Robinson+Cole

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Also admitted in Massachusetts

June 9, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
1197 Norwich Road, Plainfield, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level on an existing 149-foot monopole tower at 1197 Norwich Road in Plainfield, Connecticut (the "Property"). The tower is owned by Crown Castle. Cellco's use of the tower was approved by the Council in 2002. Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model BXA-80090-4CF, 850 MHz antennas; three (3) model HBXX-6517DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same 140-foot level on the tower. Cellco also intends to add six (6) remote radio heads ("RRHs"), one (1) each behind its 1900 MHz and 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Paul E. Sweet, First Selectman for the Town of Plainfield. A copy of this letter is also being sent to Plainfield Limited Inc., 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 installed on Cellco's existing antenna platform at the 140-foot level on the tower.

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

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table with Cellco's modified facility is included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Paul E. Sweet, Plainfield First Selectman
Plainfield Limited Inc.
Tim Parks

ATTACHMENT 1

BXA-80090-4CF-EDIN-X

X-Pol | FET Panel | 90° | 11.0 dBd

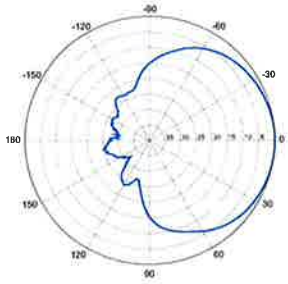
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics				
Frequency bands	806-900 MHz*			
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)			
Polarization	±45°			
Horizontal beamwidth	90°			
Vertical beamwidth	15°			
Gain	11.0 dBd (13.1 dBi)			
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14			
Impedance	50Ω			
VSWR	≤1.4:1			
Upper sidelobe suppression (0°)	-16.0 dB			
Front-to-back ratio (+/-30°)	-27.5 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	1206 x 204 x 151 mm		47.5 x 8.0 x 5.9 in	
Depth with z-brackets	191 mm		7.5 in	
Weight without mounting brackets	5.4 kg		12 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.25 m²	Side: 0.18 m²	Front: 2.6 ft²	Side: 1.9 ft²
Wind load @ 161 km/hr (100 mph)	Front: 356 N	Side: 283 N	Front: 80 lbf	Side: 61 lbf

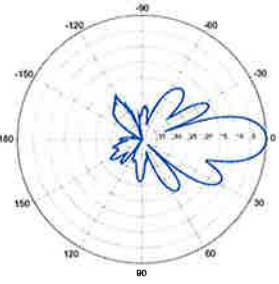
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit	36210006	40-115 mm 1.57-4.5 in	4.1 kg 9 lbs
Concealment Configurations	For concealment configurations, order BXA-80090-4CF-EDIN-X-FP		

BXA-80090-4CF-EDIN-X



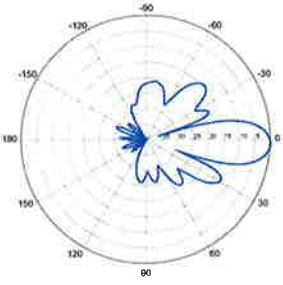
Horizontal

BXA-80090-4CF-EDIN-0



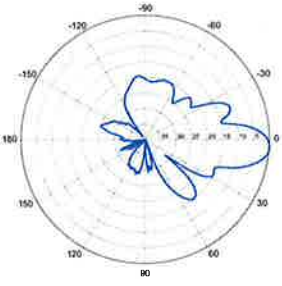
0° | Vertical

BXA-80090-4CF-EDIN-2



2° | Vertical

BXA-80090-4CF-EDIN-4

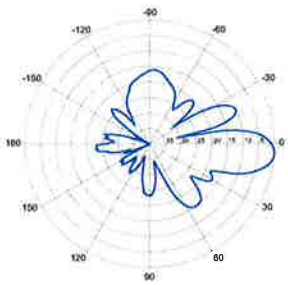


4° | Vertical

BXA-80090-4CF-EDIN-5

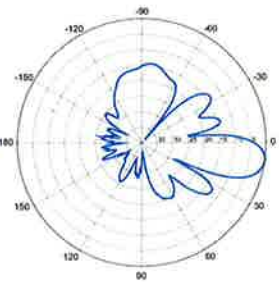
5° | Vertical

BXA-80090-4CF-EDIN-6



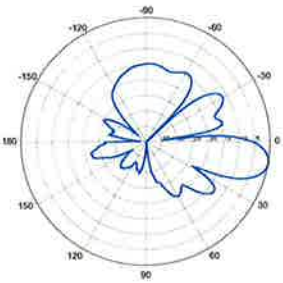
6° | Vertical

BXA-80090-4CF-EDIN-8



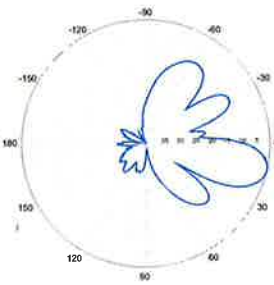
8° | Vertical

BXA-80090-4CF-EDIN-10



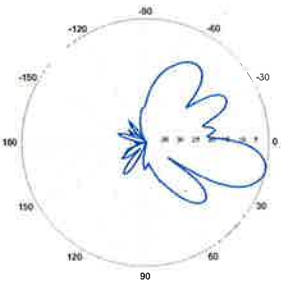
10° | Vertical

BXA-80090-4CF-EDIN-12



12° | Vertical

BXA-80090-4CF-EDIN-14



14° | Vertical

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4	0 ° | 18.4	0 ° | 18.7
	3 ° | 18.7	3 ° | 18.7	3 ° | 18.9
	6 ° | 18.4	6 ° | 18.5	6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

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

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

Product Specifications

HBXX-6517DS-VTM

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

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

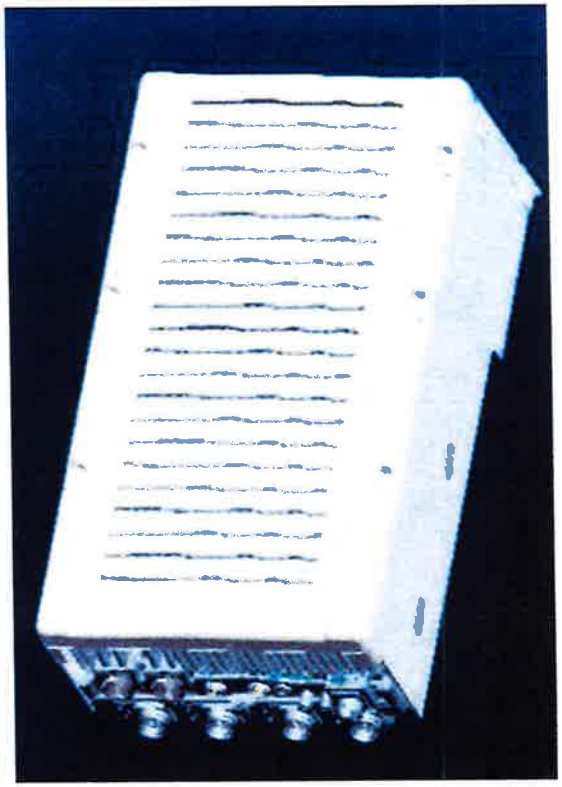
** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW

RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



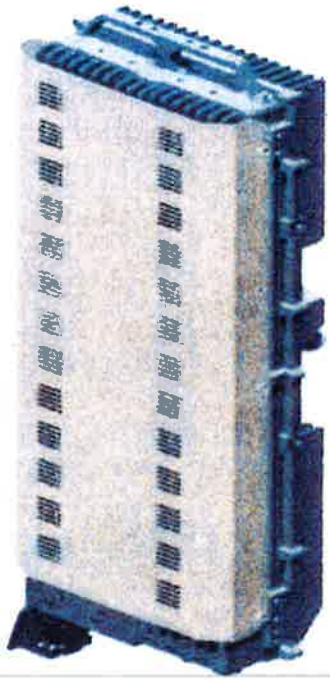
**- Includes solar shield but not mounting brackets (8 lbs.)

Alcatel·Lucent

ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET

RRH2x60-AWS FOR BAND 4 APPLICATIONS

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



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

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

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

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

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

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

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

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

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

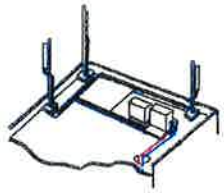
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

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

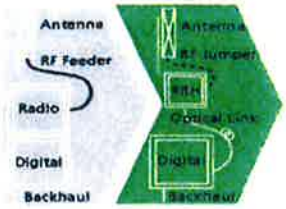
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

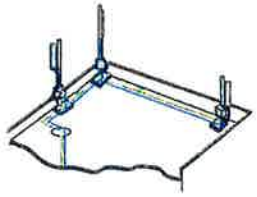
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control
- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

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

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

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

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

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

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

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

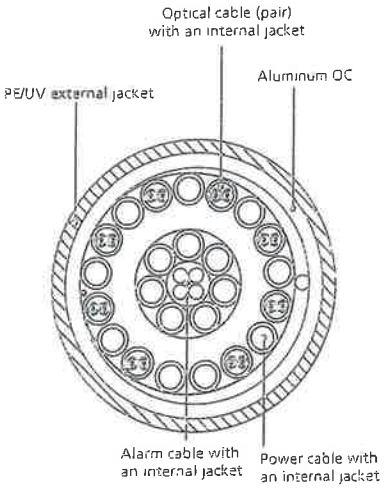


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Plainfield S								
Tower Height: 347ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*VoiceStream			150	0.0156	1930	1.0000	1.56%	
Verizon	**11**	**442**	**140**	**0.0892**	**1970**	**1.0000**	**8.92%**	
Verizon	**9**	**186**	**140**	**0.0307**	**869**	**0.5793**	**5.30%**	
Verizon	**1**	**2806**	**140**	**0.0515**	**2145**	**1.0000**	**5.15%**	
Verizon	**1**	**790**	**140**	**0.0145**	**746**	**0.4973**	**2.91%**	
								23.84%
* Source: Siting Council								

ATTACHMENT 3

Date: **April 15, 2015**

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Ste 2531
Akron, OH 44311
(614) 859-1607
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Andrew Bazinet
Crown Castle
3 Corporate Park Drive Suite 101
Clifton Park, NY 12065
(585) 370-4766

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	118593
	Carrier Site Name:	Plainfield South
Crown Castle Designation:	**Crown Castle BU Number:**	826747
	Crown Castle Site Name:	Plainfield/I-395
	Crown Castle JDE Job Number:	292274
	Crown Castle Work Order Number:	1041567
	Crown Castle Application Number:	244578 Rev. 4
Engineering Firm Designation:	**GPD Project Number:**	2015777.826747.01
Site Data:	**1197 Norwich Road, Plainfield, Windham County, CT 06234** **Latitude *41° 38' 46.766"*, Longitude *-71° 56' 28.698"*** **149 Foot – PiROD Monopole Tower**	

Dear Andrew Bazinet,

GPD is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 775439, in accordance with application 244578, revision 4.

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:

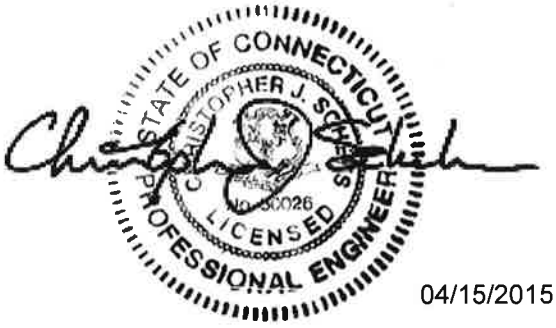
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

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

Structural analysis prepared by: Eric Schnaus, EI

Respectfully submitted by:



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

04/15/2015

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1) INTRODUCTION

The existing tower consists of five major sections connected by slip joints. It has an 18-sided cross section and is evenly tapered from 22.0663" (flat-flat) at the top to 56.125" (flat-flat) at the bottom. The structure is galvanized and does not have aviation lighting.

This tower is a 149 ft Monopole tower designed by PiROD Manufactures Inc. in October of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 38 mph with 0.75 inch ice thickness (in accordance with ASCE 7-05 Ice Conditions) 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
140.0	140.0	3	Alcatel Lucent	RRH2X60-AWS	1	1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Antel	BXA-80090/4CF			
		6	Commscope	HBXX-6517DS-A2M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			

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

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	150.0	2	EMS Wireless	RR65-19-00DP	6	1-5/8	
		1	EMS Wireless	RR90-17-02DP			
		3	Remec	G20045A1			
	149.0	1		Platform Mount [LP 403-1]			
140.0	140.0	1		Platform Mount [LP 304-1]	12	1-5/8	
		3	RFS Celwave	APX75-866514-CT0			
		6	RFS Celwave	FD9R6004/2C-3L			
		6	Antel	LPA-80090/4CF			1
		3	Rymsa Wireless	MG D5-800Tx			

Notes:
1) Existing equipment to be removed; not considered in this analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	150.0	1		13' Low Profile Platform	6	1-5/8
		6	EMS	RR90-17		
140.0	140.0	1		13' Low Profile Platform	12	1-5/8
		12	EMS	RR90-17		
130.0	130.0	1		13' Low Profile Platform	12	1-5/8
		12	EMS	RR90-17		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	PiROD File #: A-117712-, dated 10/17/2000	3523624	CCISITES
Foundation Drawings	PiROD File #: A-117712-, dated 10/17/2000	3879941	CCISITES
Geotechnical Report	JGI Project #: 00672G, dated 10/04/2000	3523623	CCISITES

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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	149.083 - 133.083	Pole	TP26x22.0663x0.25	1	-4.76	1032.65	11.0	Pass
L2	133.083 - 98.5	Pole	TP34.0625x24.7828x0.3125	2	-8.97	1691.39	35.5	Pass
L3	98.5 - 64.833	Pole	TP41.75x32.489x0.375	3	-15.05	2488.87	40.8	Pass
L4	64.833 - 32	Pole	TP49.0625x39.8474x0.375	4	-22.33	2929.03	47.7	Pass
L5	32 - 0	Pole	TP56.125x46.961x0.375	5	-32.11	3449.67	52.6	Pass
						Summary	ELC:	LC5
						Pole (L5)	52.6	Pass
						Rating =	52.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.9	Pass
1	Base Plate	0	Sufficient	Pass
1	Base Foundation	0	35.8	Pass
1	Base Foundation Soil Interaction	0	62.3	Pass

Structure Rating (max from all components) =	62.3%

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

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading and do not require modifications.

5) DISCLAIMER OF WARRANTIES

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

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

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

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

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

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

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

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

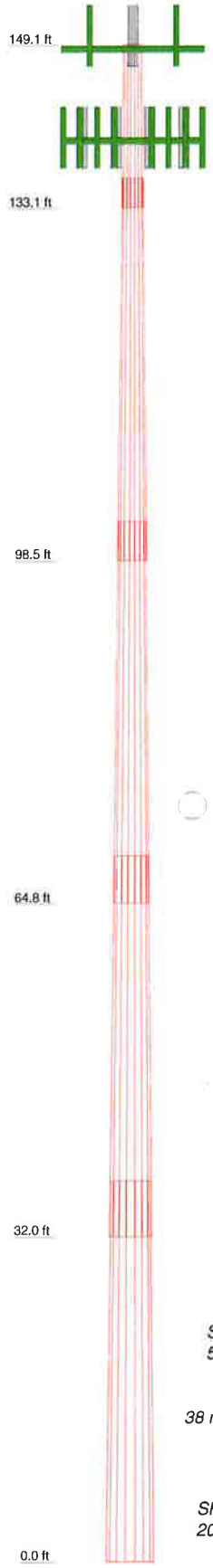
GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm,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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5
Length (ft)	16.00	37.50	37.50	37.50	37.50
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750	0.3750
Socket Length (ft)	2.92	3.83	4.67	5.50	
Top Dia (in)	22.0663	24.7828	32.4890	39.8474	46.9610
Bot Dia (in)	26.0000	34.0625	41.7500	49.0625	56.1250
Grade			A572-65		
Weight (K)	1.0	3.7	5.6	6.7	7.8

24.8



AXIAL
42 K

SHEAR
5 K

MOMENT
524 kip-ft

TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
32 K

SHEAR
20 K

MOMENT
2045 kip-ft

TORQUE 0 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 403-1]	149	BXA-80090/4CF w/ Mount Pipe	140
RR90-17-02DP w/ Mount Pipe	149	BXA-80090/4CF w/ Mount Pipe	140
RR65-19-00DP w/ Mount Pipe	149	(2) HBXX-6517DS-A2M w/ Mount Pipe	140
RR65-19-00DP w/ Mount Pipe	149	(2) HBXX-6517DS-A2M w/ Mount Pipe	140
G20045A1	149	(2) HBXX-6517DS-A2M w/ Mount Pipe	140
G20045A1	149	(2) FD9R6004/2C-3L	140
G20045A1	149	(2) FD9R6004/2C-3L	140
Pipe Mount 6'x2.375"	149	(2) FD9R6004/2C-3L	140
Pipe Mount 6'x2.375"	149	RRH2X60-AWS	140
Pipe Mount 6'x2.375"	149	RRH2X60-AWS	140
Platform Mount [LP 304-1]	140	RRH2X60-AWS	140
APX75-866514-CT0 w/ Mount Pipe	140	RRH2X60-PCS	140
APX75-866514-CT0 w/ Mount Pipe	140	RRH2X60-PCS	140
APX75-866514-CT0 w/ Mount Pipe	140	RRH2X60-PCS	140
BXA-80090/4CF w/ Mount Pipe	140	DB-T1-6Z-8AB-0Z	140

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

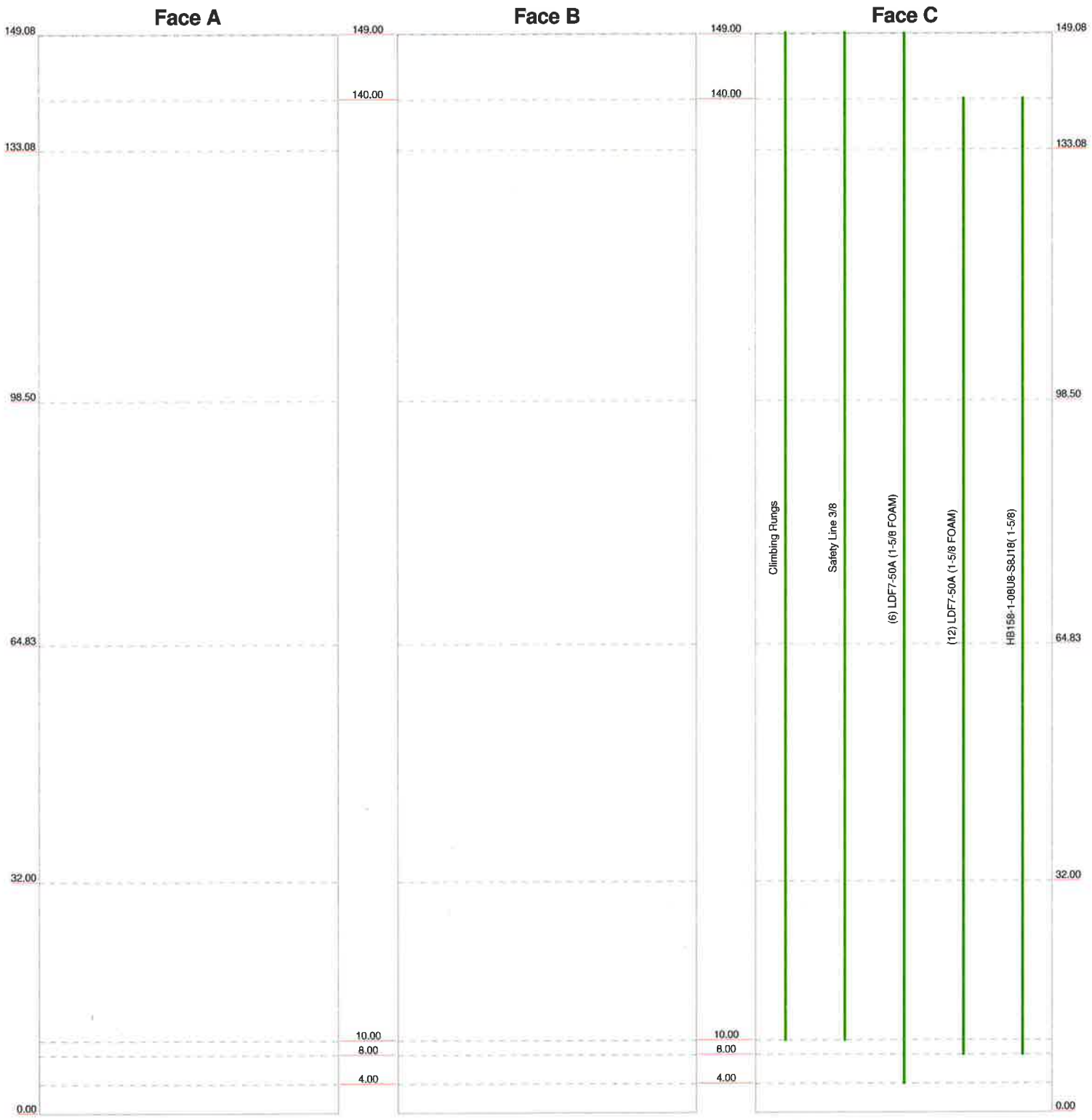
1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 52.6%

GPD
520 South Main Street, Ste 2531
Akron, OH
Phone: (330) 572-2100
FAX: (330) 572-2101
GPD

Job:	PLAINFIELD/I-395 - BU #: 826747
Project:	2015777.826747.01
Client: Crown Castle USA, Inc.	Drawn by: ESchnaus App'd:
Code: TIA/EIA-222-F	Date: 04/15/15 Scale: N
Path: \\AKRN05.gpdco.com\TELECOM\Crown\826747\01\tnx\826747.eri	Dwg No.

0' - 149'31/32"

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



GPD
520 South Main Street, Ste 2531
Akron, OH
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: PLAINFIELD/I-395 - BU #: 826747			
Project: 2015777.826747.01			
Client: Crown Castle USA, Inc.	Drawn by: ESchnaus	App'd:	
Code: TIA/EIA-222-F	Date: 04/15/15	Scale: N	
Path: \\AKRN05.gpdco.com\TELECOM\Crown\826747\01\tnx\826747.eri		Dwg No.	

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 Windham County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
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.

Options

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

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	149.08-133.08	16.00	2.92	18	22.0663	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	133.08-98.50	37.50	3.83	18	24.7828	34.0625	0.3125	1.2500	A572-65 (65 ksi)
L3	98.50-64.83	37.50	4.67	18	32.4890	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	64.83-32.00	37.50	5.50	18	39.8474	49.0625	0.3750	1.5000	A572-65 (65 ksi)
L5	32.00-0.00	37.50		18	46.9610	56.1250	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.4067	17.3112	1040.9447	7.7448	11.2097	92.8612	2083.2592	8.6573	3.4437	13.775
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.8981	24.2715	1836.1757	8.6870	12.5897	145.8477	3674.7676	12.1381	3.8118	12.198
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.4450	17.424
L3	33.9514	38.2237	4980.3360	11.4005	16.5044	301.7579	9967.2253	19.1155	5.0581	13.488
	42.3941	49.2466	10650.9822	14.6881	21.2090	502.1916	21315.9793	24.6280	6.6880	17.835
L4	41.6267	46.9821	9248.2053	14.0127	20.2425	456.8708	18508.5796	23.4955	6.3531	16.942
	49.8194	57.9503	17355.1378	17.2841	24.9238	696.3293	34733.1119	28.9807	7.9750	21.267
L5	49.0502	55.4489	15203.3994	16.5380	23.8562	637.2943	30426.8038	27.7297	7.6051	20.28
	56.9908	66.3564	26056.1506	19.7913	28.5115	913.8821	52146.5865	33.1845	9.2180	24.581

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 plf
Climbing Rungs	C	No	CaAa (Out Of Face)	149.08 - 10.00	1	No Ice	0.13	7.12
						1/2" Ice	0.23	8.24
						1" Ice	0.33	9.97
						2" Ice	0.53	15.26
						4" Ice	0.93	33.18
Safety Line 3/8	C	No	CaAa (Out Of Face)	149.08 - 10.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	149.00 - 4.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	140.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30

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
Platform Mount [LP 403-1]	C	None		0.0000	149.00	No Ice	18.85	18.85	1.50
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
						2" Ice	40.65	40.65	2.69

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	62.45	62.45	3.87
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.12 0.22 0.56
RR65-19-00DP w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.87 6.32 6.79 7.74 10.02	4.17 5.16 5.96 7.63 11.15	0.04 0.08 0.13 0.26 0.65
RR65-19-00DP w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.87 6.32 6.79 7.74 10.02	4.17 5.16 5.96 7.63 11.15	0.04 0.08 0.13 0.26 0.65
G20045A1	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.75 0.87 1.00 1.30 1.98	0.48 0.59 0.71 0.97 1.60	0.01 0.02 0.03 0.05 0.12
G20045A1	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.75 0.87 1.00 1.30 1.98	0.48 0.59 0.71 0.97 1.60	0.01 0.02 0.03 0.05 0.12
G20045A1	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.75 0.87 1.00 1.30 1.98	0.48 0.59 0.71 0.97 1.60	0.01 0.02 0.03 0.05 0.12
Pipe Mount 6'x2.375"	A	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.03 0.04 0.05 0.09 0.23
Pipe Mount 6'x2.375"	B	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.03 0.04 0.05 0.09 0.23
Pipe Mount 6'x2.375"	C	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.03 0.04 0.05 0.09 0.23
Platform Mount [LP 304-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.46 22.44 27.42 37.38 57.30	17.46 22.44 27.42 37.38 57.30	1.35 1.62 1.90 2.45 3.55
APX75-866514-CT0 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.04 10.78 11.50 12.92 15.88	6.61 7.94 9.12 11.14 15.40	0.06 0.13 0.21 0.40 0.94
APX75-866514-CT0 w/	B	From Leg	4.00	0.0000	140.00	No Ice	10.04	6.61	0.06

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
Mount Pipe			0.00			1/2" Ice	10.78	7.94	0.13
			0.00			1" Ice	11.50	9.12	0.21
						2" Ice	12.92	11.14	0.40
						4" Ice	15.88	15.40	0.94
APX75-866514-CT0 w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	10.04	6.61	0.06
			0.00			1/2" Ice	10.78	7.94	0.13
			0.00			1" Ice	11.50	9.12	0.21
						2" Ice	12.92	11.14	0.40
						4" Ice	15.88	15.40	0.94
BXA-80090/4CF w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	4.46	4.37	0.04
			0.00			1/2" Ice	5.14	5.40	0.08
			0.00			1" Ice	5.70	6.16	0.13
						2" Ice	6.86	7.78	0.25
						4" Ice	9.32	11.23	0.61
BXA-80090/4CF w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	4.46	4.37	0.04
			0.00			1/2" Ice	5.14	5.40	0.08
			0.00			1" Ice	5.70	6.16	0.13
						2" Ice	6.86	7.78	0.25
						4" Ice	9.32	11.23	0.61
BXA-80090/4CF w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	4.46	4.37	0.04
			0.00			1/2" Ice	5.14	5.40	0.08
			0.00			1" Ice	5.70	6.16	0.13
						2" Ice	6.86	7.78	0.25
						4" Ice	9.32	11.23	0.61
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00			1/2" Ice	9.65	8.18	0.14
			0.00			1" Ice	10.29	9.14	0.21
						2" Ice	11.59	11.02	0.40
						4" Ice	14.32	15.03	0.91
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00			1/2" Ice	9.65	8.18	0.14
			0.00			1" Ice	10.29	9.14	0.21
						2" Ice	11.59	11.02	0.40
						4" Ice	14.32	15.03	0.91
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00			1/2" Ice	9.65	8.18	0.14
			0.00			1" Ice	10.29	9.14	0.21
						2" Ice	11.59	11.02	0.40
						4" Ice	14.32	15.03	0.91
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
RRH2X60-AWS	A	From Leg	4.00	0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00			1/2" Ice	2.40	1.61	0.06
			0.00			1" Ice	2.61	1.80	0.08

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	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2X60-AWS	B	From Leg	4.00	0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00			1/2" Ice	2.40	1.61	0.06
			0.00			1" Ice	2.61	1.80	0.08
						2" Ice	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2X60-AWS	C	From Leg	4.00	0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00			1/2" Ice	2.40	1.61	0.06
			0.00			1" Ice	2.61	1.80	0.08
						2" Ice	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2X60-PCS	A	From Leg	4.00	0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			0.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	B	From Leg	4.00	0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			0.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	C	From Leg	4.00	0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			0.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	140.00	No Ice	5.60	2.33	0.04
			0.00			1/2" Ice	5.92	2.56	0.08
			0.00			1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149.083 - 133.083	17.910	33	1.0342	0.0007
L2	136 - 98.5	15.091	33	1.0166	0.0008
L3	102.333 - 64.833	8.587	33	0.7925	0.0003
L4	69.5 - 32	3.968	33	0.5362	0.0002
L5	37.5 - 0	1.171	33	0.2833	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	Platform Mount [LP 403-1]	33	17.892	1.0341	0.0007	40078
140.00	Platform Mount [LP 304-1]	33	15.945	1.0256	0.0008	22070

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149.083 - 133.083	51.688	8	2.9854	0.0021
L2	136 - 98.5	43.554	8	2.9348	0.0023
L3	102.333 - 64.833	24.786	8	2.2876	0.0010
L4	69.5 - 32	11.453	8	1.5478	0.0005
L5	37.5 - 0	3.380	8	0.8178	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	Platform Mount [LP 403-1]	8	51.636	2.9853	0.0021	13974
140.00	Platform Mount [LP 304-1]	8	46.018	2.9608	0.0023	7694

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	149.083 - 133.083 (1)	TP26x22.0663x0.25	16.00	0.00	0.0	39.000	19.8636	-4.76	774.68	0.006
L2	133.083 - 98.5 (2)	TP34.0625x24.7828x0.3125	37.50	0.00	0.0	39.000	32.5350	-8.97	1268.86	0.007
L3	98.5 - 64.833 (3)	TP41.75x32.489x0.375	37.50	0.00	0.0	39.000	47.8748	-15.05	1867.12	0.008
L4	64.833 - 32 (4)	TP49.0625x39.8474x0.375	37.50	0.00	0.0	39.000	56.3416	-22.33	2197.32	0.010
L5	32 - 0 (5)	TP56.125x46.961x0.375	37.50	0.00	0.0	39.000	66.3564	-32.11	2587.90	0.012

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	149.083 - 133.083 (1)	TP26x22.0663x0.25	55.98	5.486	39.000	0.141	0.00	0.000	39.000	0.000
L2	133.083 - 98.5 (2)	TP34.0625x24.7828x0.3125	398.04	18.168	39.000	0.466	0.00	0.000	39.000	0.000
L3	98.5 - 64.833 (3)	TP41.75x32.489x0.375	826.08	20.892	39.000	0.536	0.00	0.000	39.000	0.000
L4	64.833 - 32 (4)	TP49.0625x39.8474x0.375	1336.42	24.370	39.000	0.625	0.00	0.000	39.000	0.000
L5	32 - 0 (5)	TP56.125x46.961x0.375	2044.88	26.851	39.000	0.688	0.00	0.000	39.000	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	149.083 - 133.083 (1)	TP26x22.0663x0.25	8.82	0.444	26.000	0.034	0.02	0.001	26.000	0.000
L2	133.083 - 98.5 (2)	TP34.0625x24.7828x0.3125	11.57	0.356	26.000	0.027	0.06	0.001	26.000	0.000
L3	98.5 - 64.833 (3)	TP41.75x32.489x0.375	14.51	0.303	26.000	0.023	0.11	0.001	26.000	0.000
L4	64.833 - 32 (4)	TP49.0625x39.8474x0.375	17.33	0.308	26.000	0.024	0.16	0.001	26.000	0.000
L5	32 - 0 (5)	TP56.125x46.961x0.375	20.46	0.308	26.000	0.024	0.21	0.001	26.000	0.000

Pole Interaction Design Data

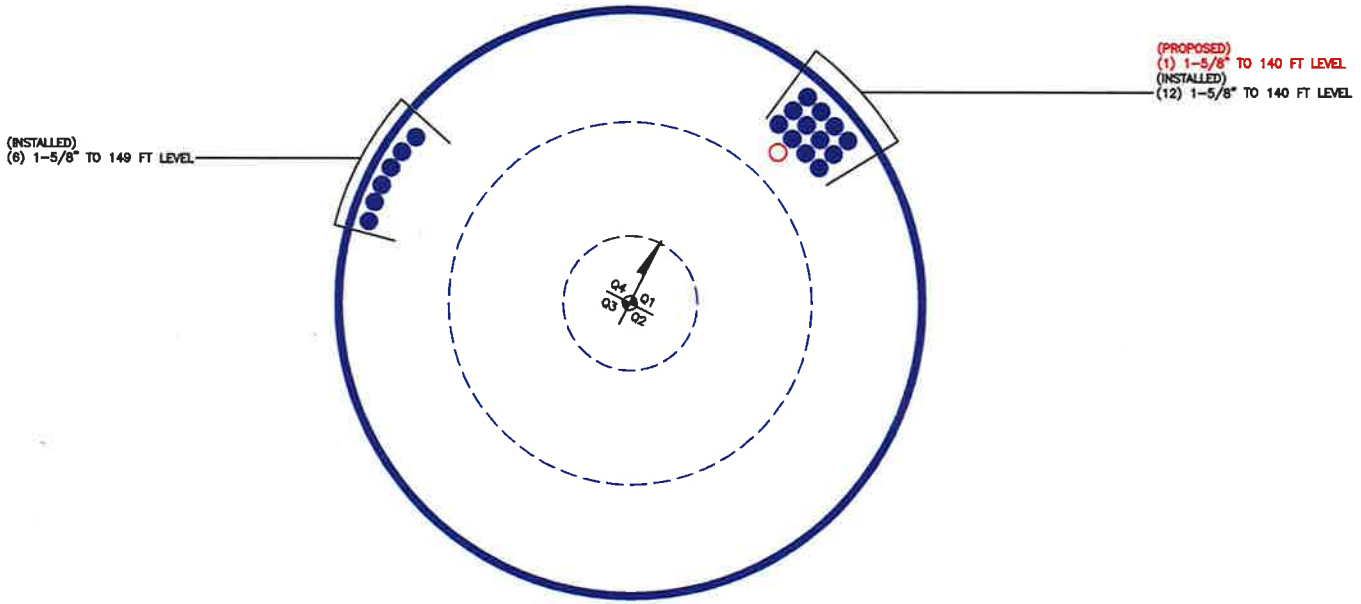
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{bv}}{F_{bv}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	149.083 - 133.083 (1)	0.006	0.141	0.000	0.034	0.000	0.147 ✔	1.333	H1-3+VT ✔
L2	133.083 - 98.5 (2)	0.007	0.466	0.000	0.027	0.000	0.473 ✔	1.333	H1-3+VT ✔
L3	98.5 - 64.833 (3)	0.008	0.536	0.000	0.023	0.000	0.544 ✔	1.333	H1-3+VT ✔
L4	64.833 - 32 (4)	0.010	0.625	0.000	0.024	0.000	0.635 ✔	1.333	H1-3+VT ✔
L5	32 - 0 (5)	0.012	0.688	0.000	0.024	0.000	0.701 ✔	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	149.083 - 133.083	Pole	TP26x22.0663x0.25	1	-4.76	1032.65	11.0	Pass
L2	133.083 - 98.5	Pole	TP34.0625x24.7828x0.3125	2	-8.97	1691.39	35.5	Pass
L3	98.5 - 64.833	Pole	TP41.75x32.489x0.375	3	-15.05	2488.87	40.8	Pass
L4	64.833 - 32	Pole	TP49.0625x39.8474x0.375	4	-22.33	2929.03	47.7	Pass
L5	32 - 0	Pole	TP56.125x46.961x0.375	5	-32.11	3449.67	52.6	Pass
						Summary	ELC:	LC5
						Pole (L5)	52.6	Pass
						Rating =	52.6	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 826747 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

25/03/13	NEW BUILD PER WORK ORDER # 800000	AMC
27/05/14	UPDATED PER WORK ORDER # 772334	TDG
12/3/2015	UPDATED PER WORK ORDER 1068816	AMT

DRAWN BY: CJR
CHECKED BY: KNL
DRAWING DATE: 25/3/2013

SITE NUMBER:
SITE NAME:

SITE NAME

PLAINFIELD/I-395

BUSINESS UNIT NUMBER

826747

SITE ADDRESS

1197 NORWICH ROAD
PLAINFIELD, CT 06234
WINDHAM COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING	1" = 1'-0"	1

PLOT DATE: 3/18/2015 FILE NAME: 826747_BASELEVEL.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *826747*
Site Name: *Plainfield/I-395*
App #: *244578 Rev. 4*

Pole Manufacturer:	*Pirod*

Reactions		
Moment:	2045	ft-kips
Axial:	32	kips
Shear:	20	kips

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	39	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi
Bolt Circle:	61	in

Anchor Rod Results

Maximum Rod Tension:	40.4 Kips	Rigid
Allowable Tension:	67.5 Kips	Service, ASD
Anchor Rod Stress Ratio:	59.9% **Pass**	Fty*ASIF

Plate Data		
Diam:	65	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.57	in

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 23.90

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

n/a

Stiffener Results N/A for Rohn / Pirod

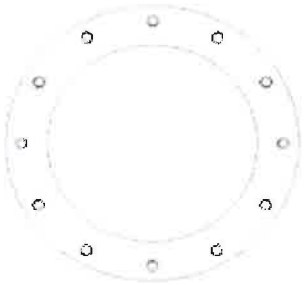
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Diam:	56.125	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	



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

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

GPD GROUP

Mat Foundation Analysis
Plainfield/I-395 - BU #: 826747
2015777.826747.01

General Info	
Code	TIA/EIA-222-F (LRFD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	Yes
Max Capacity	1.1

Tower Reactions		
Moment, M	2045	k-ft
Axial, P	32	k
Shear, V	20	k

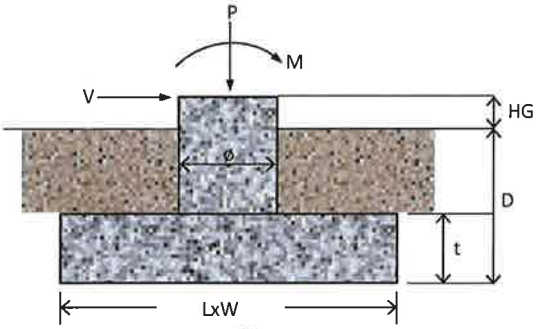
Pad & Pier Geometry		
Pier Diameter, ø	6.5	ft
Pad Length, L	21.5	ft
Pad Width, W	21.5	ft
Pad Thickness, t	2	ft
Depth, D	6	ft
Height Above Grade, HG	0.5	ft

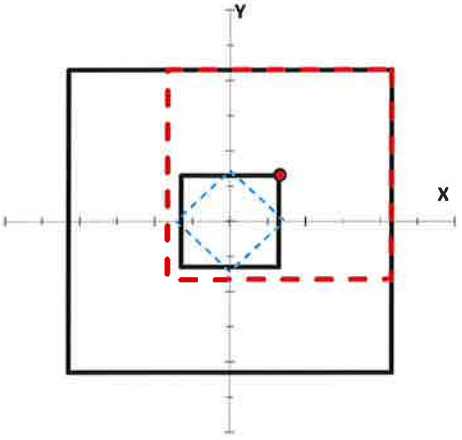
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 6	
Pad Quantity Per Layer	41	
Pier Rebar Size	# 8	
Pier Quantity of Rebar	31	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	120	pcf
Angle of Friction, ø	30	°
Bearing Type	Net	
Ultimate Bearing	5	ksf
Water Table Depth	8.5	ft
Frost Depth	3.33	ft

Bearing Summary			Load Case
Qxmax	2.06	ksf	0.9D+1.6W
Qymax	2.06	ksf	0.9D+1.6W
Qmax @ 45°	2.22	ksf	0.9D+1.6W
$Q_{(all)\ Gross}$	4.29	ksf	
Controlling Capacity	**51.7%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	1.61	≥1.0	0.9D+1.6W
FS(ot)y	1.61	≥1.0	0.9D+1.6W
Controlling Capacity	**62.3%**	**Pass**	





Base Foundation Reinforcement Check
Plainfield/I-395 - BU #: 826747
2015777.826747.01

Code: TIA/EIA-222-F

Tower Reactions	
Moment	2045 k-ft
Axial	32 k
Shear	20 k

Pad & Pier Geometry	
Height	6 ft
Height above Grade	0.5 ft
Pad Length, L	21.5 ft
Pad Width, W	21.5 ft
Pad Thickness	2 ft
Pier Shape	Round
Round Pier Diameter	6.5 ft

Pad & Pier Reinforcing	
Reinforcing Known	Yes
f_c'	4 ksi
Clear Cover	3 in
Rebar Fy	60 ksi
Reinforced Top & Bottom?	Yes
Pad Rebar Size	# 6
Pad Rebar Quantity	41
Pier Rebar Size	# 8
Pier Rebar Quantity	31

Unit Weights	
Concrete Unit Weight	150 pcf
Soil Unit Weight	120 pcf

Orthogonal Bearing	
Q_{max}	2.10 ksf
Q_{min}	0.00 ksf
Bearing Length	17.66 ft

Pad Moment Capacity		
M_u=	22.18 k-ft	
ϕM_n=	72.71 k-ft	
Moment Capacity	30.5%	**OK**
One-Way (Wide-Beam) Shear		
V_u=	92.79 kips	
ϕV_n=	486.46 kips	
Shear Capacity	19.1%	**OK**
Two-Way (Punching) Shear		
V_u=	480.19 kips	
ϕV_n=	1342.49 kips	
Shear Capacity	35.8%	**OK**
Pier Compression		
P_u=	41.60 kips	
ϕP_n=	9168.93 kips	
Compression Capacity	0.5%	**OK**

Overall Capacities		
Reinforcement Capacity	35.8%	**OK**
As Min Met?	Yes	
Controlling Capacity	**35.8%**	**OK**