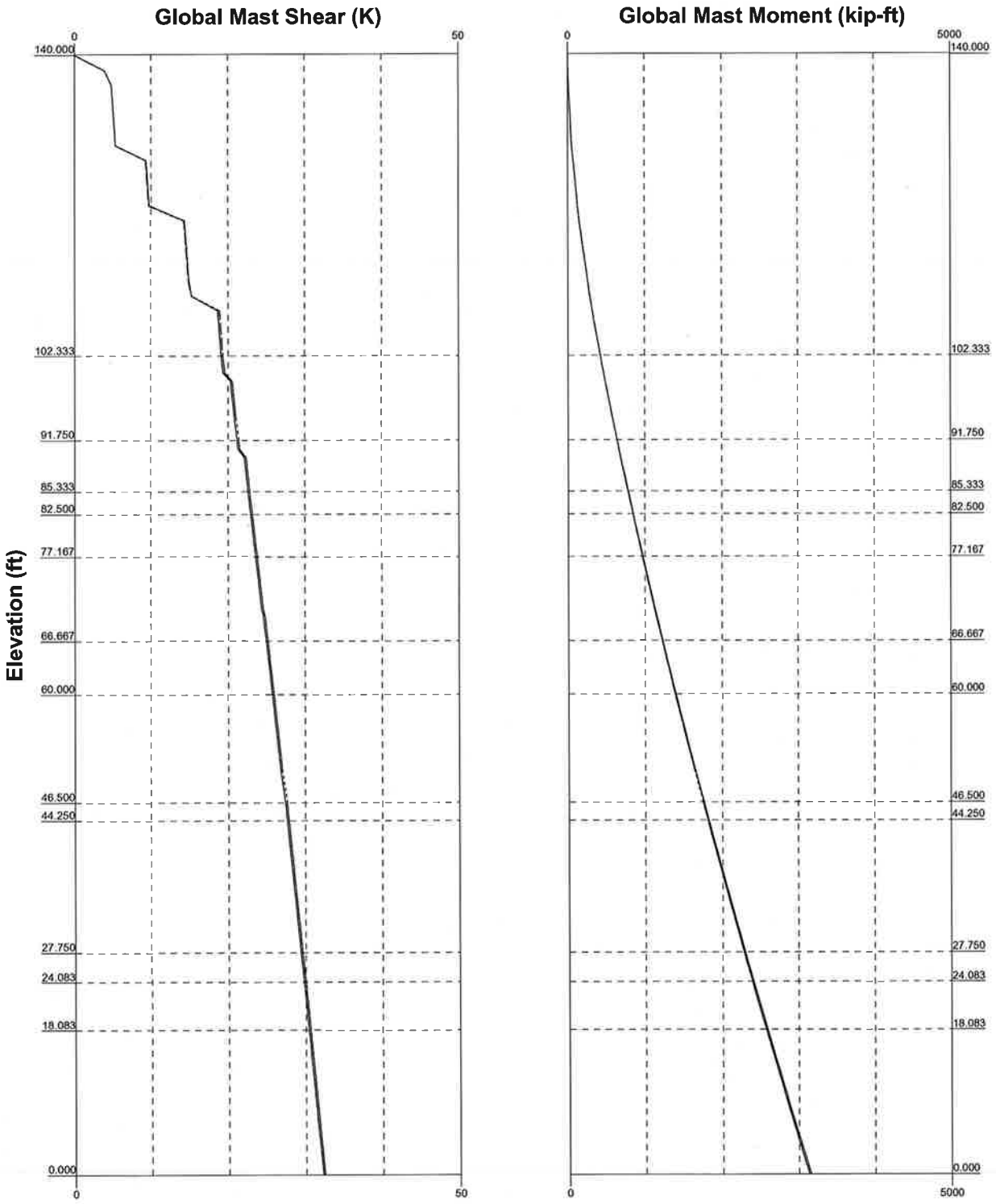
Job: 77969.011.001 - East Farmington, CT (BU# 87633			
Project: 140' Summit Monopole			
Client: Crown Castle	Drawn by: B. Tabb	App'd:	
Code: TIA/EIA-222-F	Date: 02/10/14	Scale: NTS	
Path:		Dwg No. E-1	

TIA/EIA-222-F - 80 mph/38 mph 1.000 in Ice

Maximum Values

Vx ---------- Vz

Mx ---------- Mz



BT Engineering
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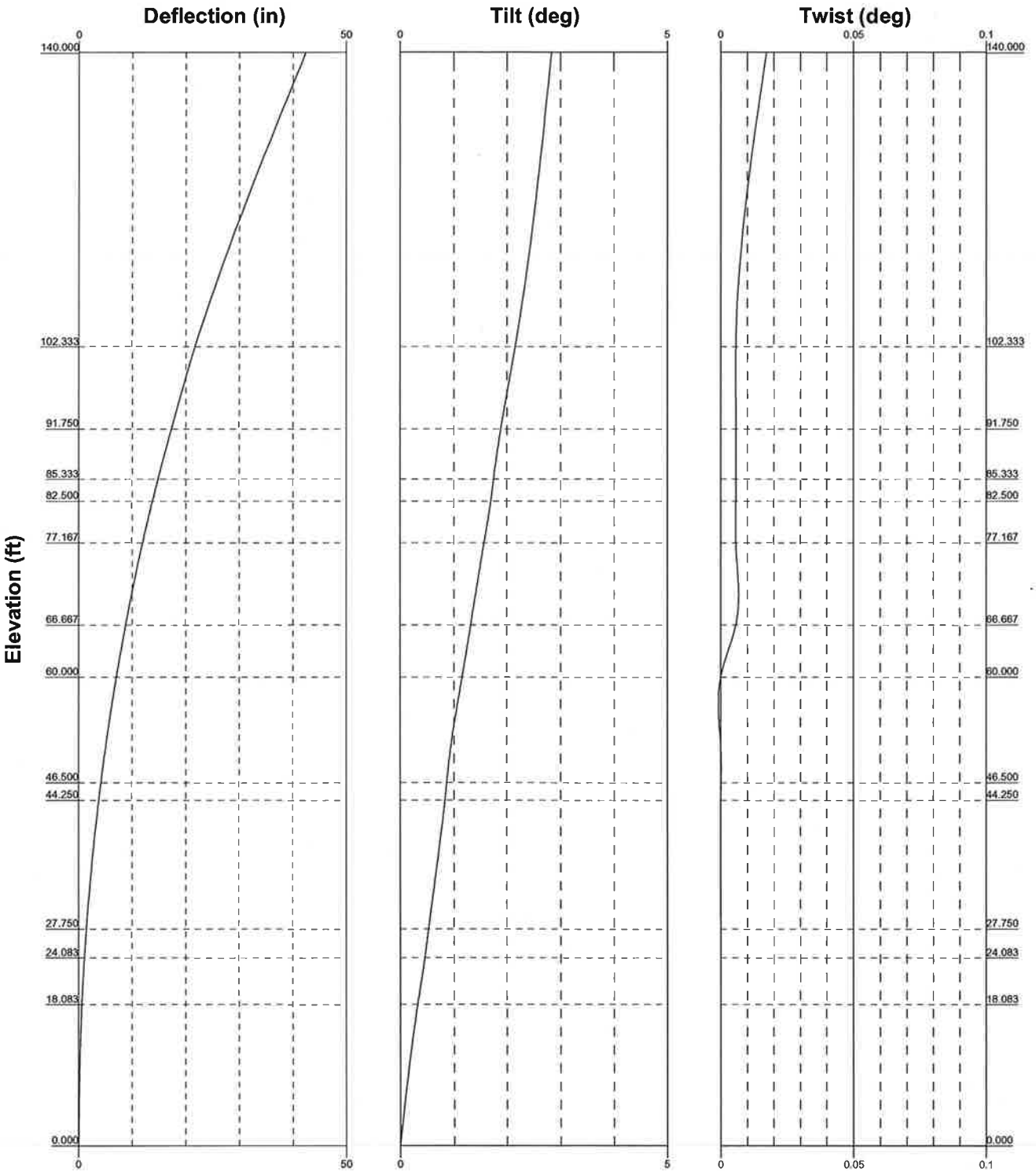
Tulsa, OK 74132
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: 77969 .011.001 - East Farmington, CT (BU# 87633			
Project: 140' Summit Monopole			
Client: Crown Castle	Drawn by: B. Tabb	App'd:	
Code: TIA/EIA-222-F	Date: 02/10/14	Scale: NTS	
Path:		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph **Maximum Values**

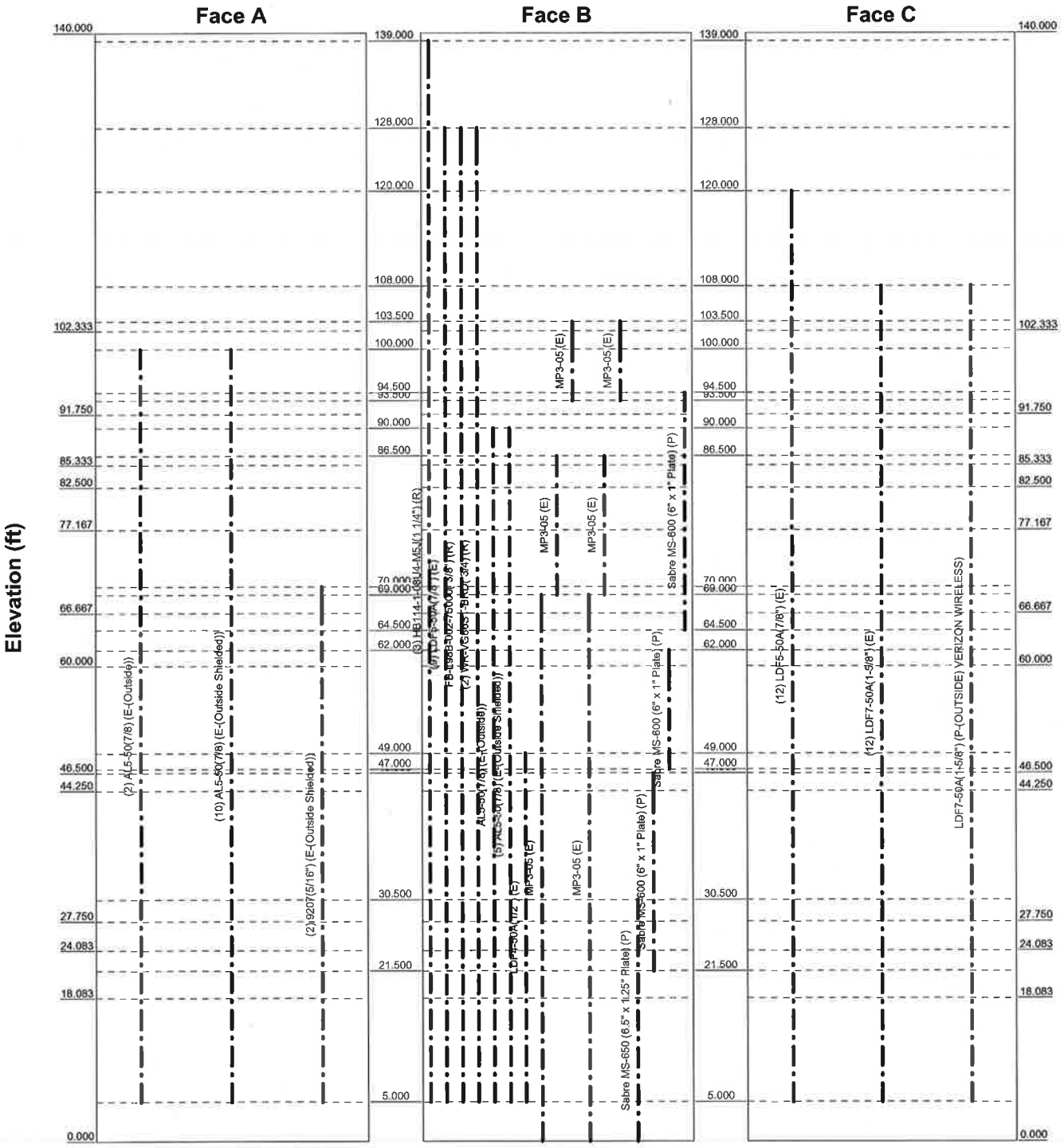


BT Engineering
1717 S. Boulder, Ste 300
Tulsa, OK 74132
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: *77969 .011.001 - East Farmington, CT (BU# 87633*			
Project: *140' Summit Monopole*			
Client: Crown Castle	Drawn by: B. Tabb	App'd:	
Code: TIA/EIA-222-F	Date: 02/10/14	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 140'

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



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Job: 77969 .011.001 - East Farmington, CT (BU# 87633			
Project: 140' Summit Monopole			
Client: Crown Castle	Drawn by: B. Tabb	App'd:	
Code: TIA/EIA-222-F	Date: 02/10/14	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
TOWER RATING: %.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

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	140.000-102.333	37.667	0.000	12	16.000	23.721	0.250	1.000	A607-60 (60 ksi)
L2	102.333-91.750	10.583	3.250	12	23.721	25.890	0.376	1.506	52.584702ksi (53 ksi)
L3	91.750-85.333	9.667	0.000	12	24.724	26.706	0.422	1.690	60.01407ksi (60 ksi)
L4	85.333-82.500	2.833	0.000	12	26.706	27.287	0.601	2.402	56.810582ksi (57 ksi)
L5	82.500-77.167	5.333	0.000	12	27.287	28.380	0.527	2.106	58.450152ksi (58 ksi)
L6	77.167-66.667	10.500	0.000	12	28.380	30.534	0.512	2.046	58.742734ksi (59 ksi)
L7	66.667-60.000	6.667	0.000	12	30.534	31.901	0.508	2.030	54.670493ksi (55 ksi)
L8	60.000-46.500	13.500	4.500	12	31.901	34.670	0.505	2.020	53.993176ksi (54 ksi)
L9	46.500-44.250	6.750	0.000	12	33.122	34.506	0.554	2.217	54.865969ksi (55 ksi)
L10	44.250-27.750	16.500	0.000	12	34.506	37.890	0.652	2.606	55.708333ksi (56 ksi)
L11	27.750-24.083	3.667	0.000	12	37.890	38.642	0.645	2.581	55.701895ksi (56 ksi)
L12	24.083-18.083	6.000	0.000	12	38.642	39.872	0.551	2.204	53.739219ksi (54 ksi)
L13	18.083-0.000	18.083		12	39.872	43.580	0.626	2.504	59.216199ksi (59 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	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	24.558	18.894	1328.505	8.403	12.287	108.120	2691.912	9.299	5.687	22.749
L2	24.558	28.293	1968.030	8.357	12.287	160.167	3987.763	13.925	5.348	14.21
	26.803	30.922	2569.219	9.134	13.411	191.575	5205.935	15.219	5.930	15.754
L3	26.286	33.056	2491.704	8.700	12.807	194.559	5048.869	16.269	5.494	13.005
	27.648	35.752	3152.414	9.409	13.834	227.881	6387.646	17.596	6.025	14.263
L4	27.648	50.481	4391.062	9.346	13.834	317.420	8897.481	24.845	5.548	9.238
	28.249	51.604	4690.723	9.554	14.134	331.865	9504.677	25.398	5.703	9.497
L5	28.249	45.369	4146.813	9.580	14.134	293.384	8402.567	22.329	5.902	11.209
	29.381	47.222	4676.188	9.972	14.701	318.090	9475.225	23.241	6.195	11.766
L6	29.381	45.901	4550.244	9.977	14.701	309.523	9220.027	22.591	6.235	12.189
	31.611	49.448	5688.740	10.748	15.816	359.674	11526.930	24.337	6.812	13.318
L7	31.611	49.072	5646.975	10.749	15.816	357.033	11442.303	24.152	6.823	13.442
	33.026	51.307	6454.178	11.239	16.525	390.577	13077.914	25.252	7.189	14.165
L8	33.026	51.058	6423.885	11.240	16.525	388.744	13016.533	25.129	7.196	14.248
	35.893	55.561	8277.854	12.231	17.959	460.929	16773.176	27.345	7.938	15.717
L9	35.246	58.117	7868.028	11.659	17.157	458.585	15942.758	28.603	7.391	13.337
	35.723	60.587	8914.451	12.155	17.874	498.733	18063.094	29.819	7.762	14.007
L10	35.723	71.032	10391.436	12.120	17.874	581.365	21055.866	34.960	7.501	11.512
	39.226	78.131	13828.786	13.331	19.627	704.586	28020.869	38.454	8.408	12.904
L11	39.226	77.372	13699.075	13.334	19.627	697.977	27758.040	38.080	8.425	13.06
	40.005	78.934	14545.675	13.603	20.016	726.690	29473.482	38.849	8.627	13.372
L12	40.005	67.576	12514.610	13.636	20.016	625.220	25357.993	33.259	8.879	16.116
	41.278	69.759	13766.893	14.077	20.654	666.560	27895.458	34.333	9.209	16.715
L13	41.278	79.100	15550.809	14.050	20.654	752.932	31510.156	38.931	9.008	14.392
	45.117	86.574	20388.247	15.378	22.574	903.156	41312.116	42.609	10.002	15.979

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
L1 140.000-102.333				1	1	1		
L2 102.333-91.750				1	1	0.956127		
L3 91.750-85.333				1	1	1.07562		
L4 85.333-82.500				1	1	0.926259		
L5 82.500-77.167				1	1	1.03548		
L6 77.167-66.667				1	1	1.09168		
L7 66.667-60.000				1	1	0.947739		
L8 60.000-46.500				1	1	1.04477		
L9 46.500-44.250				1	1	0.957484		
L10 44.250-27.750				1	1	0.948284		
L11 27.750-24.083				1	1	0.950131		
L12 24.083-18.083				1	1	1.1218		

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
L13 18.083-0.000				1	1	0.955568		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
HB114-1-08U4-M5J(1 1/4") (R)	B	No	Inside Pole	139.000 - 5.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
@ LDF5-50A(7/8") (E)	B	No	Inside Pole	128.000 - 5.000	9	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
FB-L98B-002-75000(3/8") (R)	B	No	Inside Pole	128.000 - 5.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (R)	B	No	Inside Pole	128.000 - 5.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
@ LDF5-50A(7/8") (E)	C	No	Inside Pole	120.000 - 5.000	12	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
@ LDF7-50A(1-5/8") (E)	C	No	Inside Pole	108.000 - 5.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF7-50A(1-5/8") (P-(OUTSIDE) VERIZON WIRELESS)	C	No	CaAa (Out Of Face)	108.000 - 5.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
@ AL5-50(7/8) (E-(Outside))	A	No	CaAa (Out Of Face)	100.000 - 5.000	2	No Ice	0.110	0.000
						1/2" Ice	0.210	0.001
						1" Ice	0.310	0.003
						2" Ice	0.510	0.008
						4" Ice	0.910	0.025
AL5-50(7/8) (E-(Outside Shielded))	A	No	CaAa (Out Of Face)	100.000 - 5.000	10	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
						4" Ice	0.000	0.025
@								
AL5-50(7/8)	B	No	CaAa (Out Of	90.000 - 5.000	1	No Ice	0.110	0.000
(E-(Outside))			Face)			1/2" Ice	0.210	0.001
						1" Ice	0.310	0.003
						2" Ice	0.510	0.008
						4" Ice	0.910	0.025
AL5-50(7/8)	B	No	CaAa (Out Of	90.000 - 5.000	5	No Ice	0.000	0.000
(E-(Outside Shielded))			Face)			1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008
						4" Ice	0.000	0.025
@								
9207(5/16")	A	No	CaAa (Out Of	70.000 - 5.000	2	No Ice	0.000	0.001
(E-(Outside Shielded))			Face)			1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
@								
LDF4-50A(1/2")	B	No	Inside Pole	49.000 - 5.000	1	No Ice	0.000	0.000
(E)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
@								
MP3-05	B	No	CaAa (Out Of	69.000 - 0.000	1	No Ice	0.348	0.000
(E)			Face)			1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000
						4" Ice	1.015	0.000
MP3-05	B	No	CaAa (Out Of	86.500 - 69.000	1	No Ice	0.348	0.000
(E)			Face)			1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000
						4" Ice	1.015	0.000
MP3-05	B	No	CaAa (Out Of	103.500 - 93.500	1	No Ice	0.348	0.000
(E)			Face)			1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000
						4" Ice	1.015	0.000
@								
MP3-05	B	No	CaAa (Out Of	69.000 - 0.000	1	No Ice	0.000	0.000
(E)			Face)			1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
MP3-05	B	No	CaAa (Out Of	86.500 - 69.000	1	No Ice	0.000	0.000
(E)			Face)			1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
MP3-05	B	No	CaAa (Out Of	103.500 - 93.500	1	No Ice	0.000	0.000
(E)			Face)			1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
@								
Sabre MS-650 (6.5" x	B	No	CaAa (Out Of	30.500 - 0.000	1	No Ice	0.208	0.000
1.25" Plate)			Face)			1/2" Ice	0.292	0.000
(P)						1" Ice	0.375	0.000
						2" Ice	0.542	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						4" Ice	0.875	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	46.500 - 21.500	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	62.000 - 47.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	94.500 - 64.500	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.000-102.333	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.407	0.227
		C	0.000	0.000	0.000	1.122	0.130
L2	102.333-91.750	A	0.000	0.000	0.000	1.815	0.026
		B	0.000	0.000	0.000	3.535	0.079
		C	0.000	0.000	0.000	2.095	0.155
L3	91.750-85.333	A	0.000	0.000	0.000	1.412	0.020
		B	0.000	0.000	0.000	1.989	0.055
		C	0.000	0.000	0.000	1.271	0.094
L4	85.333-82.500	A	0.000	0.000	0.000	0.623	0.009
		B	0.000	0.000	0.000	1.771	0.026
		C	0.000	0.000	0.000	0.561	0.041
L5	82.500-77.167	A	0.000	0.000	0.000	1.173	0.017
		B	0.000	0.000	0.000	3.333	0.048
		C	0.000	0.000	0.000	1.056	0.078
L6	77.167-66.667	A	0.000	0.000	0.000	2.310	0.037
		B	0.000	0.000	0.000	6.562	0.095
		C	0.000	0.000	0.000	2.079	0.154
L7	66.667-60.000	A	0.000	0.000	0.000	1.467	0.029
		B	0.000	0.000	0.000	3.750	0.060
		C	0.000	0.000	0.000	1.320	0.097
L8	60.000-46.500	A	0.000	0.000	0.000	2.970	0.058
		B	0.000	0.000	0.000	8.354	0.122
		C	0.000	0.000	0.000	2.673	0.197
L9	46.500-44.250	A	0.000	0.000	0.000	0.495	0.010
		B	0.000	0.000	0.000	1.406	0.021
		C	0.000	0.000	0.000	0.446	0.033
L10	44.250-27.750	A	0.000	0.000	0.000	3.630	0.071
		B	0.000	0.000	0.000	10.885	0.151
		C	0.000	0.000	0.000	3.267	0.241
L11	27.750-24.083	A	0.000	0.000	0.000	0.807	0.016
		B	0.000	0.000	0.000	3.056	0.034
		C	0.000	0.000	0.000	0.726	0.054
L12	24.083-18.083	A	0.000	0.000	0.000	1.320	0.026
		B	0.000	0.000	0.000	4.431	0.055
		C	0.000	0.000	0.000	1.188	0.088

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L13	18.083-0.000	A	0.000	0.000	0.000	2.878	0.057
		B	0.000	0.000	0.000	11.505	0.120
		C	0.000	0.000	0.000	2.590	0.191

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.000-102.333	A	1.168	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.634	0.227
		C		0.000	0.000	0.000	2.446	0.157
L2	102.333-91.750	A	1.138	0.000	0.000	0.000	5.571	0.348
		B		0.000	0.000	0.000	5.732	0.079
		C		0.000	0.000	0.000	4.504	0.202
L3	91.750-85.333	A	1.126	0.000	0.000	0.000	4.333	0.271
		B		0.000	0.000	0.000	4.490	0.146
		C		0.000	0.000	0.000	2.731	0.123
L4	85.333-82.500	A	1.119	0.000	0.000	0.000	1.891	0.116
		B		0.000	0.000	0.000	3.461	0.079
		C		0.000	0.000	0.000	1.195	0.054
L5	82.500-77.167	A	1.112	0.000	0.000	0.000	3.545	0.217
		B		0.000	0.000	0.000	6.496	0.148
		C		0.000	0.000	0.000	2.242	0.101
L6	77.167-66.667	A	1.098	0.000	0.000	0.000	6.921	0.435
		B		0.000	0.000	0.000	12.710	0.287
		C		0.000	0.000	0.000	4.384	0.198
L7	66.667-60.000	A	1.081	0.000	0.000	0.000	4.350	0.293
		B		0.000	0.000	0.000	7.145	0.179
		C		0.000	0.000	0.000	2.762	0.125
L8	60.000-46.500	A	1.059	0.000	0.000	0.000	8.688	0.572
		B		0.000	0.000	0.000	15.890	0.354
		C		0.000	0.000	0.000	5.532	0.251
L9	46.500-44.250	A	1.039	0.000	0.000	0.000	1.448	0.095
		B		0.000	0.000	0.000	2.677	0.059
		C		0.000	0.000	0.000	0.922	0.042
L10	44.250-27.750	A	1.010	0.000	0.000	0.000	10.296	0.644
		B		0.000	0.000	0.000	20.237	0.410
		C		0.000	0.000	0.000	6.600	0.302
L11	27.750-24.083	A	1.000	0.000	0.000	0.000	2.274	0.141
		B		0.000	0.000	0.000	5.623	0.090
		C		0.000	0.000	0.000	1.459	0.067
L12	24.083-18.083	A	1.000	0.000	0.000	0.000	3.720	0.230
		B		0.000	0.000	0.000	8.061	0.147
		C		0.000	0.000	0.000	2.388	0.110
L13	18.083-0.000	A	1.000	0.000	0.000	0.000	8.111	0.502
		B		0.000	0.000	0.000	20.150	0.321
		C		0.000	0.000	0.000	5.207	0.239

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	140.000-102.333	-0.028	0.035	-0.062	0.061
L2	102.333-91.750	0.131	0.104	0.083	-0.040
L3	91.750-85.333	0.111	0.039	0.188	-0.087
L4	85.333-82.500	0.379	0.196	0.492	0.110
L5	82.500-77.167	0.383	0.198	0.500	0.112
L6	77.167-66.667	0.389	0.202	0.513	0.116
L7	66.667-60.000	0.344	0.175	0.451	0.072
L8	60.000-46.500	0.398	0.206	0.533	0.120
L9	46.500-44.250	0.406	0.210	0.549	0.127
L10	44.250-27.750	0.443	0.232	0.598	0.159
L11	27.750-24.083	0.593	0.319	0.796	0.280
L12	24.083-18.083	0.518	0.275	0.692	0.212
L13	18.083-0.000	0.505	0.273	0.680	0.242

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB980H90A-M w/ Mount Pipe (TBR)	A	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.066 0.109 0.216 0.549
(2) DB980H90A-M w/ Mount Pipe (TBR)	B	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.066 0.109 0.216 0.549
(2) DB980H90A-M w/ Mount Pipe (TBR)	C	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.066 0.109 0.216 0.549
APXV9ERR18-C-A20 w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXV9ERR18-C-A20 w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXV9ERR18-C-A20 w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
(3) 5' x 2' Pipe Mount	A	From Leg	4.000		0.000	139.000	No Ice	1.188	1.188	0.018

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
(3) 5' x 2' Pipe Mount	B	From Leg	4.000	0.000	139.000	No Ice	1.188	1.188	0.018
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
(3) 5' x 2' Pipe Mount	C	From Leg	4.000	0.000	139.000	No Ice	1.188	1.188	0.018
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
Platform Mount [LP 601-1]	C	None		0.000	139.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
@									
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.000	0.000	137.000	No Ice	2.709	2.611	0.060
(R)			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.000	0.000	137.000	No Ice	2.709	2.611	0.060
(R)			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000	0.000	137.000	No Ice	2.709	2.611	0.060
(R)			0.000			1/2" Ice	2.948	2.847	0.083
			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
800MHz 2X50W RRH W/FILTER	A	From Leg	4.000	0.000	137.000	No Ice	2.401	2.254	0.064
(R)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	B	From Leg	4.000	0.000	137.000	No Ice	2.401	2.254	0.064
(R)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	C	From Leg	4.000	0.000	137.000	No Ice	2.401	2.254	0.064
(R)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
Side Arm Mount [SO 102-3)	C	None		0.000	137.000	No Ice	3.000	3.000	0.081
(R)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
@									
(2) RRUS-11	A	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS-11	B	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS-11	C	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
Side Arm Mount [SO 102-3]	C	None		0.000	128.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
@									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) LGP21401	A	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	B	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	C	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.000	0.000	128.000	No Ice	11.644	9.842	0.094
(E)			0.000			1/2" Ice	12.365	11.366	0.183
			2.000			1" Ice	13.095	12.914	0.283
						2" Ice	14.553	15.267	0.516
						4" Ice	17.825	20.139	1.160
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000	0.000	128.000	No Ice	8.498	6.304	0.074
			0.000			1/2" Ice	9.149	7.479	0.139

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET	C	From Leg	4.000	0.000	128.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
DC6-48-60-18-8F	A	From Leg	4.000	0.000	128.000	No Ice	2.567	4.317	0.019
(E)			0.000			1/2" Ice	2.798	4.596	0.050
			2.000			1" Ice	3.038	4.885	0.085
						2" Ice	3.543	5.488	0.167
						4" Ice	4.658	6.797	0.383
RRUS-11	A	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048
(R)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	B	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048
(R)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	2.000	0.000	128.000	No Ice	3.249	1.373	0.048
(R)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	128.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	128.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	128.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
T-Arm Mount [TA 602-3]	C	None		0.000	128.000	No Ice	11.590	11.590	0.774
(E)						1/2" Ice	15.440	15.440	0.990
						1" Ice	19.290	19.290	1.206
						2" Ice	26.990	26.990	1.639
						4" Ice	42.390	42.390	2.503
@									
(4) ALP 9212-N w/ Mount	A	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
Pipe			0.000			1/2" Ice	6.505	7.833	0.096
(E)			0.000			1" Ice	6.992	8.588	0.162
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount	B	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
Pipe			0.000			1/2" Ice	6.505	7.833	0.096
(E)			0.000			1" Ice	6.992	8.588	0.162

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	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	120.000	No Ice 1/2" Ice	6.021 6.505	7.050 7.833	0.037 0.096
(E)			0.000			1" Ice	6.992	8.588	0.162
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
Platform Mount [LP 601-1]	C	None		0.000	120.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
@									
TME-DB-T16Z-8AB-0Z w/mount pipe	A	From Leg	4.000 0.000	0.000	110.000	No Ice 1/2" Ice	5.660 5.997	2.752 3.126	0.053 0.095
(P)			0.000			1" Ice	6.344	3.521	0.142
						2" Ice	7.075	4.417	0.254
						4" Ice	8.662	6.448	0.561
Side Arm Mount [SO 102-1]	C	None		0.000	110.000	No Ice	1.500	1.500	0.025
(P)						1/2" Ice	1.740	1.750	0.035
						1" Ice	1.980	2.000	0.045
						2" Ice	2.460	2.500	0.065
						4" Ice	3.420	3.500	0.105
@									
BXA-185060/8CFx2 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	3.201 3.579	3.020 3.639	0.028 0.059
(E)			1.000			1" Ice	3.986	4.261	0.095
						2" Ice	4.879	5.556	0.187
						4" Ice	6.800	8.457	0.475
BXA-185060/8CFx2 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	3.201 3.579	3.020 3.639	0.028 0.059
(E)			1.000			1" Ice	3.986	4.261	0.095
						2" Ice	4.879	5.556	0.187
						4" Ice	6.800	8.457	0.475
BXA-185060/8CFx2 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	3.201 3.579	3.020 3.639	0.028 0.059
(E)			1.000			1" Ice	3.986	4.261	0.095
						2" Ice	4.879	5.556	0.187
						4" Ice	6.800	8.457	0.475
BXA-70063-6CF-EDIN-4 w/Mount Pipe	A	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	7.751 8.295	5.180 6.114	0.039 0.095
(E)			1.000			1" Ice	8.846	6.924	0.159
						2" Ice	9.974	8.593	0.313
						4" Ice	12.335	12.132	0.754
BXA-70063-6CF-EDIN-4 w/Mount Pipe	B	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	7.751 8.295	5.180 6.114	0.039 0.095
(E)			1.000			1" Ice	8.846	6.924	0.159
						2" Ice	9.974	8.593	0.313
						4" Ice	12.335	12.132	0.754
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	5.399 5.844	3.693 4.295	0.028 0.070
(P)			1.000			1" Ice	6.299	4.913	0.118
						2" Ice	7.240	6.258	0.235
						4" Ice	9.261	9.285	0.576
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	5.399 5.844	3.693 4.295	0.028 0.070
(P)			1.000			1" Ice	6.299	4.913	0.118

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	7.240	6.258	0.235
						4" Ice	9.261	9.285	0.576
BXA-70063-4CF-EDIN-X w/ Mount Pipe (P)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.399 5.844 6.299 7.240 9.261	3.693 4.295 4.913 6.258 9.285	0.028 0.070 0.118 0.235 0.576
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (P)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
800 10735V01 w/ Mount Pipe (P)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.042 9.720 10.373 11.691 14.446	5.489 6.710 7.688 9.563 13.514	0.058 0.121 0.192 0.362 0.849
RRH2x40-AWS (P)	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2x40-AWS (P)	B	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2x40-AWS (P)	C	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
(2) FD9R6004/2C-3L (E)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (E)	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (E)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063

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
Platform Mount [LP 304-1]	C	None		0.000	108.000	No Ice	17.460	17.460	1.349
(E)						1/2" Ice	22.440	22.440	1.625
						1" Ice	27.420	27.420	1.900
						2" Ice	37.380	37.380	2.451
						4" Ice	57.300	57.300	3.554
@									
APX16DWV-16DWV-S-E-A	A	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.110
(E)			0.000			1" Ice	8.518	4.960	0.165
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
APX16DWV-16DWV-S-E-A	B	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.110
(E)			0.000			1" Ice	8.518	4.960	0.165
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
APX16DWV-16DWV-S-E-A	C	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.110
(E)			0.000			1" Ice	8.518	4.960	0.165
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
KRY 112 144/1	A	From Leg	2.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	2.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	2.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 89/5	A	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
KRY 112 89/5	B	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
KRY 112 89/5	C	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
Side Arm Mount [SO 102-3]	C	None		0.000	100.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
@									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
742 213 w/ Mount Pipe	A	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
742 213 w/ Mount Pipe	B	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
742 213 w/ Mount Pipe	C	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
Pipe Mount [PM 601-3]	C	None		0.000	90.000	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
@									
KS24019-L112A	C	From Leg	2.000	0.000	70.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			2.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
KS24019-L112A	A	From Leg	2.000	0.000	70.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			2.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
Side Arm Mount [SO 701-1]	C	From Leg	0.500	0.000	70.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
Side Arm Mount [SO 701-1]	A	From Leg	0.500	0.000	70.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
@									
KS24019-L112A	B	From Leg	2.000	0.000	49.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			2.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
Side Arm Mount [SO 701-1]	B	From Leg	0.500	0.000	49.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
@									

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 102.333	42.329	27	2.828	0.016
L2	102.333 - 91.75	21.741	27	2.156	0.008
L3	95 - 85.333	18.572	27	1.968	0.007
L4	85.333 - 82.5	14.778	27	1.750	0.005
L5	82.5 - 77.1667	13.756	27	1.693	0.005
L6	77.1667 - 66.667	11.934	27	1.570	0.004
L7	66.667 - 60	8.759	27	1.317	0.003
L8	60 - 46.5	7.033	27	1.155	0.003
L9	51 - 44.25	5.060	27	0.938	0.002
L10	44.25 - 27.75	3.796	27	0.833	0.002
L11	27.75 - 24.083	1.464	27	0.519	0.001
L12	24.083 - 18.083	1.092	27	0.451	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L13	18.083 - 0	0.606	27	0.324	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.000	(2) DB980H90A-M w/ Mount Pipe	27	41.736	2.814	0.016	12388
137.000	PCS 1900MHz 4x45W-65MHz	27	40.552	2.785	0.015	12388
128.000	(2) RRUS-11	27	35.274	2.652	0.014	5161
120.000	(4) ALP 9212-N w/ Mount Pipe	27	30.737	2.522	0.012	3096
110.000	TME-DB-T16Z-8AB-0Z w/mount pipe	27	25.427	2.331	0.010	2063
108.000	BXA-185060/8CFx2 w/ Mount Pipe	27	24.429	2.288	0.010	1934
100.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	27	20.699	2.097	0.008	1969
90.000	742 213 w/ Mount Pipe	27	16.554	1.849	0.006	2510
70.000	KS24019-L112A	27	9.707	1.397	0.003	2397
49.000	KS24019-L112A	27	4.668	0.903	0.002	3166

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 102.333	107.757	2	7.202	0.041
L2	102.333 - 91.75	55.427	2	5.494	0.021
L3	95 - 85.333	47.359	2	5.017	0.017
L4	85.333 - 82.5	37.694	2	4.463	0.013
L5	82.5 - 77.1667	35.091	2	4.318	0.012
L6	77.1667 - 66.667	30.446	2	4.005	0.011
L7	66.667 - 60	22.352	2	3.361	0.008
L8	60 - 46.5	17.949	2	2.948	0.006
L9	51 - 44.25	12.917	2	2.394	0.005
L10	44.25 - 27.75	9.692	2	2.128	0.004
L11	27.75 - 24.083	3.739	2	1.325	0.002
L12	24.083 - 18.083	2.789	2	1.151	0.002
L13	18.083 - 0	1.547	2	0.827	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.000	(2) DB980H90A-M w/ Mount Pipe	2	106.251	7.165	0.040	4989
137.000	PCS 1900MHz 4x45W-65MHz	2	103.243	7.092	0.039	4989
128.000	(2) RRUS-11	2	89.833	6.753	0.035	2077
120.000	(4) ALP 9212-N w/ Mount Pipe	2	78.303	6.423	0.031	1244
110.000	TME-DB-T16Z-8AB-0Z w/mount pipe	2	64.804	5.939	0.026	826

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
108.000	BXA-185060/8CFx2 w/ Mount Pipe	2	62.266	5.830	0.025	774
100.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	2	52.775	5.344	0.020	787
90.000	742 213 w/ Mount Pipe	2	42.219	4.715	0.014	998
70.000	KS24019-L112A	2	24.769	3.564	0.009	947
49.000	KS24019-L112A	2	11.916	2.306	0.004	1245

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	140 - 138.117	TP23.721x16x0.25	37.667	0.000	0.0	36.000	12.990	-1.352	467.622	0.003
	138.117 - 136.233					36.000	13.300	-1.792	478.810	0.004
	136.233 - 134.35					36.000	13.611	-1.882	489.997	0.004
	134.35 - 132.467					36.000	13.922	-1.975	501.185	0.004
	132.467 - 130.583					36.000	14.233	-2.070	512.372	0.004
	130.583 - 128.7					36.000	14.543	-2.167	523.559	0.004
	128.7 - 126.817					36.000	14.854	-3.671	534.747	0.007
	126.817 - 124.933					36.000	15.165	-3.778	545.934	0.007
	124.933 - 123.05					36.000	15.476	-3.890	557.121	0.007
	123.05 - 121.167					36.000	15.786	-4.004	568.309	0.007
	121.167 - 119.283					36.000	16.097	-5.176	579.496	0.009
	119.283 - 117.4					36.000	16.408	-5.306	590.684	0.009
	117.4 - 115.516					36.000	16.719	-5.440	601.871	0.009
	115.516 - 113.633					36.000	17.029	-5.580	613.058	0.009
	113.633 - 111.75					36.000	17.340	-5.724	624.246	0.009
	111.75 - 109.866					36.000	17.651	-5.932	635.433	0.009
	109.866 - 107.983					36.000	17.962	-7.669	646.620	0.012
	107.983 - 106.1					36.000	18.272	-7.836	657.808	0.012
	106.1 - 104.216					36.000	18.583	-7.993	668.995	0.012
	104.216 - 102.333					36.000	18.894	-8.154	680.183	0.012
L2	102.333 - 101.285	TP25.89x23.721x0.376	10.583	0.000	0.0	31.551	28.553	-8.305	900.884	0.009
	101.285 - 100.238					31.551	28.814	-8.440	909.095	0.009
	100.238 - 99.1903					31.551	29.074	-8.842	917.306	0.010
	99.1903 - 98.1427					31.551	29.334	-8.980	925.517	0.010
	98.1427 - 97.0951					31.551	29.594	-9.121	933.728	0.010
	97.0951 - 96.0476					31.551	29.855	-9.262	941.939	0.010
	96.0476 - 95					31.551	30.115	-9.405	950.150	0.010
	95 - 91.75					31.551	30.922	-4.867	975.623	0.005
L3	95 - 91.75	TP26.706x24.724x0.422	9.667	0.000	0.0	36.008	33.962	-5.338	1222.930	0.004
	91.75 - 90.6805					36.008	34.260	-10.391	1233.660	0.008
	90.6805 - 89.611					36.008	34.559	-10.850	1244.400	0.009
	89.611 - 88.5415					36.008	34.857	-11.033	1255.140	0.009
	88.5415 - 87.472					36.008	35.155	-11.217	1265.880	0.009
	87.472 - 86.4025					36.008	35.453	-11.403	1276.620	0.009
	86.4025 - 85.333					36.008	35.752	-11.590	1287.360	0.009
L4	85.333 - 83.9165	TP27.287x26.706x0.601	2.833	0.000	0.0	34.086	51.043	-11.870	1739.860	0.007
	83.9165 - 82.5					34.086	51.604	-12.152	1759.000	0.007
L5	82.5 - 81.4333	TP28.38x27.287x0.527	5.333	0.000	0.0	35.070	45.739	-12.369	1604.080	0.008
	81.4333 - 80.3667					35.070	46.110	-12.586	1617.080	0.008
	80.3667 - 79.3					35.070	46.481	-12.804	1630.080	0.008
	79.3 - 78.2334					35.070	46.852	-13.023	1643.090	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	78.2334 - 77.1667					35.070	47.222	-13.245	1656.090	0.008
L6	77.1667 - 76.1167	TP30.534x28.38x0.512	10.500	0.000	0.0	35.246	46.256	-13.470	1630.310	0.008
	76.1167 - 75.0668					35.246	46.610	-13.698	1642.810	0.008
	75.0668 - 74.0168					35.246	46.965	-13.926	1655.310	0.008
	74.0168 - 72.9668					35.246	47.320	-14.157	1667.820	0.008
	72.9668 - 71.9168					35.246	47.674	-14.389	1680.320	0.009
	71.9168 - 70.8669					35.246	48.029	-14.623	1692.820	0.009
	70.8669 - 69.8169					35.246	48.384	-14.993	1705.320	0.009
	69.8169 - 68.7669					35.246	48.739	-15.230	1717.820	0.009
	68.7669 - 67.717					35.246	49.093	-15.469	1730.330	0.009
	67.717 - 66.667					35.246	49.448	-15.710	1742.830	0.009
L7	66.667 - 65.5558	TP31.901x30.534x0.508	6.667	0.000	0.0	32.802	49.444	-15.938	1621.890	0.010
	65.5558 - 64.4447					32.802	49.817	-16.170	1634.110	0.010
	64.4447 - 63.3335					32.802	50.189	-16.403	1646.330	0.010
	63.3335 - 62.2223					32.802	50.562	-16.637	1658.550	0.010
	62.2223 - 61.1112					32.802	50.934	-16.873	1670.770	0.010
	61.1112 - 60					32.802	51.307	-17.111	1682.980	0.010
L8	60 - 59	TP34.67x31.901x0.505 H1-3+VT (1.40 CR) - 8/9	13.500	0.000	0.0	32.396	51.391	-17.344	1664.880	0.010
	59 - 58	H1-3+VT (1.40 CR) - 8/8				32.396	51.725	-17.578	1675.680	0.010
	58 - 57	H1-3+VT (1.40 CR) - 8/7				32.396	52.059	-17.812	1686.490	0.011
	57 - 56	H1-3+VT (1.40 CR) - 8/6				32.396	52.392	-18.048	1697.290	0.011
	56 - 55	H1-3+VT (1.40 CR) - 8/5				32.396	52.726	-18.285	1708.100	0.011
	55 - 54	H1-3+VT (1.40 CR) - 8/4				32.396	53.059	-18.524	1718.900	0.011
	54 - 53	H1-3+VT (1.40 CR) - 8/3				32.396	53.393	-18.764	1729.710	0.011
	53 - 52	H1-3+VT (1.40 CR) - 8/2				32.396	53.726	-19.006	1740.520	0.011
	52 - 51	H1-3+VT (1.40 CR) - 8				32.396	54.060	-19.248	1751.320	0.011
	51 - 46.5	H1-3+VT (1.40 CR) - 8				32.396	55.561	-10.278	1799.950	0.006
L9	51 - 46.5	TP34.506x33.122x0.554 H1-3+VT (1.34 CR) - 9/2	6.750	0.000	0.0	32.920	59.764	-10.926	1967.390	0.006
	46.5 - 45.375	H1-3+VT (1.34 CR) - 9				32.920	60.175	-21.499	1980.940	0.011
	45.375 - 44.25	H1-3+VT (1.34 CR) - 9				32.920	60.587	-21.778	1994.500	0.011
L10	44.25 - 43.2188	TP37.89x34.506x0.652	16.500	0.000	0.0	33.425	71.476	-22.068	2389.080	0.009
	43.2188 - 42.1875					33.425	71.920	-22.356	2403.910	0.009
	42.1875 - 41.1563					33.425	72.363	-22.646	2418.740	0.009
	41.1563 - 40.125					33.425	72.807	-22.938	2433.570	0.009
	40.125 - 39.0938					33.425	73.251	-23.231	2448.400	0.009
	39.0938 - 38.0625					33.425	73.694	-23.525	2463.230	0.010
	38.0625 - 37.0313					33.425	74.138	-23.821	2478.060	0.010
	37.0313 - 36					33.425	74.582	-24.119	2492.890	0.010
	36 - 34.9688					33.425	75.025	-24.418	2507.730	0.010
	34.9688 - 33.9375					33.425	75.469	-24.719	2522.560	0.010
	33.9375 - 32.9063					33.425	75.913	-25.022	2537.390	0.010
	32.9063 - 31.875					33.425	76.356	-25.326	2552.220	0.010
	31.875 - 30.8438					33.425	76.800	-25.631	2567.050	0.010
	30.8438 - 29.8125					33.425	77.244	-25.938	2581.880	0.010
	29.8125 - 28.7813					33.425	77.688	-26.247	2596.710	0.010
	28.7813 - 27.75					33.425	78.131	-26.557	2611.540	0.010
L11	27.75 - 26.5277	TP38.642x37.89x0.645	3.667	0.000	0.0	33.421	77.892	-26.923	2603.250	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	26.5277 - 25.3053					33.421	78.413	-27.293	2620.650	0.010
	25.3053 - 24.083					33.421	78.934	-27.665	2638.060	0.010
L12	24.083 - 23.083	TP39.872x38.642x0.551 H1-3+VT (1.46 CR) - 12/5	6.000	0.000	0.0	32.243	67.940	-27.978	2190.630	0.013
	23.083 - 22.083	H1-3+VT (1.46 CR) - 12/4				32.243	68.304	-28.293	2202.360	0.013
	22.083 - 21.083	H1-3+VT (1.46 CR) - 12/3				32.243	68.668	-28.609	2214.090	0.013
	21.083 - 20.083	H1-3+VT (1.46 CR) - 12/2				32.243	69.032	-28.926	2225.820	0.013
	20.083 - 19.083	H1-3+VT (1.46 CR) - 12				32.243	69.395	-29.245	2237.550	0.013
	19.083 - 18.083	H1-3+VT (1.46 CR) - 12				32.243	69.759	-29.565	2249.280	0.013
L13	18.083 - 17.0784	TP43.58x39.872x0.626	18.083	0.000	0.0	35.530	79.515	-29.870	2825.150	0.011
	17.0784 - 16.0738					35.530	79.930	-30.175	2839.900	0.011
	16.0738 - 15.0692					35.530	80.346	-30.481	2854.660	0.011
	15.0692 - 14.0646					35.530	80.761	-30.788	2869.410	0.011
	14.0646 - 13.0599					35.530	81.176	-31.097	2884.160	0.011
	13.0599 - 12.0553					35.530	81.591	-31.407	2898.910	0.011
	12.0553 - 11.0507					35.530	82.006	-31.719	2913.660	0.011
	11.0507 - 10.0461					35.530	82.422	-32.032	2928.420	0.011
	10.0461 - 9.0415					35.530	82.837	-32.347	2943.170	0.011
	9.0415 - 8.03689					35.530	83.252	-32.663	2957.920	0.011
	8.03689 - 7.03228					35.530	83.667	-32.981	2972.670	0.011
	7.03228 - 6.02767					35.530	84.082	-33.300	2987.420	0.011
	6.02767 - 5.02306					35.530	84.498	-33.620	3002.170	0.011
	5.02306 - 4.01844					35.530	84.913	-33.942	3016.930	0.011
	4.01844 - 3.01383					35.530	85.328	-34.265	3031.680	0.011
	3.01383 - 2.00922					35.530	85.743	-34.590	3046.430	0.011
	2.00922 - 1.00461					35.530	86.158	-34.916	3061.180	0.011
	1.00461 - 0					35.530	86.574	-35.244	3075.930	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	140 - 138.117	TP23.721x16x0.25	3.457	0.816	36.000	0.023	0.000	0.000	36.000	0.000
	138.117 - 136.233		11.543	2.597	36.000	0.072	0.000	0.000	36.000	0.000
	136.233 - 134.35		20.756	4.457	36.000	0.124	0.000	0.000	36.000	0.000
	134.35 - 132.467		30.211	6.199	36.000	0.172	0.000	0.000	36.000	0.000
	132.467 - 130.583		39.911	7.833	36.000	0.218	0.000	0.000	36.000	0.000
	130.583 - 128.7		49.859	9.369	36.000	0.260	0.000	0.000	36.000	0.000
	128.7 - 126.817		70.047	12.614	36.000	0.350	0.000	0.000	36.000	0.000
	126.817 - 124.933		87.769	15.161	36.000	0.421	0.000	0.000	36.000	0.000
	124.933 - 123.05		105.777	17.540	36.000	0.487	0.000	0.000	36.000	0.000
	123.05 - 121.167		124.043	19.762	36.000	0.549	0.000	0.000	36.000	0.000
	121.167 - 119.283		145.752	22.327	36.000	0.620	0.000	0.000	36.000	0.000
	119.283 - 117.4		172.890	25.485	36.000	0.708	0.000	0.000	36.000	0.000
	117.4 - 115.516		200.290	28.430	36.000	0.790	0.000	0.000	36.000	0.000
	115.516 - 113.633		227.954	31.180	36.000	0.866	0.000	0.000	36.000	0.000
	113.633 - 111.75		255.883	33.750	36.000	0.937	0.000	0.000	36.000	0.000
	111.75 - 109.866		284.103	36.157	36.000	1.004	0.000	0.000	36.000	0.000
	109.866 - 107.983		315.358	38.750	36.000	1.076	0.000	0.000	36.000	0.000
	107.983 - 106.1		350.712	41.633	36.000	1.156	0.000	0.000	36.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	106.1 - 104.216		386.486	44.350	36.000	1.232	0.000	0.000	36.000	0.000
	104.216 - 102.333		422.804	46.926	36.000	1.304	0.000	0.000	36.000	0.000
L2	102.333 - 101.285	TP25.89x23.721x0.376	443.108	32.591	31.551	1.033	0.000	0.000	31.551	0.000
	101.285 - 100.238		463.527	33.475	31.551	1.061	0.000	0.000	31.551	0.000
	100.238 - 99.1903		484.741	34.379	31.551	1.090	0.000	0.000	31.551	0.000
	99.1903 - 98.1427		506.270	35.266	31.551	1.118	0.000	0.000	31.551	0.000
	98.1427 - 97.0951		527.916	36.126	31.551	1.145	0.000	0.000	31.551	0.000
	97.0951 - 96.0476		549.678	36.957	31.551	1.171	0.000	0.000	31.551	0.000
	96.0476 - 95		571.558	37.762	31.551	1.197	0.000	0.000	31.551	0.000
	95 - 91.75		312.243	19.558	31.551	0.620	0.000	0.000	31.551	0.000
L3	95 - 91.75	TP26.706x24.724x0.422	328.058	19.160	36.008	0.532	0.000	0.000	36.008	0.000
	91.75 - 90.6805		663.173	38.055	36.008	1.057	0.000	0.000	36.008	0.000
	90.6805 - 89.611		686.553	38.714	36.008	1.075	0.000	0.000	36.008	0.000
	89.611 - 88.5415		710.501	39.376	36.008	1.094	0.000	0.000	36.008	0.000
	88.5415 - 87.472		734.572	40.016	36.008	1.111	0.000	0.000	36.008	0.000
	87.472 - 86.4025		758.768	40.636	36.008	1.129	0.000	0.000	36.008	0.000
	86.4025 - 85.333		783.087	41.237	36.008	1.145	0.000	0.000	36.008	0.000
L4	85.333 - 83.9165	TP27.287x26.706x0.601	815.504	30.148	34.086	0.884	0.000	0.000	34.086	0.000
	83.9165 - 82.5		848.175	30.669	34.086	0.900	0.000	0.000	34.086	0.000
L5	82.5 - 81.4333	TP28.38x27.287x0.527	872.933	35.123	35.070	1.002	0.000	0.000	35.070	0.000
	81.4333 - 80.3667		897.833	35.541	35.070	1.013	0.000	0.000	35.070	0.000
	80.3667 - 79.3		922.875	35.946	35.070	1.025	0.000	0.000	35.070	0.000
	79.3 - 78.2334		948.058	36.339	35.070	1.036	0.000	0.000	35.070	0.000
	78.2334 - 77.1667		973.383	36.721	35.070	1.047	0.000	0.000	35.070	0.000
L6	77.1667 - 76.1167	TP30.534x28.38x0.512	998.442	38.112	35.246	1.081	0.000	0.000	35.246	0.000
	76.1167 - 75.0668		1023.633	38.476	35.246	1.092	0.000	0.000	35.246	0.000
	75.0668 - 74.0168		1048.958	38.830	35.246	1.102	0.000	0.000	35.246	0.000
	74.0168 - 72.9668		1074.417	39.173	35.246	1.111	0.000	0.000	35.246	0.000
	72.9668 - 71.9168		1100.000	39.506	35.246	1.121	0.000	0.000	35.246	0.000
	71.9168 - 70.8669		1125.725	39.830	35.246	1.130	0.000	0.000	35.246	0.000
	70.8669 - 69.8169		1151.683	40.148	35.246	1.139	0.000	0.000	35.246	0.000
	69.8169 - 68.7669		1177.783	40.457	35.246	1.148	0.000	0.000	35.246	0.000
	68.7669 - 67.717		1204.008	40.758	35.246	1.156	0.000	0.000	35.246	0.000
	67.717 - 66.667		1230.375	41.050	35.246	1.165	0.000	0.000	35.246	0.000
L7	66.667 - 65.5558	TP31.901x30.534x0.508	1258.417	41.656	32.802	1.270	0.000	0.000	32.802	0.000
	65.5558 - 64.4447		1286.600	41.949	32.802	1.279	0.000	0.000	32.802	0.000
	64.4447 - 63.3335		1314.925	42.233	32.802	1.288	0.000	0.000	32.802	0.000
	63.3335 - 62.2223		1343.392	42.509	32.802	1.296	0.000	0.000	32.802	0.000
	62.2223 - 61.1112		1372.008	42.777	32.802	1.304	0.000	0.000	32.802	0.000
	61.1112 - 60		1400.758	43.036	32.802	1.312	0.000	0.000	32.802	0.000
L8	60 - 59	TP34.67x31.901x0.505	1426.750	43.468	32.396	1.342	0.000	0.000	32.396	0.000
	59 - 58		1452.858	43.690	32.396	1.349	0.000	0.000	32.396	0.000
	58 - 57		1479.07	43.905	32.396	1.355	0.000	0.000	32.396	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	57 - 56		1505.405	44.115	32.396	1.362	0.000	0.000	32.396	0.000
	56 - 55		1531.840	44.320	32.396	1.368	0.000	0.000	32.396	0.000
	55 - 54		1558.402	44.519	32.396	1.374	0.000	0.000	32.396	0.000
	54 - 53		1585.050	44.712	32.396	1.380	0.000	0.000	32.396	0.000
	53 - 52		1611.842	44.900	32.396	1.386	0.000	0.000	32.396	0.000
	52 - 51		1638.733	45.084	32.396	1.392	0.000	0.000	32.396	0.000
	51 - 46.5		866.642	22.563	32.396	0.696	0.000	0.000	32.396	0.000
L9	51 - 46.5	TP34.506x33.122x0.554	894.783	22.131	32.920	0.672	0.000	0.000	32.920	0.000
	46.5 - 45.375		1792.542	43.727	32.920	1.328	0.000	0.000	32.920	0.000
	45.375 - 44.25		1823.800	43.882	32.920	1.333	0.000	0.000	32.920	0.000
L10	44.25 - 43.2188	TP37.89x34.506x0.652	1852.567	37.761	33.425	1.130	0.000	0.000	33.425	0.000
	43.2188 - 42.1875		1881.442	37.874	33.425	1.133	0.000	0.000	33.425	0.000
	42.1875 - 41.1563		1910.433	37.983	33.425	1.136	0.000	0.000	33.425	0.000
	41.1563 - 40.125		1939.533	38.089	33.425	1.140	0.000	0.000	33.425	0.000
	40.125 - 39.0938		1968.750	38.191	33.425	1.143	0.000	0.000	33.425	0.000
	39.0938 - 38.0625		1998.075	38.290	33.425	1.146	0.000	0.000	33.425	0.000
	38.0625 - 37.0313		2027.508	38.387	33.425	1.148	0.000	0.000	33.425	0.000
	37.0313 - 36		2057.058	38.480	33.425	1.151	0.000	0.000	33.425	0.000
	36 - 34.9688		2086.725	38.570	33.425	1.154	0.000	0.000	33.425	0.000
	34.9688 - 33.9375		2116.500	38.658	33.425	1.157	0.000	0.000	33.425	0.000
	33.9375 - 32.9063		2146.392	38.743	33.425	1.159	0.000	0.000	33.425	0.000
	32.9063 - 31.875		2176.392	38.825	33.425	1.162	0.000	0.000	33.425	0.000
	31.875 - 30.8438		2206.508	38.905	33.425	1.164	0.000	0.000	33.425	0.000
	30.8438 - 29.8125		2236.742	38.983	33.425	1.166	0.000	0.000	33.425	0.000
	29.8125 - 28.7813		2267.092	39.057	33.425	1.169	0.000	0.000	33.425	0.000
	28.7813 - 27.75		2297.550	39.130	33.425	1.171	0.000	0.000	33.425	0.000
L11	27.75 - 26.5277	TP38.642x37.89x0.645	2333.808	39.585	33.421	1.184	0.000	0.000	33.421	0.000
	26.5277 - 25.3053		2370.225	39.666	33.421	1.187	0.000	0.000	33.421	0.000
	25.3053 - 24.083		2406.808	39.744	33.421	1.189	0.000	0.000	33.421	0.000
L12	24.083 - 23.083	TP39.872x38.642x0.551	2436.858	46.268	32.243	1.435	0.000	0.000	32.243	0.000
	23.083 - 22.083		2467.00	46.340	32.243	1.437	0.000	0.000	32.243	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	22.083 - 21.083		2497.258	46.409	32.243	1.439	0.000	0.000	32.243	0.000
	21.083 - 20.083		2527.617	46.475	32.243	1.441	0.000	0.000	32.243	0.000
	20.083 - 19.083		2558.083	46.540	32.243	1.443	0.000	0.000	32.243	0.000
	19.083 - 18.083		2588.642	46.603	32.243	1.445	0.000	0.000	32.243	0.000
L13	18.083 - 17.0784	TP43.58x39.872x0.626	2619.450	41.310	35.530	1.163	0.000	0.000	35.530	0.000
	17.0784 - 16.0738		2650.358	41.361	35.530	1.164	0.000	0.000	35.530	0.000
	16.0738 - 15.0692		2681.358	41.410	35.530	1.166	0.000	0.000	35.530	0.000
	15.0692 - 14.0646		2712.467	41.457	35.530	1.167	0.000	0.000	35.530	0.000
	14.0646 - 13.0599		2743.675	41.503	35.530	1.168	0.000	0.000	35.530	0.000
	13.0599 - 12.0553		2774.992	41.547	35.530	1.169	0.000	0.000	35.530	0.000
	12.0553 - 11.0507		2806.400	41.590	35.530	1.171	0.000	0.000	35.530	0.000
	11.0507 - 10.0461		2837.917	41.631	35.530	1.172	0.000	0.000	35.530	0.000
	10.0461 - 9.0415		2869.525	41.671	35.530	1.173	0.000	0.000	35.530	0.000
	9.0415 - 8.03689		2901.250	41.709	35.530	1.174	0.000	0.000	35.530	0.000
	8.03689 - 7.03228		2933.067	41.746	35.530	1.175	0.000	0.000	35.530	0.000
	7.03228 - 6.02767		2964.992	41.782	35.530	1.176	0.000	0.000	35.530	0.000
	6.02767 - 5.02306		2997.017	41.816	35.530	1.177	0.000	0.000	35.530	0.000
	5.02306 - 4.01844		3029.142	41.849	35.530	1.178	0.000	0.000	35.530	0.000
	4.01844 - 3.01383		3061.375	41.881	35.530	1.179	0.000	0.000	35.530	0.000
	3.01383 - 2.00922		3093.717	41.911	35.530	1.180	0.000	0.000	35.530	0.000
	2.00922 - 1.00461		3126.158	41.941	35.530	1.180	0.000	0.000	35.530	0.000
	1.00461 - 0		3158.700	41.969	35.530	1.181	0.000	0.000	35.530	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	140 - 138.117	TP23.721x16x0.25	3.905	0.301	24.000	0.025	0.000	0.000	24.000	0.000
	138.117 - 136.233		4.829	0.363	24.000	0.031	0.001	0.000	24.000	0.000
	136.233 - 134.35		4.956	0.364	24.000	0.031	0.001	0.000	24.000	0.000
	134.35 - 132.467		5.085	0.365	24.000	0.031	0.002	0.000	24.000	0.000
	132.467 - 130.583		5.217	0.367	24.000	0.031	0.002	0.000	24.000	0.000

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	130.583 - 128.7		5.350	0.368	24.000	0.031	0.002	0.000	24.000	0.000
	128.7 - 126.817		9.339	0.629	24.000	0.053	1.313	0.111	24.000	0.005
	126.817 - 124.933		9.495	0.626	24.000	0.053	1.512	0.123	24.000	0.005
	124.933 - 123.05		9.632	0.622	24.000	0.053	1.511	0.118	24.000	0.005
	123.05 - 121.167		9.770	0.619	24.000	0.052	1.510	0.113	24.000	0.005
	121.167 - 119.283		14.344	0.891	24.000	0.075	1.510	0.109	24.000	0.005
	119.283 - 117.4		14.484	0.883	24.000	0.075	1.509	0.105	24.000	0.004
	117.4 - 115.516		14.624	0.875	24.000	0.074	1.508	0.101	24.000	0.004
	115.516 - 113.633		14.765	0.867	24.000	0.073	1.507	0.097	24.000	0.004
	113.633 - 111.75		14.907	0.860	24.000	0.073	1.506	0.094	24.000	0.004
	111.75 - 109.866		15.223	0.862	24.000	0.073	2.047	0.123	24.000	0.005
	109.866 - 107.983		18.712	1.042	24.000	0.088	3.625	0.210	24.000	0.009
	107.983 - 106.1		18.853	1.032	24.000	0.087	3.624	0.203	24.000	0.008
	106.1 - 104.216		19.087	1.027	24.000	0.087	3.590	0.194	24.000	0.008
	104.216 - 102.333		19.337	1.023	24.000	0.087	2.575	0.135	24.000	0.006
L2	102.333 - 101.285	TP25.89x23.721x0.376	19.439	0.681	21.034	0.066	2.574	0.089	21.034	0.004
	101.285 - 100.238		19.549	0.678	21.034	0.066	2.574	0.087	21.034	0.004
	100.238 - 99.1903		20.500	0.705	21.034	0.068	2.574	0.086	21.034	0.004
	99.1903 - 98.1427		20.610	0.703	21.034	0.068	2.574	0.084	21.034	0.004
	98.1427 - 97.0951		20.722	0.700	21.034	0.068	2.575	0.083	21.034	0.004
	97.0951 - 96.0476		20.834	0.698	21.034	0.067	2.575	0.081	21.034	0.004
	96.0476 - 95		20.946	0.696	21.034	0.067	2.575	0.080	21.034	0.004
	95 - 91.75		10.504	0.340	21.034	0.033	1.257	0.037	21.034	0.002
L3	95 - 91.75	TP26.706x24.724x0.422	10.861	0.320	24.006	0.027	0.447	0.012	24.006	0.001
	91.75 - 90.6805		21.468	0.627	24.006	0.053	2.576	0.069	24.006	0.003
	90.6805 - 89.611		22.340	0.646	24.006	0.055	0.876	0.023	24.006	0.001
	89.611 - 88.5415		22.455	0.644	24.006	0.055	0.877	0.023	24.006	0.001
	88.5415 - 87.472		22.570	0.642	24.006	0.054	0.878	0.022	24.006	0.001
	87.472 - 86.4025		22.686	0.640	24.006	0.054	0.879	0.022	24.006	0.001
	86.4025 - 85.333		22.803	0.638	24.006	0.054	0.880	0.022	24.006	0.001
L4	85.333 - 83.9165	TP27.287x26.706x0.601	22.979	0.450	22.724	0.040	0.885	0.015	22.724	0.001
	83.9165 - 82.5		23.157	0.449	22.724	0.040	0.891	0.015	22.724	0.001
L5	82.5 - 81.4333	TP28.38x27.287x0.527	23.286	0.509	23.380	0.044	0.895	0.017	23.380	0.001
	81.4333 - 80.3667		23.416	0.508	23.380	0.044	0.899	0.017	23.380	0.001
	80.3667 - 79.3		23.547	0.507	23.380	0.044	0.903	0.016	23.380	0.001
	79.3 - 78.2334		23.679	0.505	23.380	0.044	0.907	0.016	23.380	0.001
	78.2334 - 77.1667		23.811	0.504	23.380	0.044	0.911	0.016	23.380	0.001
L6	77.1667 - 76.1167	TP30.534x28.38x0.512	23.936	0.517	23.497	0.045	0.915	0.016	23.497	0.001
	76.1167 - 75.0668		24.061	0.516	23.497	0.045	0.919	0.016	23.497	0.001
	75.0668 - 74.0168		24.187	0.515	23.497	0.045	0.923	0.016	23.497	0.001
	74.0168 - 72.9668		24.313	0.514	23.497	0.044	0.927	0.016	23.497	0.001
	72.9668 - 71.9168		24.440	0.513	23.497	0.044	0.931	0.016	23.497	0.001
	71.9168 - 70.8669		24.568	0.512	23.497	0.044	0.935	0.015	23.497	0.001
	70.8669 - 69.8169		24.794	0.512	23.497	0.044	0.935	0.015	23.497	0.001
	69.8169 - 68.7669		24.923	0.511	23.497	0.044	0.841	0.014	23.497	0.001
	68.7669 - 67.717		25.051	0.510	23.497	0.044	0.845	0.013	23.497	0.001
	67.717 - 66.667		25.181	0.509	23.497	0.044	0.849	0.013	23.497	0.001
L7	66.667 - 65.5558	TP31.901x30.534x0.508	25.307	0.512	21.868	0.048	0.853	0.013	21.868	0.001
	65.5558 - 64.4447		25.434	0.511	21.868	0.047	0.856	0.013	21.868	0.001
	64.4447 - 63.3335		25.561	0.509	21.868	0.047	0.860	0.013	21.868	0.001
	63.3335 - 62.2223		25.689	0.508	21.868	0.047	0.864	0.013	21.868	0.001
	62.2223 - 61.1112		25.817	0.507	21.868	0.047	0.868	0.013	21.868	0.001
	61.1112 - 60		25.946	0.506	21.868	0.047	0.872	0.013	21.868	0.001
L8	60 - 59	TP34.67x31.901x0.505	26.056	0.507	21.597	0.048	0.875	0.013	21.597	0.001
	59 - 58		26.167	0.506	21.597	0.048	0.879	0.012	21.597	0.001
	58 - 57		26.279	0.505	21.597	0.047	0.883	0.012	21.597	0.001
	57 - 56		26.391	0.504	21.597	0.047	0.887	0.012	21.597	0.001
	56 - 55		26.503	0.503	21.597	0.047	0.891	0.012	21.597	0.001
	55 - 54		26.616	0.502	21.597	0.047	0.895	0.012	21.597	0.001
	54 - 53		26.728	0.501	21.597	0.047	0.899	0.012	21.597	0.001

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	53 - 52		26.842	0.500	21.597	0.047	0.903	0.012	21.597	0.001
	52 - 51		26.956	0.499	21.597	0.047	0.907	0.012	21.597	0.001
	51 - 46.5		13.755	0.248	21.597	0.024	0.531	0.006	21.597	0.000
L9	51 - 46.5	TP34.506x33.122x0.554	13.867	0.232	21.946	0.021	0.493	0.006	21.946	0.000
	46.5 - 45.375		27.730	0.461	21.946	0.043	1.028	0.012	21.946	0.001
	45.375 - 44.25		27.852	0.460	21.946	0.043	1.033	0.012	21.946	0.001
L10	44.25 - 43.2188	TP37.89x34.506x0.652	27.956	0.391	22.283	0.036	1.037	0.010	22.283	0.000
	43.2188 - 42.1875		28.063	0.390	22.283	0.036	1.041	0.010	22.283	0.000
	42.1875 - 41.1563		28.171	0.389	22.283	0.035	1.046	0.010	22.283	0.000
	41.1563 - 40.125		28.279	0.388	22.283	0.035	1.050	0.010	22.283	0.000
	40.125 - 39.0938		28.388	0.388	22.283	0.035	1.054	0.010	22.283	0.000
	39.0938 - 38.0625		28.497	0.387	22.283	0.035	1.059	0.009	22.283	0.000
	38.0625 - 37.0313		28.606	0.386	22.283	0.035	1.063	0.009	22.283	0.000
	37.0313 - 36		28.715	0.385	22.283	0.035	1.068	0.009	22.283	0.000
	36 - 34.9688		28.825	0.384	22.283	0.035	1.072	0.009	22.283	0.000
	34.9688 - 33.9375		28.935	0.383	22.283	0.035	1.077	0.009	22.283	0.000
	33.9375 - 32.9063		29.045	0.383	22.283	0.035	1.081	0.009	22.283	0.000
	32.9063 - 31.875		29.156	0.382	22.283	0.035	1.086	0.009	22.283	0.000
	31.875 - 30.8438		29.267	0.381	22.283	0.035	1.090	0.009	22.283	0.000
	30.8438 - 29.8125		29.379	0.380	22.283	0.035	1.095	0.009	22.283	0.000
	29.8125 - 28.7813		29.490	0.380	22.283	0.035	1.099	0.009	22.283	0.000
	28.7813 - 27.75		29.602	0.379	22.283	0.035	1.104	0.009	22.283	0.000
L11	27.75 - 26.5277	TP38.642x37.89x0.645	29.738	0.382	22.281	0.035	1.112	0.009	22.281	0.000
	26.5277 - 25.3053		29.871	0.381	22.281	0.035	1.119	0.009	22.281	0.000
	25.3053 - 24.083		30.005	0.380	22.281	0.035	1.127	0.009	22.281	0.000
L12	24.083 - 23.083	TP39.872x38.642x0.551	30.108	0.443	21.496	0.042	1.132	0.010	21.496	0.000
	23.083 - 22.083		30.211	0.442	21.496	0.042	1.137	0.010	21.496	0.000
	22.083 - 21.083		30.314	0.441	21.496	0.042	1.143	0.010	21.496	0.000
	21.083 - 20.083		30.417	0.441	21.496	0.042	1.148	0.010	21.496	0.000
	20.083 - 19.083		30.521	0.440	21.496	0.042	1.153	0.010	21.496	0.000
	19.083 - 18.083		30.625	0.439	21.496	0.041	1.159	0.010	21.496	0.000
L13	18.083 - 17.0784	TP43.58x39.872x0.626	30.723	0.386	23.686	0.033	1.164	0.009	23.686	0.000
	17.0784 - 16.0738		30.823	0.386	23.686	0.033	1.169	0.009	23.686	0.000
	16.0738 - 15.0692		30.923	0.385	23.686	0.033	1.174	0.009	23.686	0.000
	15.0692 - 14.0646		31.024	0.384	23.686	0.033	1.179	0.008	23.686	0.000
	14.0646 - 13.0599		31.125	0.383	23.686	0.033	1.184	0.008	23.686	0.000
	13.0599 - 12.0553		31.226	0.383	23.686	0.033	1.189	0.008	23.686	0.000
	12.0553 - 11.0507		31.327	0.382	23.686	0.033	1.195	0.008	23.686	0.000
	11.0507 - 10.0461		31.429	0.381	23.686	0.033	1.200	0.008	23.686	0.000
	10.0461 - 9.0415		31.531	0.381	23.686	0.033	1.205	0.008	23.686	0.000
	9.0415 - 8.03689		31.633	0.380	23.686	0.033	1.210	0.008	23.686	0.000
	8.03689 - 7.03228		31.735	0.379	23.686	0.033	1.216	0.008	23.686	0.000
	7.03228 - 6.02767		31.837	0.379	23.686	0.032	1.221	0.008	23.686	0.000
	6.02767 - 5.02306		31.940	0.378	23.686	0.032	1.226	0.008	23.686	0.000
	5.02306 - 4.01844		32.043	0.377	23.686	0.032	1.232	0.008	23.686	0.000
	4.01844 - 3.01383		32.146	0.377	23.686	0.032	1.237	0.008	23.686	0.000
	3.01383 - 2.00922		32.250	0.376	23.686	0.032	1.243	0.008	23.686	0.000
	2.00922 - 1.00461		32.354	0.376	23.686	0.032	1.248	0.008	23.686	0.000
	1.00461 - 0		32.458	0.375	23.686	0.032	1.254	0.008	23.686	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 138.117	0.003	0.023	0.000	0.025	0.000	0.026 ✔	1.333	H1-3+VT ✔
	138.117 - 136.233	0.004	0.072	0.000	0.031	0.000	0.076 ✔	1.333	H1-3+VT ✔
	136.233 - 134.35	0.004	0.124	0.000	0.031	0.000	0.128 ✔	1.333	H1-3+VT ✔
	134.35 - 132.467	0.004	0.172	0.000	0.031	0.000	0.176 ✔	1.333	H1-3+VT ✔
	132.467 - 130.583	0.004	0.218	0.000	0.031	0.000	0.222 ✔	1.333	H1-3+VT ✔
	130.583 - 128.7	0.004	0.260	0.000	0.031	0.000	0.265 ✔	1.333	H1-3+VT ✔
	128.7 - 126.817	0.007	0.350	0.000	0.053	0.005	0.358 ✔	1.333	H1-3+VT ✔
	126.817 - 124.933	0.007	0.421	0.000	0.053	0.005	0.429 ✔	1.333	H1-3+VT ✔
	124.933 - 123.05	0.007	0.487	0.000	0.053	0.005	0.495 ✔	1.333	H1-3+VT ✔
	123.05 - 121.167	0.007	0.549	0.000	0.052	0.005	0.557 ✔	1.333	H1-3+VT ✔
	121.167 - 119.283	0.009	0.620	0.000	0.075	0.005	0.631 ✔	1.333	H1-3+VT ✔
	119.283 - 117.4	0.009	0.708	0.000	0.075	0.004	0.719 ✔	1.333	H1-3+VT ✔
	117.4 - 115.516	0.009	0.790	0.000	0.074	0.004	0.800 ✔	1.333	H1-3+VT ✔
	115.516 - 113.633	0.009	0.866	0.000	0.073	0.004	0.877 ✔	1.333	H1-3+VT ✔
	113.633 - 111.75	0.009	0.937	0.000	0.073	0.004	0.948 ✔	1.333	H1-3+VT ✔
	111.75 - 109.866	0.009	1.004	0.000	0.073	0.005	1.015 ✔	1.333	H1-3+VT ✔
	109.866 - 107.983	0.012	1.076	0.000	0.088	0.009	1.091 ✔	1.333	H1-3+VT ✔
	107.983 - 106.1	0.012	1.156	0.000	0.087	0.008	1.171 ✔	1.333	H1-3+VT ✔
	106.1 - 104.216	0.012	1.232	0.000	0.087	0.008	1.246 ✔	1.333	H1-3+VT ✔
	104.216 - 102.333	0.012	1.304	0.000	0.087	0.006	1.318 ✔	1.333	H1-3+VT ✔
L2	102.333 - 101.285	0.009	1.033	0.000	0.066	0.004	1.044 ✔	1.333	H1-3+VT ✔
	101.285 - 100.238	0.009	1.061	0.000	0.066	0.004	1.072 ✔	1.333	H1-3+VT ✔
	100.238 - 99.1903	0.010	1.090	0.000	0.068	0.004	1.101 ✔	1.333	H1-3+VT ✔
	99.1903 - 98.1427	0.010	1.118	0.000	0.068	0.004	1.129 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	98.1427 - 97.0951	0.010	1.145	0.000	0.068	0.004	1.156 ✔	1.333	H1-3+VT ✔
	97.0951 - 96.0476	0.010	1.171	0.000	0.067	0.004	1.183 ✔	1.333	H1-3+VT ✔
	96.0476 - 95	0.010	1.197	0.000	0.067	0.004	1.208 ✔	1.333	H1-3+VT ✔
	95 - 91.75	0.005	0.620	0.000	0.033	0.002	0.625 ✔	1.333	H1-3+VT ✔
L3	95 - 91.75	0.004	0.532	0.000	0.027	0.001	0.537 ✔	1.333	H1-3+VT ✔
	91.75 - 90.6805	0.008	1.057	0.000	0.053	0.003	1.066 ✔	1.333	H1-3+VT ✔
	90.6805 - 89.611	0.009	1.075	0.000	0.055	0.001	1.085 ✔	1.333	H1-3+VT ✔
	89.611 - 88.5415	0.009	1.094	0.000	0.055	0.001	1.103 ✔	1.333	H1-3+VT ✔
	88.5415 - 87.472	0.009	1.111	0.000	0.054	0.001	1.121 ✔	1.333	H1-3+VT ✔
	87.472 - 86.4025	0.009	1.129	0.000	0.054	0.001	1.138 ✔	1.333	H1-3+VT ✔
	86.4025 - 85.333	0.009	1.145	0.000	0.054	0.001	1.155 ✔	1.333	H1-3+VT ✔
L4	85.333 - 83.9165	0.007	0.884	0.000	0.040	0.001	0.892 ✔	1.333	H1-3+VT ✔
	83.9165 - 82.5	0.007	0.900	0.000	0.040	0.001	0.907 ✔	1.333	H1-3+VT ✔
L5	82.5 - 81.4333	0.008	1.002	0.000	0.044	0.001	1.010 ✔	1.333	H1-3+VT ✔
	81.4333 - 80.3667	0.008	1.013	0.000	0.044	0.001	1.022 ✔	1.333	H1-3+VT ✔
	80.3667 - 79.3	0.008	1.025	0.000	0.044	0.001	1.033 ✔	1.333	H1-3+VT ✔
	79.3 - 78.2334	0.008	1.036	0.000	0.044	0.001	1.045 ✔	1.333	H1-3+VT ✔
	78.2334 - 77.1667	0.008	1.047	0.000	0.044	0.001	1.056 ✔	1.333	H1-3+VT ✔
L6	77.1667 - 76.1167	0.008	1.081	0.000	0.045	0.001	1.090 ✔	1.333	H1-3+VT ✔
	76.1167 - 75.0668	0.008	1.092	0.000	0.045	0.001	1.101 ✔	1.333	H1-3+VT ✔
	75.0668 - 74.0168	0.008	1.102	0.000	0.045	0.001	1.111 ✔	1.333	H1-3+VT ✔
	74.0168 - 72.9668	0.008	1.111	0.000	0.044	0.001	1.120 ✔	1.333	H1-3+VT ✔
	72.9668 - 71.9168	0.009	1.121	0.000	0.044	0.001	1.130 ✔	1.333	H1-3+VT ✔
	71.9168 - 70.8669	0.009	1.130	0.000	0.044	0.001	1.139 ✔	1.333	H1-3+VT ✔
	70.8669 - 69.8169	0.009	1.139	0.000	0.044	0.001	1.148 ✔	1.333	H1-3+VT ✔
	69.8169 - 68.7669	0.009	1.148	0.000	0.044	0.001	1.157 ✔	1.333	H1-3+VT ✔

tnxTower	Job	Page
	77969 .011.001 - East Farmington, CT (BU# 876335)	27 of 29
BT Engineering 1717 S. Boulder, Ste 300 Tulsa, OK 74132 Phone: (918) 587 - 4630 FAX: (918) 295 - 0265	**Project** 140' Summit Monopole	**Date** 18:46:27 02/10/14
	Client Crown Castle	**Designed by** B. Tabb

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	68.7669 - 67.717	0.009	1.156	0.000	0.044	0.001	1.166 ✓	1.333	H1-3+VT ✓
	67.717 - 66.667	0.009	1.165	0.000	0.044	0.001	1.174 ✓	1.333	H1-3+VT ✓
L7	66.667 - 65.5558	0.010	1.270	0.000	0.048	0.001	1.280 ✓	1.333	H1-3+VT ✓
	65.5558 - 64.4447	0.010	1.279	0.000	0.047	0.001	1.289 ✓	1.333	H1-3+VT ✓
	64.4447 - 63.3335	0.010	1.288	0.000	0.047	0.001	1.298 ✓	1.333	H1-3+VT ✓
	63.3335 - 62.2223	0.010	1.296	0.000	0.047	0.001	1.307 ✓	1.333	H1-3+VT ✓
	62.2223 - 61.1112	0.010	1.304	0.000	0.047	0.001	1.315 ✓	1.333	H1-3+VT ✓
	61.1112 - 60	0.010	1.312	0.000	0.047	0.001	1.323 ✓	1.333	H1-3+VT ✓
L8	60 - 59	0.010	1.342	0.000	0.048	0.001	**1.353** ✗	1.333	H1-3+VT ✗
	59 - 58	0.010	1.349	0.000	0.048	0.001	**1.360** ✗	1.333	H1-3+VT ✗
	58 - 57	0.011	1.355	0.000	0.047	0.001	**1.366** ✗	1.333	H1-3+VT ✗
	57 - 56	0.011	1.362	0.000	0.047	0.001	**1.373** ✗	1.333	H1-3+VT ✗
	56 - 55	0.011	1.368	0.000	0.047	0.001	**1.379** ✗	1.333	H1-3+VT ✗
	55 - 54	0.011	1.374	0.000	0.047	0.001	**1.386** ✗	1.333	H1-3+VT ✗
	54 - 53	0.011	1.380	0.000	0.047	0.001	**1.392** ✗	1.333	H1-3+VT ✗
	53 - 52	0.011	1.386	0.000	0.047	0.001	**1.397** ✗	1.333	H1-3+VT ✗
	52 - 51	0.011	1.392	0.000	0.047	0.001	**1.403** ✗	1.333	H1-3+VT ✗
	51 - 46.5	0.006	0.696	0.000	0.024	0.000	0.702 ✓	1.333	H1-3+VT ✓
L9	51 - 46.5	0.006	0.672	0.000	0.021	0.000	0.678 ✓	1.333	H1-3+VT ✓
	46.5 - 45.375	0.011	1.328	0.000	0.043	0.001	**1.340** ✗	1.333	H1-3+VT ✗
	45.375 - 44.25	0.011	1.333	0.000	0.043	0.001	**1.344** ✗	1.333	H1-3+VT ✗
L10	44.25 - 43.2188	0.009	1.130	0.000	0.036	0.000	1.139 ✓	1.333	H1-3+VT ✓
	43.2188 - 42.1875	0.009	1.133	0.000	0.036	0.000	1.143 ✓	1.333	H1-3+VT ✓
	42.1875 - 41.1563	0.009	1.136	0.000	0.035	0.000	1.146 ✓	1.333	H1-3+VT ✓
	41.1563 - 40.125	0.009	1.140	0.000	0.035	0.000	1.149 ✓	1.333	H1-3+VT ✓
	40.125 - 39.0938	0.009	1.143	0.000	0.035	0.000	1.152 ✓	1.333	H1-3+VT ✓
	39.0938 - 38.0625	0.010	1.146	0.000	0.035	0.000	1.155 ✓	1.333	H1-3+VT ✓
	38.0625 - 37.0313	0.010	1.148	0.000	0.035	0.000	1.158 ✓	1.333	H1-3+VT ✓
	37.0313 - 36	0.010	1.151	0.000	0.035	0.000	1.161 ✓	1.333	H1-3+VT ✓
	36 - 34.9688	0.010	1.154	0.000	0.035	0.000	1.164 ✓	1.333	H1-3+VT ✓
	34.9688 - 33.9375	0.010	1.157	0.000	0.035	0.000	1.167 ✓	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	33.9375 - 32.9063	0.010	1.159	0.000	0.035	0.000	1.169 ✓	1.333	H1-3+VT ✓
	32.9063 - 31.875	0.010	1.162	0.000	0.035	0.000	1.172 ✓	1.333	H1-3+VT ✓
	31.875 - 30.8438	0.010	1.164	0.000	0.035	0.000	1.174 ✓	1.333	H1-3+VT ✓
	30.8438 - 29.8125	0.010	1.166	0.000	0.035	0.000	1.177 ✓	1.333	H1-3+VT ✓
	29.8125 - 28.7813	0.010	1.169	0.000	0.035	0.000	1.179 ✓	1.333	H1-3+VT ✓
	28.7813 - 27.75	0.010	1.171	0.000	0.035	0.000	1.181 ✓	1.333	H1-3+VT ✓
L11	27.75 - 26.5277	0.010	1.184	0.000	0.035	0.000	1.195 ✓	1.333	H1-3+VT ✓
	26.5277 - 25.3053	0.010	1.187	0.000	0.035	0.000	1.198 ✓	1.333	H1-3+VT ✓
	25.3053 - 24.083	0.010	1.189	0.000	0.035	0.000	1.200 ✓	1.333	H1-3+VT ✓
L12	24.083 - 23.083	0.013	1.435	0.000	0.042	0.000	**1.448** ✗	1.333	H1-3+VT ✗
	23.083 - 22.083	0.013	1.437	0.000	0.042	0.000	**1.450** ✗	1.333	H1-3+VT ✗
	22.083 - 21.083	0.013	1.439	0.000	0.042	0.000	**1.453** ✗	1.333	H1-3+VT ✗
	21.083 - 20.083	0.013	1.441	0.000	0.042	0.000	**1.455** ✗	1.333	H1-3+VT ✗
	20.083 - 19.083	0.013	1.443	0.000	0.042	0.000	**1.457** ✗	1.333	H1-3+VT ✗
	19.083 - 18.083	0.013	1.445	0.000	0.041	0.000	**1.459** ✗	1.333	H1-3+VT ✗
L13	18.083 - 17.0784	0.011	1.163	0.000	0.033	0.000	1.174 ✓	1.333	H1-3+VT ✓
	17.0784 - 16.0738	0.011	1.164	0.000	0.033	0.000	1.175 ✓	1.333	H1-3+VT ✓
	16.0738 - 15.0692	0.011	1.166	0.000	0.033	0.000	1.176 ✓	1.333	H1-3+VT ✓
	15.0692 - 14.0646	0.011	1.167	0.000	0.033	0.000	1.178 ✓	1.333	H1-3+VT ✓
	14.0646 - 13.0599	0.011	1.168	0.000	0.033	0.000	1.179 ✓	1.333	H1-3+VT ✓
	13.0599 - 12.0553	0.011	1.169	0.000	0.033	0.000	1.180 ✓	1.333	H1-3+VT ✓
	12.0553 - 11.0507	0.011	1.171	0.000	0.033	0.000	1.182 ✓	1.333	H1-3+VT ✓
	11.0507 - 10.0461	0.011	1.172	0.000	0.033	0.000	1.183 ✓	1.333	H1-3+VT ✓
	10.0461 - 9.0415	0.011	1.173	0.000	0.033	0.000	1.184 ✓	1.333	H1-3+VT ✓
	9.0415 - 8.03689	0.011	1.174	0.000	0.033	0.000	1.185 ✓	1.333	H1-3+VT ✓
	8.03689 - 7.03228	0.011	1.175	0.000	0.033	0.000	1.186 ✓	1.333	H1-3+VT ✓
	7.03228 - 6.02767	0.011	1.176	0.000	0.032	0.000	1.187 ✓	1.333	H1-3+VT ✓

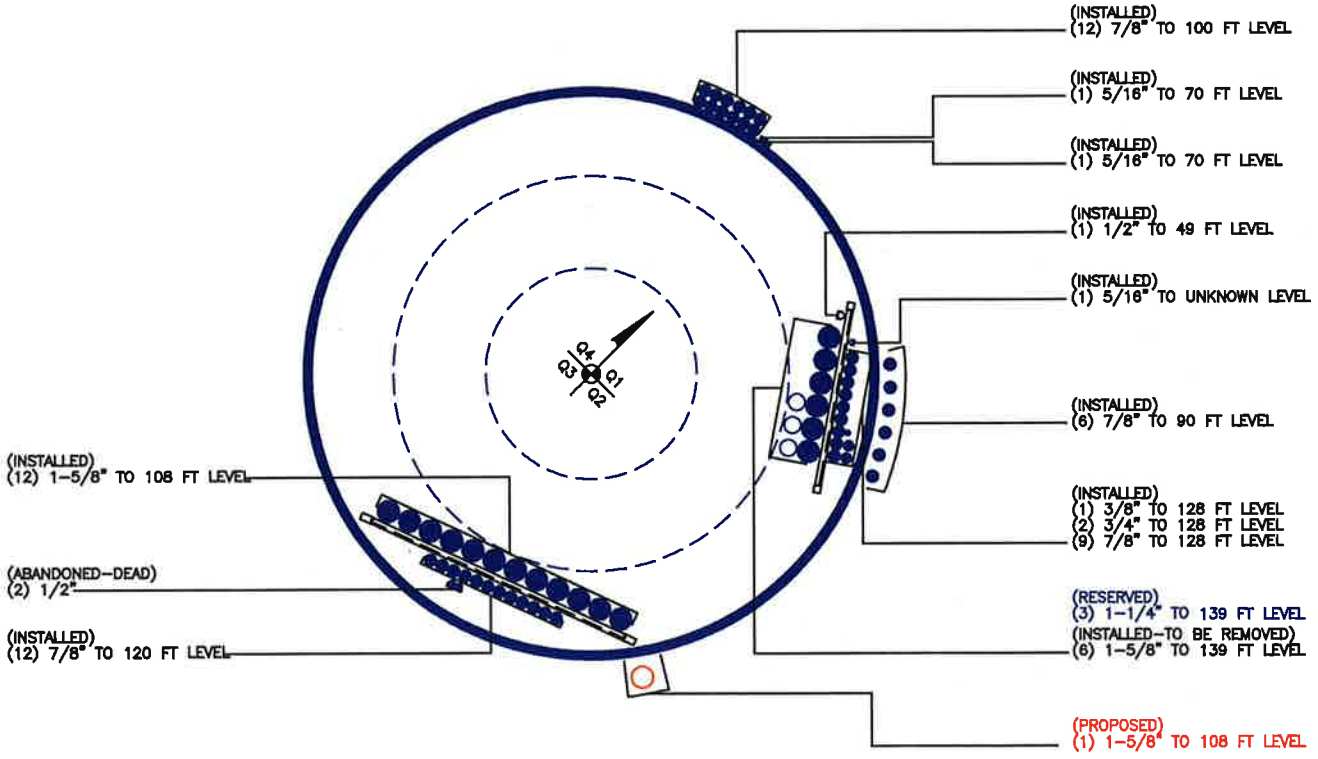
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	6.02767 - 5.02306	0.011	1.177	0.000	0.032	0.000	1.188 ✔	1.333	H1-3+VT ✔
	5.02306 - 4.01844	0.011	1.178	0.000	0.032	0.000	1.189 ✔	1.333	H1-3+VT ✔
	4.01844 - 3.01383	0.011	1.179	0.000	0.032	0.000	1.190 ✔	1.333	H1-3+VT ✔
	3.01383 - 2.00922	0.011	1.180	0.000	0.032	0.000	1.191 ✔	1.333	H1-3+VT ✔
	2.00922 - 1.00461	0.011	1.180	0.000	0.032	0.000	1.192 ✔	1.333	H1-3+VT ✔
	1.00461 - 0	0.011	1.181	0.000	0.032	0.000	1.193 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	140 - 102.333	Pole	TP23.721x16x0.25	1	-8.154	906.684	98.4	Pass
L2	102.333 - 91.75	Pole	TP25.89x23.721x0.376	2	-9.405	1266.550	86.8	Pass
L3	91.75 - 85.333	Pole	TP26.706x24.724x0.422	3	-11.590	1716.051	91.8	Pass
L4	85.333 - 82.5	Pole	TP27.287x26.706x0.601	4	-12.152	2344.747	74.1	Pass
L5	82.5 - 77.1667	Pole	TP28.38x27.287x0.527	5	-13.245	2207.568	91.0	Pass
L6	77.1667 - 66.667	Pole	TP30.534x28.38x0.512	6	-15.710	2323.192	89.2	Pass
L7	66.667 - 60	Pole	TP31.901x30.534x0.508	7	-17.111	2243.412	95.1	Pass
L8	60 - 46.5	Pole	TP34.67x31.901x0.505	8	-19.248	2334.509	93.4	Pass
L9	46.5 - 44.25	Pole	TP34.506x33.122x0.554	9	-21.778	2658.668	96.6	Pass
L10	44.25 - 27.75	Pole	TP37.89x34.506x0.652	10	-26.557	3481.183	89.4	Pass
L11	27.75 - 24.083	Pole	TP38.642x37.89x0.645	11	-27.665	3516.534	90.7	Pass
L12	24.083 - 18.083	Pole	TP39.872x38.642x0.551	12	-29.565	2998.290	98.3	Pass
L13	18.083 - 0	Pole	TP43.58x39.872x0.626	13	-35.244	4100.215	98.0	Pass
							Summary	
						Pole (L1)	98.4	Pass
						RATING =	**98.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

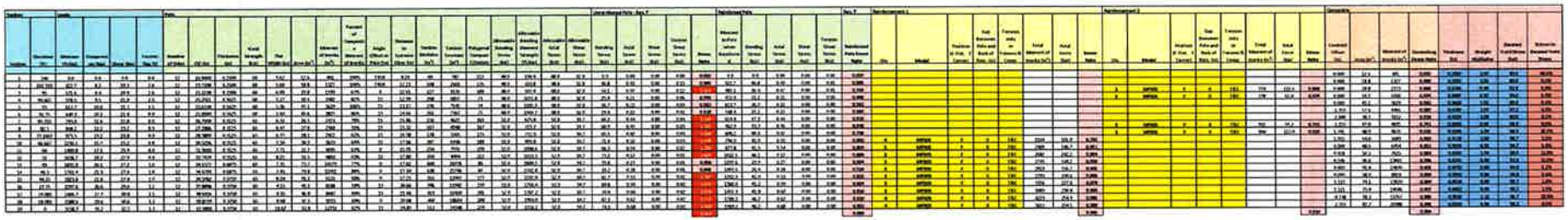


BUSINESS UNIT: 876335 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforced Pole Stress
and Effective Thickness Check



Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	18.083	4	MP305	F	T&C
18.083	24.083	4	MP305	F	T&C
24.083	44.25	3	MP305	F	T&C
44.25	66.667	3	MP305	F	T&C
66.667	77.1667	4	MP303	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1				1			1		1								
1				1				1		1							
1				1				1									
	1				1				1								
	1	1			1				1								

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
77.1667	85.333	3	MP303	F	T&C
94.667	102.333	3	MP303	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		1				1				1							
			1				1				1						

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0	27.75	1	CI 1.25x6.5	F	T&C
24.083	44.25	2	CCI 1x6	F	T&C
49	60	1	CCI 1x6	F	T&C
66.667	82.5	2	CCI 1x6	F	T&C
82.5	93	2	CCI 1x6	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
					1												
		1				1											
			1														
			1				1										
				1				1									

AeroSolutions LLC
Optimizing Your Tower Infrastructure
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
MP303	9.9	2.92	0.66	6.57	0.59	0	0.30	4.06	1.57	0.64	1.21875	65	80	0.80	18	1.00	18	95.4	128.6	Rupture	144.7	Rupture
MP304	14.1	4.13	0.91	11.86	0.61	0	0.43	4.78	1.61	0.84	1.21875	65	80	0.80	18	1.00	18	137.3	183.1	Rupture	206.0	Rupture
MP305	19.2	5.65	2.15	20.79	0.79	0	0.5	5.33	2.09	0.91	1.21875	65	80	0.80	18	1.00	18	194.5	259.3	Rupture	291.8	Rupture
MP306	28.8	8.47	4.95	52.50	0.93	0	0.64	6.89	2.61	1.01	1.21875	65	80	0.80	24	1.00	24	298.7	398.3	Rupture	448.1	Rupture
CCI 1x4.5	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
CCI 1x6	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16	1.00	16	188.8	251.7	Rupture	283.1	Rupture
CCI 1.25x6.5	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture
CCI 1.25x8.5	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.21875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	541.4	Rupture

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	876335
Name:	EAST FARMINGTON
App. #:	201483 Rev: 1

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	3159	ft-kip
Axial:	35	kip
Shear:	32	kip
Base Plate Type:	Square	

Design Information	
TIA Code:	F
ASIF:	1.333
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data		
Quantity:	12	
Diameter:	2.25	in
Material:	#18J	
Bolt Circle:	51.0	in
Bolt Spacing:	6	in
Bolt Group Area:	47.71	in^2
Bolt Group MOIx:	15531	in^4

Reactions Seen by Original AR Group		
Moment:	2370.0	kip-ft
Axial:	35.2	kip
Shear:	32.5	kip

Original AR Capacity Check		
Tension Load:	187.3	kip
Allowable load:	194.8	kip
AR Capacity:	96.1%	Pass

First Added Anchor Rod Data		
Quantity:	6	
Diameter:	1.75	in
Material:	A193 B7	
Bolt Circle:	54.1	in
Bolt Group Area:	14.43	in^2
Bolt Group MOIx:	5169	in^4

Reactions Seen by First Added AR Group		
Moment:	788.7	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check		
Tension Load:	121.2	kip
Allowable load:	132.3	kip
AR Capacity:	91.6%	Pass

Second Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

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#: *876335*
Site Name: *EAST FARMINGTON*
App #: *201483 Rev: 1*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	49.5	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	43.58	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

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

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2369.99554	ft-kips
Unfactored Axial, P:	35.2437	kips
Unfactored Shear, V:	32.457731	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	182.9 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	93.8% **Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	45.5 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	91.1% **Pass**

PL Ref. Data	
Yield Line (in):	26.42
Max PL Length:	26.42

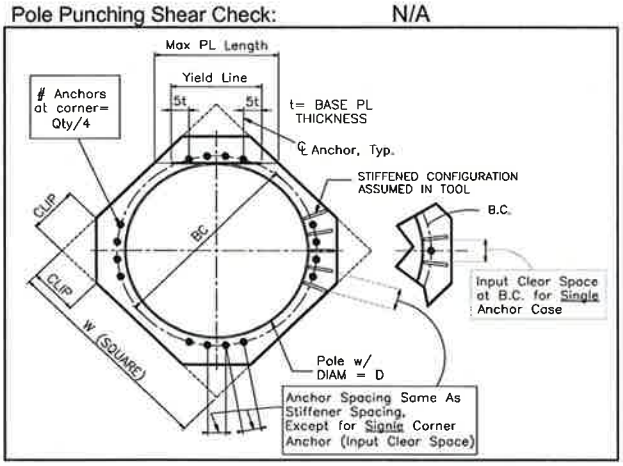
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A



Micropile Foundation Modification

Diameter	8	in
Circumfere	50	in

Top of Layer	Bottom of Layer	Layer Thickness (ft)	Skin Friction (psi)	Force (k)
9	19	10	0	0
19	23	4	30	72
23	26	3	250	452
26	30	4	0	0
30	41	11	0	0

Ultimate Uplift	525	k
Allowable Uplift	262.4	k
y	9	ft
Mn/Ω*1.33	6282	k-ft
Mu	3159	k-ft
Unity	**50.3%**	

Bar	1.75	in
Min. Ult Yield Capacity	312	k
>	262	k
Good		

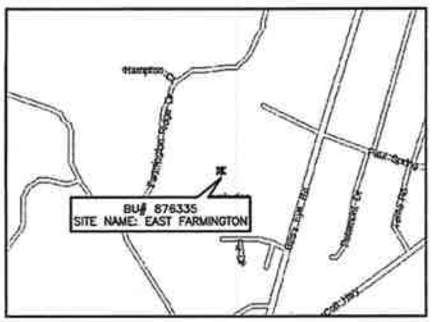
APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS

SITE NAME: EAST FARMINGTON
BU NUMBER: 876335

SITE ADDRESS:
3 A BIRDSEYE ROAD
FARMINGTON, CT 06030
HARTFORD COUNTY, USA



MAP

DIRECTIONS

FROM HARTFORD, TAKE EXIT 84 WEST TO EXIT 37, EXIT ONTO FIENEMANO ROAD. TURN LEFT, GO TO STOP LIGHT & STAY STRAIGHT ON ROAD THROUGH LIGHT. NOW YOU WILL BE ON BIRDSEYE ROAD. GO UP 1/2 MILE AND MONOPOLE IS ON YOUR LEFT.

PROJECT CONTACTS:

1. CROWN TOWER STRUCTURAL ANALYST
   ANDREW BAZINET
   (585) 899-3442
   ANDREW.BAZINET @CROWNCASTLE.COM
   46 BROADWAY
   ALBANY, NY 12204

2. B+T GROUP PROJECT ENGINEER
   BRADEN TABB, E.I.
   (918) 587-4630
   BTABB@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119

3. B+T GROUP ENGINEER (EOR)
   CHAD E TUTTLE, P.E.
   (918) 587-4630
   CTUTTLE@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119

TOWER INFORMATION

TOWER MANUFACTURER:	SUMMIT MANUFACTURING, INC.
TOWER HEIGHT / TYPE:	140' MONOPOLE
TOWER LOCATION: DATUM: (NAD 1983)	LAT. 41° 42' 56.94" LONG. -72° 48' 37.42" ELEV. 414 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 691610
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO # 673189
STRUCTURAL ANALYSIS DATE:	10/02/13
APPLICATION ID / REVISION #:	201483 / 1
CCISITES DOCUMENT ID:	4089352

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 38 MPH WITH 1.0 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, AJAX BOLT NOTES AND DETAIL
S4	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S5	SITE PLAN
S6	FOUNDATION MODIFICATION AND NOTES
S7	TOWER SECTIONS (0'–30.5', 21.5'–46.5', 47'–62', 64.5'–84.5' AND 80'–95')
D1	DETAILS

B+T GRP
1717 S BOULDER AVE
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77909.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER
2/10/14

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

EAST FARMINGTON
876335
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

SHEET TITLE: TITLE SHEET

SHEET NUMBER: S1
REVISION: 0

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MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ASSEMBLY DRAWINGS	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE, PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
X	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10066, ENG-STD-10069 AND SRV-STD-10159. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

B+T GRP
1717 S. BOULDER AVE
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ PROFESSIONAL ENGINEER ★ No. 23924 LICENSED

2/10/14

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

EAST FARMINGTON
876335

3 A BIRDSEYE ROAD
FARMINGTON, CT

EXISTING 140' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER: S2
REVISION: 0

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF HRC 38 OR HIGHER.

5. AS AN ALTERNATIVE TO USING DTI WASHERS, AJAX BOLTS MAY BE PRETENSIONED PER AISC TURN-OF-NUT METHOD.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURES'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD
BELLOWS FALLS, VERMONT 05101, USA
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRUBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

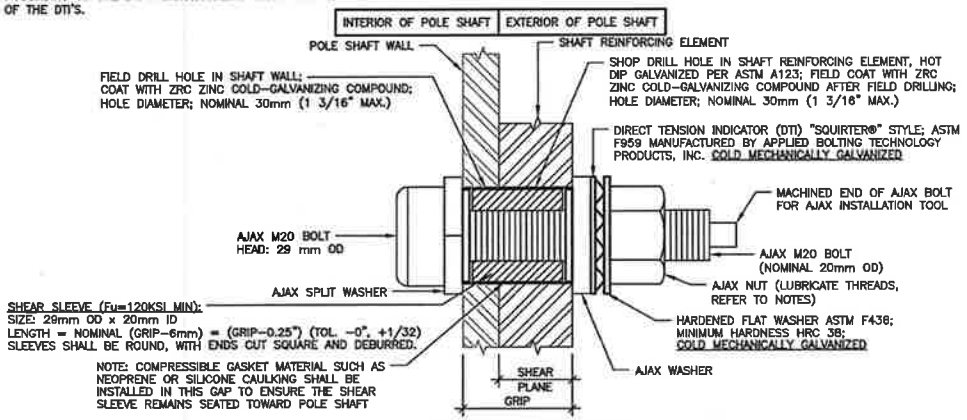
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF HRC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF HRC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 32, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



1 TYPICAL AJAX BOLT DETAIL
SCALE: N.T.S.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572
B. STEEL PIPE	35ksi	A53-B

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

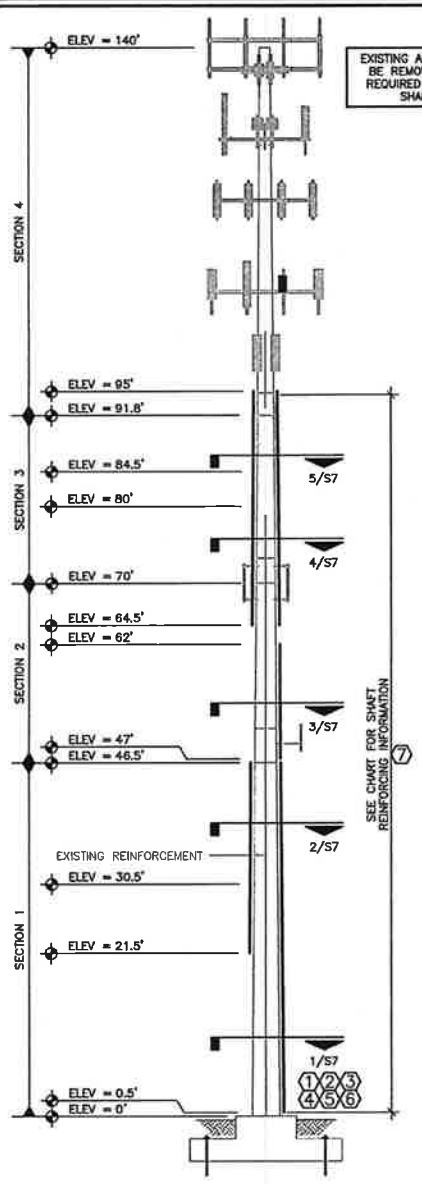
B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
2/10/14

EAST FARMINGTON
876335
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

SHEET TITLE
GENERAL NOTES, AJAX BOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S3	0



1 TOWER ELEVATION
SCALE: N.T.S.

EXISTING ANTENNA MOUNTS SHALL BE REMOVED AND MODIFIED AS REQUIRED FOR INSTALLATION OF SHAFT REINFORCING.

CCI: FLAT PLATE-BILL OF MATERIALS (65KSI)

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	AJAX BOLTS PER PLATE	TOTAL AJAX BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
0'-6"	30'-6"	CCI-SFP-06512530	30'-0"	1	37	37	11	11	19	829	LBS.
21'-6"	46'-6"	CCI-SFP-06010025	25'-0"	2	31	62	8	8	16	1021	LBS.
47'-0"	62'-0"	CCI-SFP-06010015	15'-0"	1	24	24	8	8	16	306	LBS.
64'-6"	84'-6"	CCI-SFP-06010020	20'-0"	2	27	54	8	8	16	817	LBS.
80'-0"	95'-0"	CCI-SFP-06010015	15'-0"	2	24	48	8	8	16	613	LBS.
						177				2973	LBS.

NOTES:
1. AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
3. ALL SHIMS SHALL BE ASTM A36.
4. HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
5. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
6. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
7. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
8. WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

NEW CCI FLAT PLATE (65KSI) REINFORCING ELEMENTS

START ELEVATION	END ELEVATION	QTY	FLAT #	FLAT PLATE *
0.5'	30.5'	1	10	CCI-SFP-06512530
21.5'	46.5'	2	7 & 11	CCI-SFP-06010025
47'	62'	1	8	CCI-SFP-06010015
64.5'	84.5'	2	8 & 12	CCI-SFP-06010020
80'	95'	2	1 & 9	CCI-SFP-06010015

* SEE CMRP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER
1	12	0.375"	43.580"	33.122"
2	12	0.313"	34.670"	28.380"
3	12	0.313"	28.380"	24.724"
4	12	0.250"	25.870"	16.000"

TOWER MODIFICATIONS:

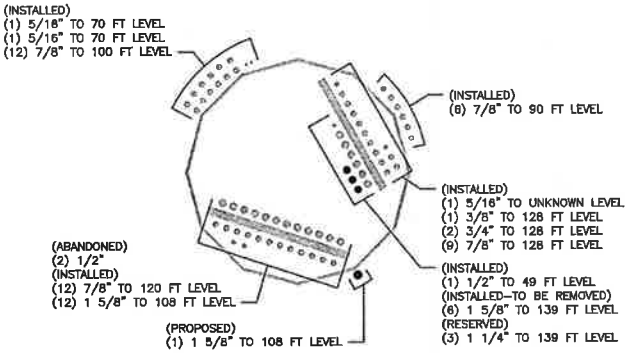
1. CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
2. THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S4.
3. MODIFY EXISTING FOUNDATION RE: SHEET S5 AND S6.
4. INSTALL NEW ANCHOR RODS, ANCHOR ROD BRACKETS AND FOOTPADS RE: SHEET S7.
5. INSTALL NEW TRANSITION STIFFENERS RE: SHEET S7.
6. INSTALL NEW GROUT BENEATH EXISTING BASE PLATE RE: SHEET S7.
7. INSTALL NEW REINFORCING ELEMENTS RE: SHEET S7.

* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T ENGINEERING DATED 12/09/08

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T ENGINEERING DATED 07/10/12

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T GROUP DATED 04/30/13



2 TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE.
SUITE 900
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77999.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

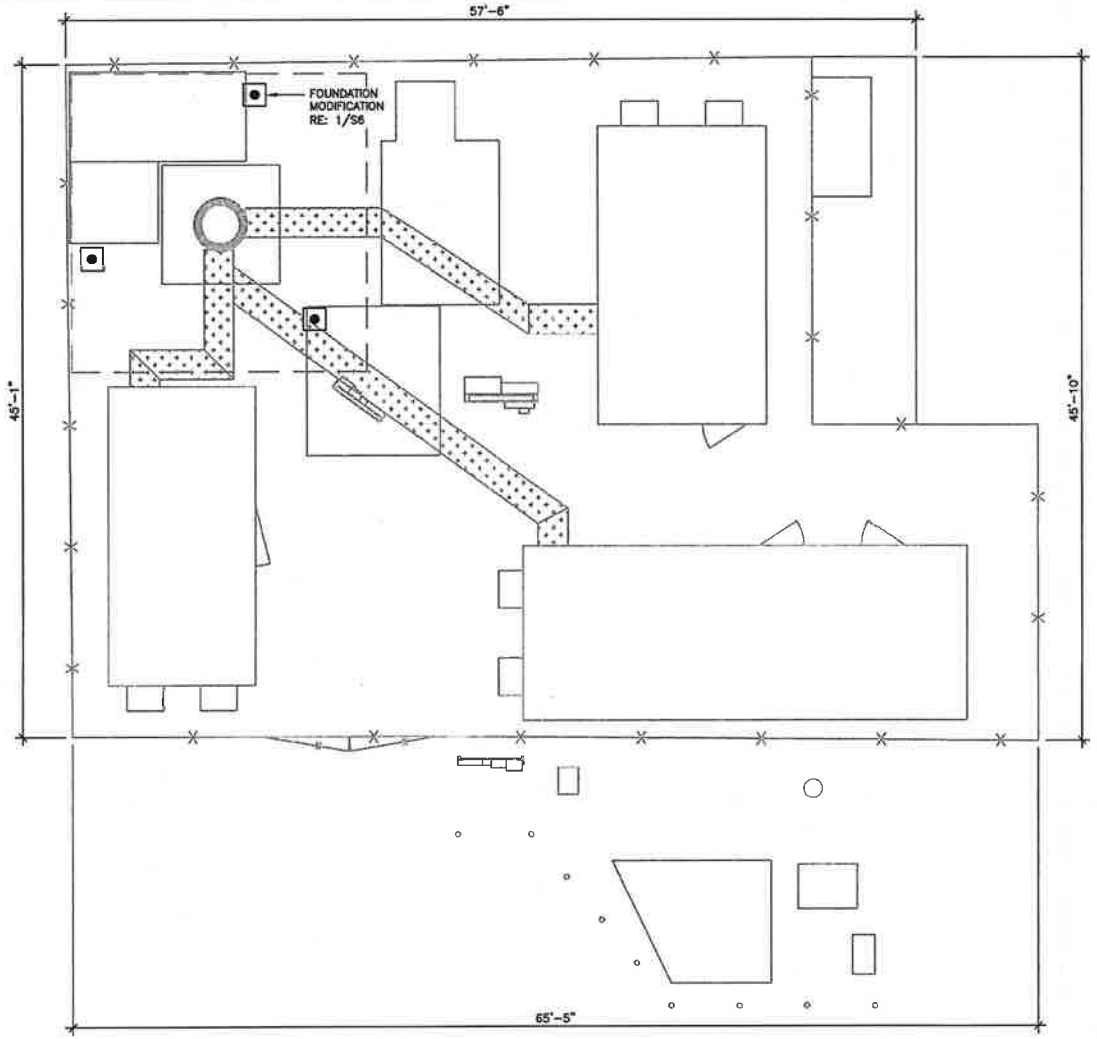
B+T ENGINEERING, INC.

STATE OF CONNECTICUT
BRAD TABB
No. 23924
LICENSED
PROFESSIONAL ENGINEER
2/10/14

EAST FARMINGTON
876335
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES, AND TX LINE DIST. DIAGRAM

SHEET NUMBER:	REVISION:
S4	0



1 SITE PLAN
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77999.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
2/10/14

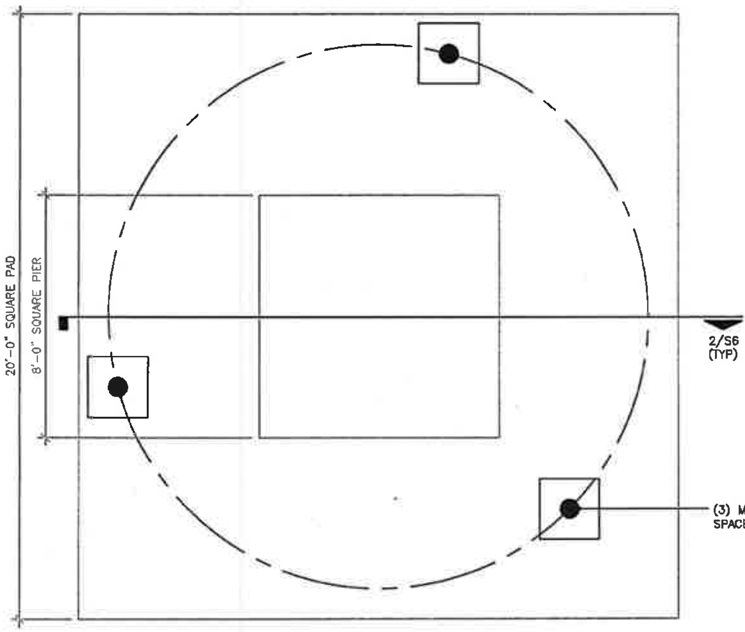
EAST FARMINGTON
876335

3 A BIRDSEYE ROAD
FARMINGTON, CT

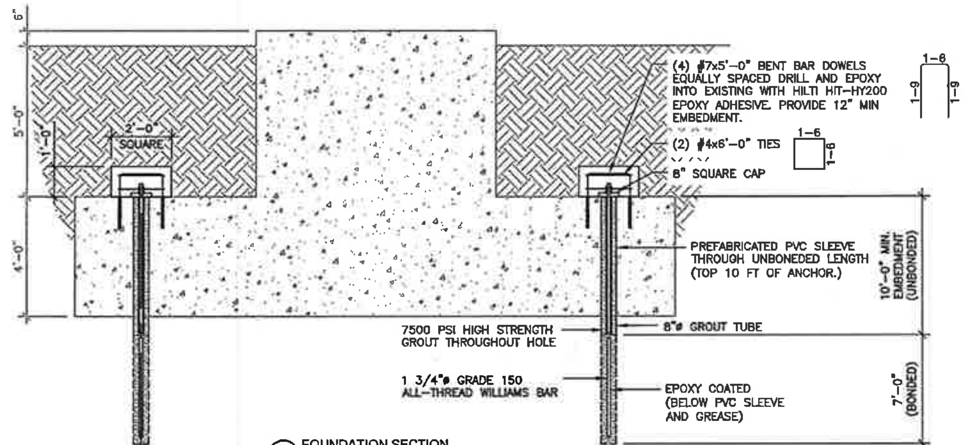
EXISTING 140' MONOPOLE

SHEET TITLE
SITE PLAN

SHEET NUMBER:	REVISION:
S5	0



1 FOUNDATION MODIFICATION
SCALE: N.T.S.



2 FOUNDATION SECTION
SCALE: N.T.S.

ROCK ANCHOR NOTES:

1. ANCHOR RODS SHALL BE GRADE 150 ALL-THREAD, EPOXY COATED BAR WITH PREFABRICATED, GREASED PVC SLEEVE THROUGH THE STRESSING LENGTH. THE PROPERTIES OF THE BARS SHALL BE: Fy=128ksi, Fu=150ksi.
2. CONTRACTOR SHALL FULLY GROUT THE DRILL HOLE THROUGH A GROUT TUBE RUNNING TO THE BOTTOM OF THE DRILL HOLE UNTIL CLEAN GROUT RETURNS TO THE SURFACE OF THE DRILL HOLE.
3. USE BAR CENTRALIZERS TO POSITION THE BAR IN THE HOLE.

FOUNDATION DESIGN CRITERIA:

1. TOWER REACTIONS PROVIDED BY:
   -B+T GROUP (STRUCTURAL ANALYSIS REPORT)
   -ALLOWABLE CAPACITIES (NO 1/3 INCREASE)
   UPLIFT = 262 kips
2. FOUNDATIONS DESIGNED IN ACCORDANCE WITH TIA/EIA-222F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES. CONCRETE DESIGNED IN ACCORDANCE WITH ACI 318.
3. THESE FOUNDATIONS HAVE BEEN DESIGNED SPECIFICALLY FOR THE TOWER AND SOIL CONDITIONS REFERENCED ABOVE. IF ANYTHING DIFFERS THIS DESIGN SHALL BE CONSIDERED INVALID AND MUST BE REDESIGNED PRIOR TO CONSTRUCTION.

GENERAL:

1. ALL WORK SHALL COMPLY LOCAL CODES, SAFETY REGULATIONS AND UNLESS NOTED OTHERWISE, THE MOST RECENT EDITION OF ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
2. IF ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS AND OR CONDITIONS SPECIFIED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY WORK THAT WOULD BE AFFECTED.
3. THE CONTRACTOR SHALL EMPLOY ALL NECESSARY MEASURES TO PROTECT EXISTING STRUCTURES, FOUNDATIONS AND UTILITIES DURING EXCAVATION AND CONSTRUCTION OF THE FOUNDATIONS.

CONCRETE NOTES:

1. ALL DETAILING, FABRICATION AND PLACING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE ACI DETAILING MANUAL SP-66 (LATEST REVISION).
2. REINFORCING BARS SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM SPECIFICATION A615, EXCEPT TIES WHICH MAY BE ASTM A615 (GRADE 40). USE CLASS B LAP SPLICES.
3. ALL REINFORCING BARS SHALL BE TIED WITH TIE WIRE AT ALL REINFORCING BAR INTERSECTIONS. THE CONTRACTOR SHALL SUPPORT THE REINFORCING BAR MAT WITH CONTINUOUS STEEL CHAIRS SPACED NO MORE THAN FOUR FEET O.C.
4. ALL WATER SHALL BE REMOVED FROM THE BOTTOM OF THE EXCAVATION BEFORE COMPACTING FILL AND PLACING CONCRETE.
5. CONCRETE SHALL BE NORMAL WEIGHT AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
6. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL WHERE POSSIBLE. FORMS, WHEN REQUIRED SHALL BE REMOVED PRIOR TO BACKFILLING.
7. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM UNIT WEIGHT OF 100 PCF OR THE UNIT WEIGHT SPECIFIED IN THE GEOTECH REPORT.
8. FOR THE LESSER OF 25 C.Y. OR ONE DAY'S PLACEMENT, A MINIMUM OF 4 CONCRETE CYLINDERS SHALL BE TAKEN. CONCRETE SHALL BE TESTED AS REQUIRED BY OWNER'S PROJECT MANAGER.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77989.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

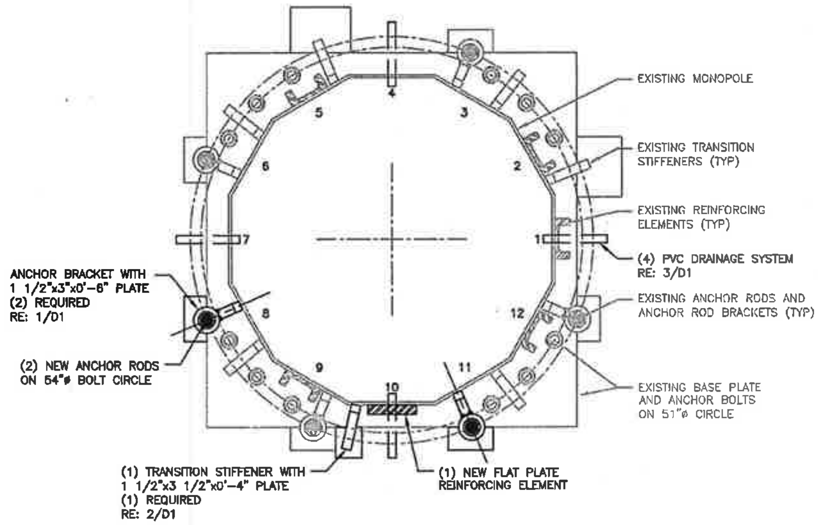
STATE OF CONNECTICUT ★ PROFESSIONAL ENGINEER ★ No. 23924 LICENSED 2/10/14

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

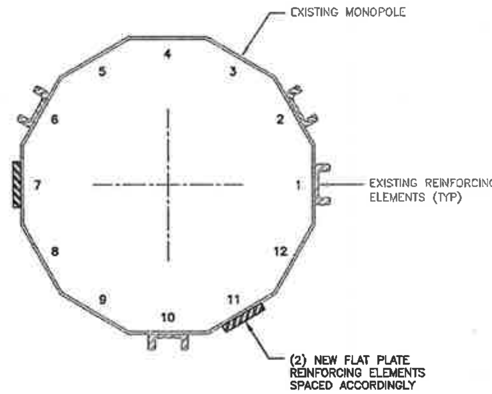
EAST FARMINGTON
876335
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

SHEET TITLE
FOUNDATION MODIFICATION AND NOTES

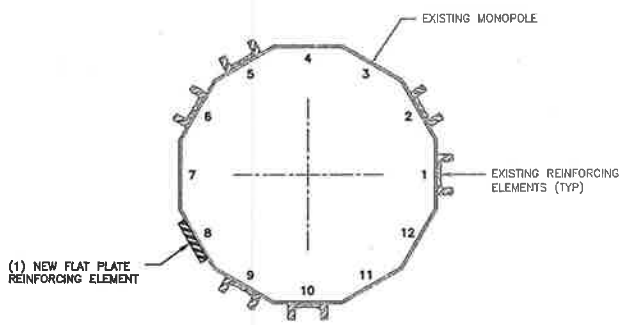
SHEET NUMBER: S6
REVISION: 0



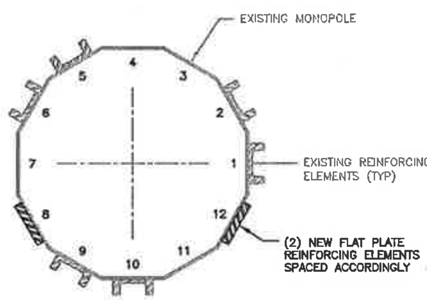
(1) TOWER SECTION (0'-30.5')
SCALE: N.T.S.



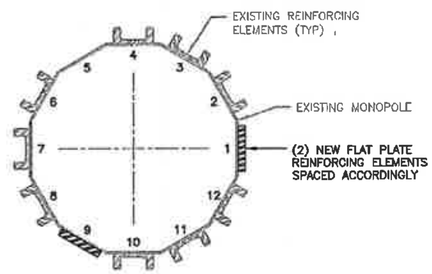
(2) TOWER SECTION (21.5'-46.5')
SCALE: N.T.S.



(3) TOWER SECTION (47'-62')
SCALE: N.T.S.



(4) TOWER SECTION (64.5'-84.5')
SCALE: N.T.S.



(5) TOWER SECTION (80'-95')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

2/10/14

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

EAST FARMINGTON
876335

3 A BIRDSEYE ROAD
FARMINGTON, CT

EXISTING 140' MONOPOLE

SHEET TITLE
TOWER SECTIONS
0'-30.5', 21.5'-46.5', 47'-62', 64.5'-84.5' AND 80'-95'

SHEET NUMBER:	REVISION:
S7	0

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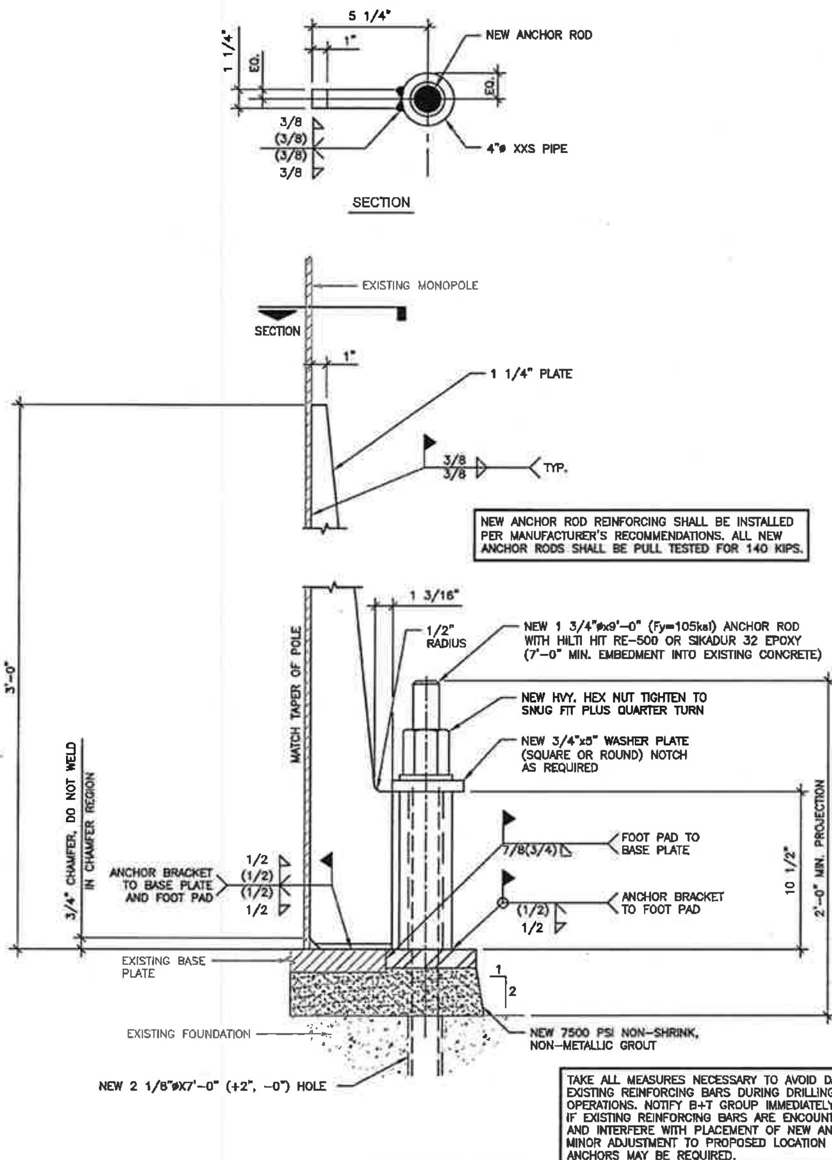
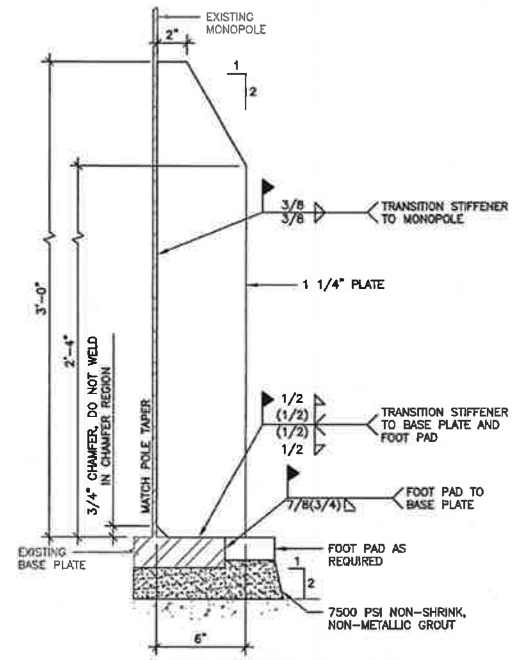


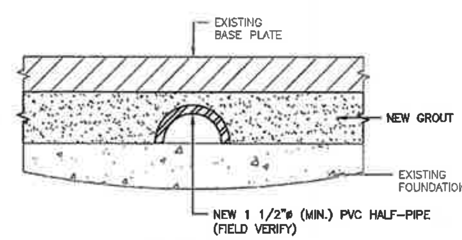
NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ALL NEW ANCHOR RODS SHALL BE PULL TESTED FOR 140 KIPS.

TAKE ALL MEASURES NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING DRILLING OPERATIONS. NOTIFY B+T GROUP IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.

1 ANCHOR ROD BRACKET
SCALE: N.T.S.



2 CCI-TRANSITION STIFFENER DETAIL
SCALE: N.T.S.



3 DRAIN PIPE DETAIL
SCALE: N.T.S

B+T GRP
1717 S. BOULDER AVE
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/10/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	77959.011.01
PROJECT ENG:	BRADEN TABB
DRAWN BY:	TEL
CHECKED BY:	JMF

B+T ENGINEERING, INC.

STATE OF CONNECTICUT · CHAD TUTTLE · No. 23924 · LICENSED · PROFESSIONAL ENGINEER · 2/10/14

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

EAST FARMINGTON
876335
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

SHEET TITLE
DETAILS

SHEET NUMBER: D1
REVISION: 0

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