STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 8, 2012

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-084-121002-** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 10 Bona Street, Milford, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 1, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

L Roberts

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable Benjamin G. Blake, Mayor, City of Milford
David Sulkis, City Planner, City of Milford
Crown Castle

CSC
CONNECTICUT SITING COUNCIL

ROBINSON & COLE LLP

EM-VER-084-121002

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

October 1, 2012

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
10 Bona Street, Milford, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 113-foot level on an existing 133-foot tower at the above-referenced address. The tower is owned by Crown Castle. Cellco's use of the tower was approved by the Council in 2002. Cellco now intends to replace six (6) of its existing antennas with three (3) model BXA-171063-8BF PCS antennas and three (3) model SWCP 2x5514 LTE antennas, all at the same 113-foot level. Cellco also intend to install six (6) coax cable diplexers behind its antennas. Attached behind Tab 1 are the specifications for the replacement antennas and cable diplexers.

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 Benjamin G. Blake, Mayor of the City of Milford. A copy of this letter is also being sent to 10 Bona Street LLC, the owner of the property on which the tower is located.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and diplexers will be located at the 113-foot level on the existing 133-foot tower.

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Tab 2.

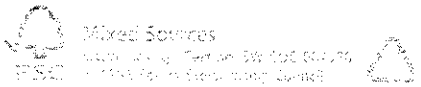
Also attached is a Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

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:
Benjamin G. Blake, Milford Mayor
10 Bona Street LLC
Sandy Carter


Mixed Sources

Amphenol ANTENNA SOLUTIONS

BXA-171063-8BF-EDIN-X

Replace "X" with desired electrical downtilt

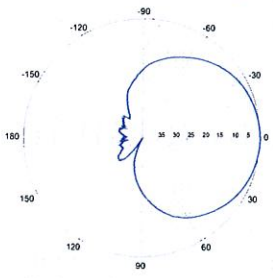
X-Pol | FET Panel | 63° | 17.4 dBi

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	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm	5.2 in
Weight without mounting brackets	4.8 kg	10.5 lbs
Survival wind speed	296 km/hr	184 mph
Wind area	Front: 0.19 m² Side: 0.14 m²	Front: 2.0 ft² Side: 1.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf

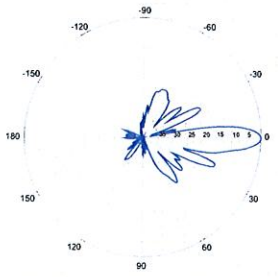
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

BXA-171063-8BF-EDIN-X



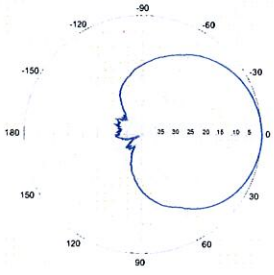
Horizontal | 1710-1880 MHz

BXA-171063-8BF-EDIN-0



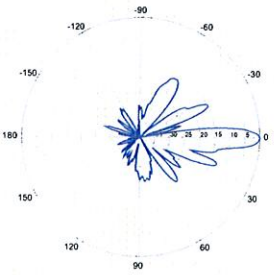
0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-X



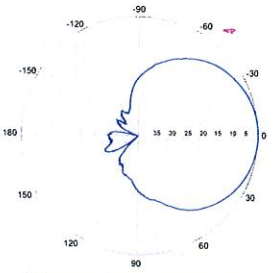
Horizontal | 1850-1990 MHz

BXA-171063-8BF-EDIN-0



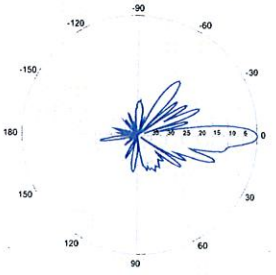
0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171063-8BF-EDIN-0

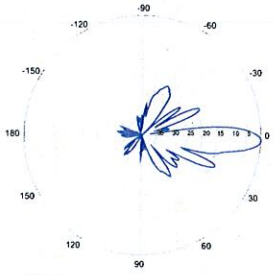


0° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-X

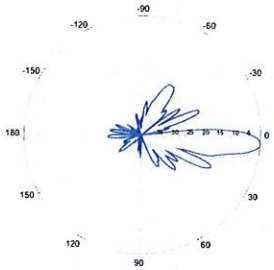
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8BF-EDIN-2



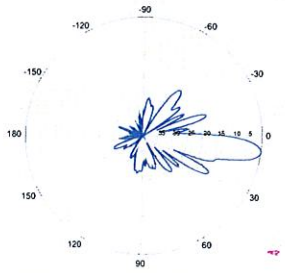
2° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-4



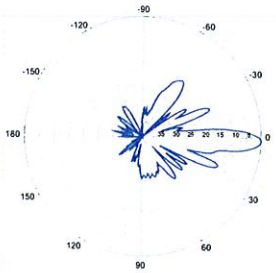
4° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-8



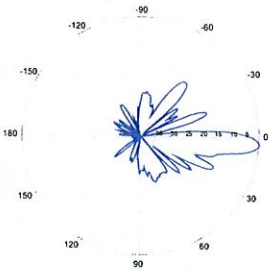
8° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-2



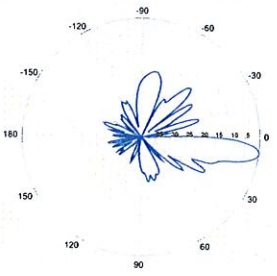
2° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-4



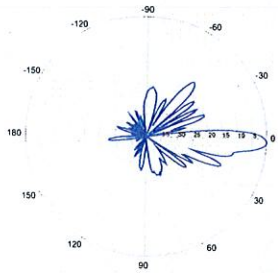
4° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-8



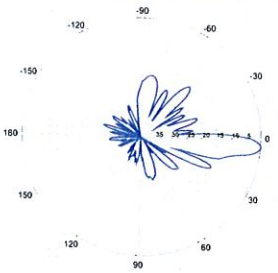
8° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-2



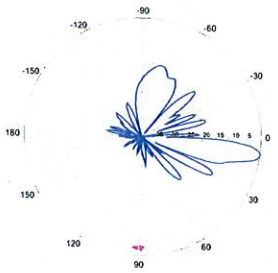
2° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-8

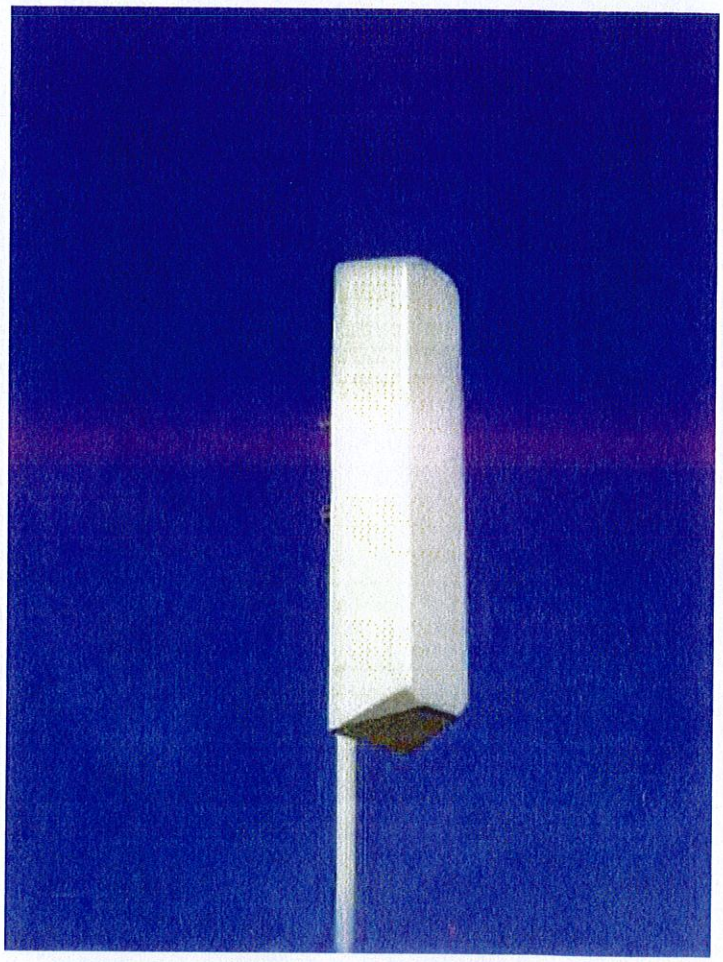


8° | Vertical | 1920-2170 MHz

Swedcom

SWCP 2x5514

698 - 896 MHz Dual (2x) CP log-periodic antenna



Features

- ❑ **Transmit Diversity Gain**
- ❑ **Can be configured to combine space & polarization diversity**
- ❑ **Outstanding performance over the entire band (698 - 896 MHz)**
- ❑ **Excellent Axial Ratio**
- ❑ **Optimized for 4G & 3G systems**
- ❑ **Low intermodulation**
- ❑ **Improved Side-to-side rejection**
- ❑ **Fading reduction**
- ❑ **Excellent isolation between ports**

Electrical specifications

Frequency range:	**698-896 MHz**	
Impedance:	**50 ohm**	
Connector type:	**7/16 Din**	
Return loss:	**18 dB**	
Polarization:	**Circular**	
Gain ea. port [Circular]:	**2x14 dBdC**	
Gain ea. port [Linear]:	**2x11 dBdL**	
Axial Ratio:	**2 dB**	
Isolation between ports (TX band):	**30 dB**	
Front-to-back ratio:	**30 dB**	
Intermodulation (2x20W):	**IM3**	**150 dB**
	IM5	**160 dB**
	IM7/9	**170 dB**
Power rating:	**2x 500 W**	
H-plane (-3 dB point):	**2x 55°**	
V-plane (-3 dB point):	**2x 16°**	
Lightning protection:	**DC grounded**	

Mechanical specifications

Overall height:	**51.9 in**	**[1318 mm]**
Width:	**13.9 in**	**[353 mm]**
Depth:	**11.3 in**	**[287 mm]**
Weight (excluding brackets):	**20 lbs**	**[9 Kg]**
Wind load measured up to:	**150 mph**	**[240 Km/h]**
Wind area (front of antenna):	**5.01 sq. ft.**	**[0.46 sq.m]**
Lateral thrust at 113 mph/ 180 Km/h (worst case):	**256 lbs**	**[1138 N]**

Materials

Radiating Elements:	**Aluminum**
Transformer (Power distribution)	**Ceramic PCB**
Chassis:	**Aluminum**
Radome:	**Grey Fiberglass/PVC**
Mounting bolts:	**Stainless steel**

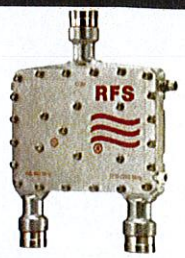
The SWCP 2x5514 is made in the U.S.A.

Product Data Sheet **FD9R6004/2C-3L**

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



Features/Benefits

- **LTE ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **Very compact & small size design – Easy installation and reduced tower load**
- **In-line long-neck connectors for easy connection & waterproofing**
- **Exceptional reliability & environmental protection (IP 67)**
- **Equipped with 1 * Breathable Vent – Prevent any humidity inside the product**
- **Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)**
- **Grounding already provided through the mounting bracket**
- **Kit available for easy dual mount**

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 57/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

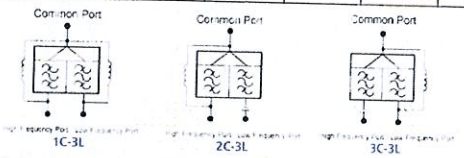
Notes

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

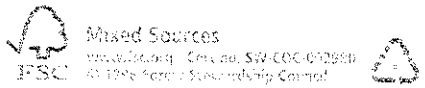
FD9R6004/2C-3L Installation Instructions: Wideband_Diplexer_Installation_Rev5.pdf

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X

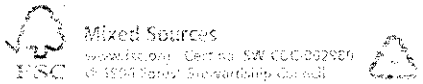


The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	


Mixed Sources
FSC

	General	Power	Density					
Site Name: Milford 3								
Tower Height: Verizon @ 113Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	1	500	136	0.0097	1900	1.0000	0.97%	
*AT&T UMTS	1	500	136	0.0097	880	0.5867	1.66%	
*AT&T GSM	6	427	136	0.0498	1900	1.0000	4.98%	
*AT&T GSM	9	296	136	0.0518	880	0.5867	8.83%	
*AT&T LTE	1	500	136	0.0097	740	0.4933	1.97%	
Verizon PCS	**11**	**260**	**113**	**0.0805**	**1970**	**1.0000**	**8.05%**	
Verizon Cellular	**9**	**263**	**113**	**0.0667**	**869**	**0.5793**	**11.51%**	
Verizon AWS	**1**	**631**	**113**	**0.0178**	**2145**	**1.0000**	**1.78%**	
Verizon 700	**1**	**860**	**113**	**0.0242**	**698**	**0.4653**	**5.20%**	
								44.95%
* Source: Siting Council								


Mixed Sources
FSC

Date: **July 30, 2012**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: Structural Analysis Report

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	
	Carrier Site Name:	Milford 3
Crown Castle Designation:	**Crown Castle BU Number:**	873633
	Crown Castle Site Name:	Milford
	Crown Castle JDE Job Number:	194062
	Crown Castle Work Order Number:	507107
	Crown Castle Application Number:	153719 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	507107
Site Data:	**10 Bona Street, MILFORD, New Haven County, CT** **Latitude *41° 13' 12.27"*, Longitude *-73° 4' 38.56"*** **133 Foot - Monopole Tower**	

Dear Veronica Harris,

Crown Castle 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 507107, in accordance with application 153719, revision 0.

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 local code requirements based upon a wind speed of 85 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 *Crown Castle* 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: Clinton Crouch, Engineer I / RJ

Respectfully submitted by:

Jamal A. Huwel, P.E.
Manager Engineering

STATE OF CONNECTICUT
JAMAL A. HUWEL
28903
LICENSED
PROFESSIONAL ENGINEER

7/30/2012

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1) INTRODUCTION

This tower is a 133 ft Monopole tower designed by SUMMIT in December of 2001. 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, 37.6 mph with 0.75 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
113.0	113.0	3	antel	BXA-171063-8BF-2 w/ Mount Pipe	-	-	-
		6	rfs celwave	FD9R6004/2C-3L			
		3	swedcom	SWCP 2x5514 w/ Mount Pipe			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
133.0	136.0	3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	12 2 1	1-5/8 7/8 1/4	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	ericsson	RRUS-11			
		12	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	133.0	1	tower mounts	Platform Mount [LP 601-1]			
113.0	113.0	6	antel	LPA-185080/8CFx2 w/ Mount Pipe	-	-	2
		6	antel	LPA-80090/4CF w/ Mount Pipe	12	1-5/8	1
		1	tower mounts	Platform Mount [LP 303-1]			

Notes:
1) Existing Equipment
2) Existing 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)
133	133	12	dapa	48000 PCS panel	-	-
123	123	12	dapa	48000 PCS panel	-	-
113	113	12	dapa	48000 PCS panel	-	-
103	103	12	dapa	48000 PCS panel	-	-
93	93	12	dapa	48000 PCS panel	-	-
83	83	12	dapa	48000 PCS panel	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Criscuolo Shepard Associates, PC	1340372	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF / Summit	1340388	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF / Summit	1339622	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built 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.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	133 - 86.5	Pole	TP33.116x24x0.25	1	-7.391	1321.408	40.9	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.783x0.281	2	-14.313	1878.450	60.8	Pass
L3	39.75 - 0	Pole	TP49.01x40.188x0.375	3	-24.497	3009.407	56.1	Pass
							Summary	
						Pole (L2)	60.8	Pass
						Rating =	60.8	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.9	Pass
1	Base Plate	0	49.3	Pass
1,2	Base Foundation (Pad & Pier)	0	52.1	Pass
1,2	Base Foundation (Drilled Pier)	0	42.7	Pass
Structure Rating (max from all components) =				**60.8%**

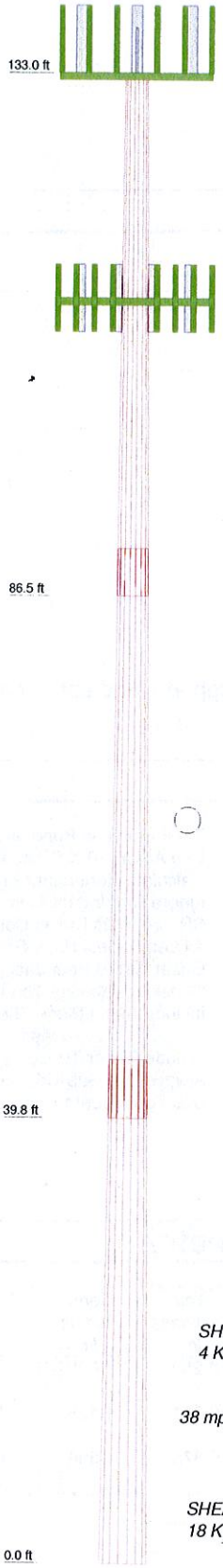
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) It is unknown whether the foundation is a drilled pier or pier and pad. Both designs were analyzed and determined to be sufficient.

4.1) Recommendations

The tower and foundation has sufficient capacity to carry the existing and proposed loads. No modifications are needed at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	1	2	3
Length (ft)	46.500	51.000	45.000
Number of Sides	18	18	18
Thickness (in)	0.250	0.281	0.375
Socket Length (ft)	4.250	5.250	
Top Dia (in)	24.000	31.783	40.188
Bot Dia (in)	33.116	41.780	49.010
Grade		A607-65	
Weight (K)	3.6	5.7	8.1

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 4'	133	(4) LGP21401	133
(2) RRUS-11	133	Platform Mount [LP 601-1]	133
AM-X-CD-14-65-00T-RET w/ Mount Pipe	133	(2) LPA-80090/4CF w/ Mount Pipe	113
		BXA-171063-8BF-2 w/ Mount Pipe	113
(2) 7770.00 w/ Mount Pipe	133	(2) FD9R6004/2C-3L	113
(4) LGP21401	133	SWCP 2x5514 w/ Mount Pipe	113
DC6-48-60-18-8F	133	(2) LPA-80090/4CF w/ Mount Pipe	113
(2) RRUS-11	133	BXA-171063-8BF-2 w/ Mount Pipe	113
AM-X-CD-14-65-00T-RET w/ Mount Pipe	133	(2) FD9R6004/2C-3L	113
		SWCP 2x5514 w/ Mount Pipe	113
(2) 7770.00 w/ Mount Pipe	133	(2) LPA-80090/4CF w/ Mount Pipe	113
(4) LGP21401	133	BXA-171063-8BF-2 w/ Mount Pipe	113
(2) RRUS-11	133	(2) FD9R6004/2C-3L	113
AM-X-CD-14-65-00T-RET w/ Mount Pipe	133	SWCP 2x5514 w/ Mount Pipe	113
(2) 7770.00 w/ Mount Pipe	133	Platform Mount [LP 303-1]	113

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven 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: 60.8%

CROWN CASTLE
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Job: **BU # 873633**			
Project:			
Client: Crown Castle	Drawn by: RJenabzadeh	App'd:	
Code: TIA/EIA-222-F	Date: 07/30/12	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\CCrouch\873633\873633.eri		Dwg No. E-1	

Tower Input Data

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

3) Tower is located in New Haven County, Connecticut.
4) Basic wind speed of 85 mph.
5) Nominal ice thickness of 0.750 in.
6) Ice thickness is considered to increase with height.
7) Ice density of 56 pcf.
8) A wind speed of 38 mph is used in combination with ice.
9) Temperature drop of 50 °F.
10) Deflections calculated using a wind speed of 50 mph.
11) A non-linear (P-delta) analysis was used.
12) Pressures are calculated at each section.
13) Stress ratio used in pole design is 1.333.
14) Local bending stresses due to climbing loads, feedline 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				

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	133.000-86.500	46.500	4.250	18	24.000	33.116	0.250	1.000	A607-65 (65 ksi)
L2	86.500-39.750	51.000	5.250	18	31.783	41.780	0.281	1.125	A607-65 (65 ksi)
L3	39.750-0.000	45.000		18	40.188	49.010	0.375	1.500	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.370	18.846	1342.998	8.431	12.192	110.154	2687.762	9.425	3.784	15.136
	33.627	26.079	3558.975	11.667	16.823	211.555	7122.633	13.042	5.388	21.554
L2	33.119	28.126	3526.213	11.183	16.146	218.400	7057.065	14.066	5.099	18.125

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
L3	42.425	37.052	8061.532	14.732	21.224	379.827	16133.672	18.529	6.858	24.38
	41.853	47.388	9489.852	14.134	20.416	464.832	18992.192	23.698	6.413	17.102
	49.766	57.888	17299.056	17.265	24.897	694.823	34620.874	28.949	7.966	21.242

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 133.000-86.500				1	1	1		
L2 86.500-39.750				1	1	1		
L3 39.750-0.000				1	1	1		

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
LCF158-50A(1-5/8")	A	No	Inside Pole	133.000 - 6.000	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
6-8AWG 3 PAIR(7/8")	A	No	Inside Pole	133.000 - 6.000	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
A-DQZNB2Yn1750 N(1/4")	A	No	Inside Pole	133.000 - 6.000	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
3" Conduit	A	No	Inside Pole	133.000 - 6.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
						2" Ice	0.000	0.003
						4" Ice	0.000	0.003
***								
561(1-5/8")	C	No	Inside Pole	113.000 - 6.000	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

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	133.000-86.500	A	0.000	0.000	0.000	0.000	0.641
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.429
L2	86.500-39.750	A	0.000	0.000	0.000	0.000	0.644
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.757
L3	39.750-0.000	A	0.000	0.000	0.000	0.000	0.465
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.547

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	133.000-86.500	A	0.865	0.000	0.000	0.000	0.000	0.641
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.429
L2	86.500-39.750	A	0.810	0.000	0.000	0.000	0.000	0.644
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.757
L3	39.750-0.000	A	0.750	0.000	0.000	0.000	0.000	0.465
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.547

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	133.000-86.500	0.000	0.000	0.000	0.000
L2	86.500-39.750	0.000	0.000	0.000	0.000
L3	39.750-0.000	0.000	0.000	0.000	0.000

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
Lighting Rod 5/8" x 4'	A	From Leg	0.000	2.000	0.000	133.000	No Ice	0.250	0.250	0.031
			0.000				1/2" Ice	0.664	0.664	0.034
							1" Ice	0.973	0.973	0.039
							2" Ice	1.494	1.494	0.059
							4" Ice	2.683	2.683	0.137
***										
(2) RRUS-11	A	From Leg	4.000	3.000	0.000	133.000	No Ice	4.424	1.186	0.055
			0.000				1/2" Ice	4.708	1.351	0.081
							1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
							4" Ice	6.940	2.753	0.368
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	3.000	0.000	133.000	No Ice	5.744	4.015	0.035
			0.000				1/2" Ice	6.198	4.633	0.078
							1" Ice	6.661	5.276	0.130
							2" Ice	7.618	6.678	0.254
							4" Ice	9.668	9.744	0.610
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	3.000	0.000	133.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.101
							1" Ice	7.128	5.711	0.155
							2" Ice	8.164	7.155	0.287
							4" Ice	10.360	10.412	0.665
(4) LGP21401	A	From Leg	4.000		0.000	133.000	No Ice	1.288	0.233	0.014
			0.000				1/2" Ice	1.445	0.313	0.021

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			3.000			Ice	1.611	0.403	0.030
						1" Ice	1.969	0.608	0.055
						2" Ice	2.788	1.121	0.135
						4" Ice			
DC6-48-60-18-8F	A	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	1.266	1.266	0.020
						1/2"	1.456	1.456	0.035
						Ice	1.658	1.658	0.053
						1" Ice	2.093	2.093	0.095
						2" Ice	3.098	3.098	0.215
						4" Ice			
(2) RRUS-11	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	4.424	1.186	0.055
						1/2"	4.708	1.351	0.081
						Ice	5.001	1.526	0.110
						1" Ice	5.613	1.900	0.179
						2" Ice	6.940	2.753	0.368
						4" Ice			
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	5.744	4.015	0.035
						1/2"	6.198	4.633	0.078
						Ice	6.661	5.276	0.130
						1" Ice	7.618	6.678	0.254
						2" Ice	9.668	9.744	0.610
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	6.119	4.254	0.055
						1/2"	6.626	5.014	0.101
						Ice	7.128	5.711	0.155
						1" Ice	8.164	7.155	0.287
						2" Ice	10.360	10.412	0.665
						4" Ice			
(4) LGP21401	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	1.288	0.233	0.014
						1/2"	1.445	0.313	0.021
						Ice	1.611	0.403	0.030
						1" Ice	1.969	0.608	0.055
						2" Ice	2.788	1.121	0.135
						4" Ice			
(2) RRUS-11	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	4.424	1.186	0.055
						1/2"	4.708	1.351	0.081
						Ice	5.001	1.526	0.110
						1" Ice	5.613	1.900	0.179
						2" Ice	6.940	2.753	0.368
						4" Ice			
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	5.744	4.015	0.035
						1/2"	6.198	4.633	0.078
						Ice	6.661	5.276	0.130
						1" Ice	7.618	6.678	0.254
						2" Ice	9.668	9.744	0.610
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	6.119	4.254	0.055
						1/2"	6.626	5.014	0.101
						Ice	7.128	5.711	0.155
						1" Ice	8.164	7.155	0.287
						2" Ice	10.360	10.412	0.665
						4" Ice			
(4) LGP21401	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice	1.288	0.233	0.014
						1/2"	1.445	0.313	0.021
						Ice	1.611	0.403	0.030
						1" Ice	1.969	0.608	0.055
						2" Ice	2.788	1.121	0.135
						4" Ice			
Platform Mount [LP 601-1]	C	None		0.000	133.000	No Ice	28.470	28.470	1.122
						1/2"	33.590	33.590	1.514
						Ice	38.710	38.710	1.905
						1" Ice	48.950	48.950	2.689
						2" Ice	69.430	69.430	4.255
						4" Ice			

***

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPA-80090/4CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.856 3.220 3.592 4.450 6.318	5.484 6.153 6.841 8.270 11.398	0.029 0.067 0.113 0.224 0.552
BXA-171063-8BF-2 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.059 0.098 0.193 0.487
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 0.000	0.000	113.000	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
SWCP 2x5514 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.251 7.751 8.252 9.286 11.480	6.966 7.746 8.499 10.058 13.400	0.039 0.101 0.173 0.339 0.790
(2) LPA-80090/4CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.856 3.220 3.592 4.450 6.318	5.484 6.153 6.841 8.270 11.398	0.029 0.067 0.113 0.224 0.552
BXA-171063-8BF-2 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.059 0.098 0.193 0.487
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 0.000	0.000	113.000	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
SWCP 2x5514 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.251 7.751 8.252 9.286 11.480	6.966 7.746 8.499 10.058 13.400	0.039 0.101 0.173 0.339 0.790
(2) LPA-80090/4CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.856 3.220 3.592 4.450 6.318	5.484 6.153 6.841 8.270 11.398	0.029 0.067 0.113 0.224 0.552
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.059 0.098 0.193 0.487
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 0.000	0.000	113.000	No Ice 1/2" Ice 1" Ice 2" 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
SWCP 2x5514 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	113.000	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.251 7.751 8.252 9.286 11.480	6.966 7.746 8.499 10.058 13.400	0.039 0.101 0.173 0.339 0.790
Platform Mount [LP 303-1]	C	None		0.000	113.000	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.660 18.870 23.080 31.500 48.340	14.660 18.870 23.080 31.500 48.340	1.250 1.481 1.713 2.175 3.101

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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	133 - 86.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-12.586	0.000	0.281
			Max. Mx	5	-7.391	-351.066	0.127
			Max. My	2	-7.391	0.000	351.199
			Max. Vy	5	11.158	-351.066	0.127
			Max. Vx	2	-11.158	0.000	351.199
			Max. Torque	11			-0.315
L2	86.5 - 39.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-21.175	0.000	0.281
			Max. Mx	5	-14.313	-939.525	0.135
			Max. My	2	-14.313	0.000	939.661
			Max. Vy	5	14.535	-939.525	0.135
			Max. Vx	2	-14.535	0.000	939.661
			Max. Torque	11			-0.315
L3	39.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33.169	0.000	0.281
			Max. Mx	11	-24.497	1664.387	0.136
			Max. My	2	-24.497	0.000	1664.524
			Max. Vy	5	17.682	-1664.387	0.136
			Max. Vx	2	-17.682	0.000	1664.524
			Max. Torque	11			-0.315

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	33.169	0.000	3.942
	Max. H_x	11	24.506	17.669	0.000
	Max. H_z	2	24.506	0.000	17.669
	Max. M_x	2	1664.524	0.000	17.669
	Max. M_z	5	1664.387	-17.669	0.000
	Max. Torsion	5	0.314	-17.669	0.000
	Min. Vert	1	24.506	0.000	0.000
	Min. H_x	5	24.506	-17.669	0.000
	Min. H_z	8	24.506	0.000	-17.669
	Min. M_x	8	-1664.251	0.000	-17.669
	Min. M_z	11	-1664.387	17.669	0.000
	Min. Torsion	11	-0.314	17.669	0.000

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	24.506	0.000	0.000	-0.131	0.000	0.000
Dead+Wind 0 deg - No Ice	24.506	0.000	-17.669	-1664.524	0.000	0.000
Dead+Wind 30 deg - No Ice	24.506	8.835	-15.302	-1441.539	-832.194	-0.157
Dead+Wind 60 deg - No Ice	24.506	15.302	-8.835	-832.330	-1441.403	-0.272
Dead+Wind 90 deg - No Ice	24.506	17.669	0.000	-0.136	-1664.387	-0.314
Dead+Wind 120 deg - No Ice	24.506	15.302	8.835	832.058	-1441.402	-0.272
Dead+Wind 150 deg - No Ice	24.506	8.835	15.302	1441.266	-832.194	-0.157
Dead+Wind 180 deg - No Ice	24.506	0.000	17.669	1664.251	0.000	0.000
Dead+Wind 210 deg - No Ice	24.506	-8.835	15.302	1441.266	832.194	0.157
Dead+Wind 240 deg - No Ice	24.506	-15.302	8.835	832.058	1441.402	0.272
Dead+Wind 270 deg - No Ice	24.506	-17.669	0.000	-0.136	1664.387	0.314
Dead+Wind 300 deg - No Ice	24.506	-15.302	-8.835	-832.330	1441.403	0.272
Dead+Wind 330 deg - No Ice	24.506	-8.835	-15.302	-1441.539	832.194	0.157

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Ice+Temp	33.169	0.000	0.000	-0.281	0.000	0.000
Dead+Wind 0 deg+Ice+Temp	33.169	0.000	-3.942	-388.385	0.000	0.000
Dead+Wind 30 deg+Ice+Temp	33.169	1.971	-3.414	-336.392	-194.042	-0.043
Dead+Wind 60 deg+Ice+Temp	33.169	3.414	-1.971	-194.343	-336.091	-0.074
Dead+Wind 90 deg+Ice+Temp	33.169	3.942	-0.000	-0.301	-388.084	-0.086
Dead+Wind 120 deg+Ice+Temp	33.169	3.414	1.971	193.741	-336.091	-0.074
Dead+Wind 150 deg+Ice+Temp	33.169	1.971	3.414	335.790	-194.042	-0.043
Dead+Wind 180 deg+Ice+Temp	33.169	0.000	3.942	387.783	0.000	0.000
Dead+Wind 210 deg+Ice+Temp	33.169	-1.971	3.414	335.790	194.042	0.043
Dead+Wind 240 deg+Ice+Temp	33.169	-3.414	1.971	193.741	336.091	0.074
Dead+Wind 270 deg+Ice+Temp	33.169	-3.942	-0.000	-0.301	388.084	0.086
Dead+Wind 300 deg+Ice+Temp	33.169	-3.414	-1.971	-194.343	336.091	0.074
Dead+Wind 330 deg+Ice+Temp	33.169	-1.971	-3.414	-336.392	194.042	0.043
Dead+Wind 0 deg - Service	24.506	0.000	-6.114	-576.328	0.000	0.000
Dead+Wind 30 deg - Service	24.506	3.057	-5.295	-499.133	-288.096	-0.055
Dead+Wind 60 deg - Service	24.506	5.295	-3.057	-288.232	-498.996	-0.095
Dead+Wind 90 deg - Service	24.506	6.114	0.000	-0.137	-576.191	-0.109
Dead+Wind 120 deg - Service	24.506	5.295	3.057	287.959	-498.996	-0.095
Dead+Wind 150 deg - Service	24.506	3.057	5.295	498.860	-288.096	-0.055
Dead+Wind 180 deg - Service	24.506	0.000	6.114	576.055	0.000	0.000
Dead+Wind 210 deg - Service	24.506	-3.057	5.295	498.860	288.096	0.055
Dead+Wind 240 deg - Service	24.506	-5.295	3.057	287.959	498.996	0.095
Dead+Wind 270 deg - Service	24.506	-6.114	0.000	-0.137	576.191	0.109
Dead+Wind 300 deg - Service	24.506	-5.295	-3.057	-288.232	498.996	0.095
Dead+Wind 330 deg - Service	24.506	-3.057	-5.295	-499.133	288.096	0.055

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-24.506	0.000	0.000	24.506	0.000	0.000%
2	0.000	-24.506	-17.669	0.000	24.506	17.669	0.000%
3	8.835	-24.506	-15.302	-8.835	24.506	15.302	0.000%
4	15.302	-24.506	-8.835	-15.302	24.506	8.835	0.000%
5	17.669	-24.506	0.000	-17.669	24.506	0.000	0.000%
6	15.302	-24.506	8.835	-15.302	24.506	-8.835	0.000%
7	8.835	-24.506	15.302	-8.835	24.506	-15.302	0.000%
8	0.000	-24.506	17.669	0.000	24.506	-17.669	0.000%
9	-8.835	-24.506	15.302	8.835	24.506	-15.302	0.000%
10	-15.302	-24.506	8.835	15.302	24.506	-8.835	0.000%
11	-17.669	-24.506	0.000	17.669	24.506	0.000	0.000%
12	-15.302	-24.506	-8.835	15.302	24.506	8.835	0.000%
13	-8.835	-24.506	-15.302	8.835	24.506	15.302	0.000%
14	0.000	-33.169	0.000	0.000	33.169	0.000	0.000%
15	0.000	-33.169	-3.942	0.000	33.169	3.942	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
16	1.971	-33.169	-3.414	-1.971	33.169	3.414	0.000%
17	3.414	-33.169	-1.971	-3.414	33.169	1.971	0.000%
18	3.942	-33.169	0.000	-3.942	33.169	0.000	0.000%
19	3.414	-33.169	1.971	-3.414	33.169	-1.971	0.000%
20	1.971	-33.169	3.414	-1.971	33.169	-3.414	0.000%
21	0.000	-33.169	3.942	0.000	33.169	-3.942	0.000%
22	-1.971	-33.169	3.414	1.971	33.169	-3.414	0.000%
23	-3.414	-33.169	1.971	3.414	33.169	-1.971	0.000%
24	-3.942	-33.169	0.000	3.942	33.169	0.000	0.000%
25	-3.414	-33.169	-1.971	3.414	33.169	1.971	0.000%
26	-1.971	-33.169	-3.414	1.971	33.169	3.414	0.000%
27	0.000	-24.506	-6.114	0.000	24.506	6.114	0.000%
28	3.057	-24.506	-5.295	-3.057	24.506	5.295	0.000%
29	5.295	-24.506	-3.057	-5.295	24.506	3.057	0.000%
30	6.114	-24.506	0.000	-6.114	24.506	0.000	0.000%
31	5.295	-24.506	3.057	-5.295	24.506	-3.057	0.000%
32	3.057	-24.506	5.295	-3.057	24.506	-5.295	0.000%
33	0.000	-24.506	6.114	0.000	24.506	-6.114	0.000%
34	-3.057	-24.506	5.295	3.057	24.506	-5.295	0.000%
35	-5.295	-24.506	3.057	5.295	24.506	-3.057	0.000%
36	-6.114	-24.506	0.000	6.114	24.506	0.000	0.000%
37	-5.295	-24.506	-3.057	5.295	24.506	3.057	0.000%
38	-3.057	-24.506	-5.295	3.057	24.506	5.295	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002084
3	Yes	5	0.00000001	0.00004940
4	Yes	5	0.00000001	0.00005056
5	Yes	4	0.00000001	0.00006301
6	Yes	5	0.00000001	0.00004906
7	Yes	5	0.00000001	0.00005020
8	Yes	4	0.00000001	0.00002083
9	Yes	5	0.00000001	0.00005020
10	Yes	5	0.00000001	0.00004906
11	Yes	4	0.00000001	0.00006301
12	Yes	5	0.00000001	0.00005056
13	Yes	5	0.00000001	0.00004940
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00050008
16	Yes	4	0.00000001	0.00054595
17	Yes	4	0.00000001	0.00054658
18	Yes	4	0.00000001	0.00049934
19	Yes	4	0.00000001	0.00054424
20	Yes	4	0.00000001	0.00054478
21	Yes	4	0.00000001	0.00049841
22	Yes	4	0.00000001	0.00054478
23	Yes	4	0.00000001	0.00054424
24	Yes	4	0.00000001	0.00049934
25	Yes	4	0.00000001	0.00054658
26	Yes	4	0.00000001	0.00054595
27	Yes	4	0.00000001	0.00000929
28	Yes	4	0.00000001	0.00011402
29	Yes	4	0.00000001	0.00012052
30	Yes	4	0.00000001	0.00001353
31	Yes	4	0.00000001	0.00011219
32	Yes	4	0.00000001	0.00011838
33	Yes	4	0.00000001	0.00000928
34	Yes	4	0.00000001	0.00011838
35	Yes	4	0.00000001	0.00011219
36	Yes	4	0.00000001	0.00001353
37	Yes	4	0.00000001	0.00012052

38	Yes	4	0.00000001	0.00011402

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	18.194	27	1.178	0.001
L2	90.75 - 39.75	8.605	27	0.921	0.000
L3	45 - 0	2.033	27	0.414	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.000	Lighting Rod 5/8" x 4'	27	18.194	1.178	0.001	47568
113.000	(2) LPA-80090/4CF w/ Mount Pipe	27	13.422	1.078	0.001	11891

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 86.5	52.502	2	3.398	0.004
L2	90.75 - 39.75	24.842	2	2.658	0.001
L3	45 - 0	5.871	2	1.194	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
133.000	Lighting Rod 5/8" x 4'	2	52.502	3.398	0.004	16590
113.000	(2) LPA-80090/4CF w/ Mount Pipe	2	38.737	3.111	0.002	4146

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	133 - 86.5 (1)	TP33.116x24x0.25	46.500	0.000	0.0	39.0000	25.418	-7.391	991.304	0.007
L2	86.5 - 39.75 (2)	TP41.78x31.783x0.281	51.000	0.000	0.0	39.0000	36.133	-14.313	1409.190	0.010
L3	39.75 - 0 (3)	TP49.01x40.188x0.375	45.000	0.000	0.0	39.0000	57.888	-24.497	2257.620	0.011

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 $\frac{P}{P_a}$

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	133 - 86.5 (1)	TP33.116x24x0.25	351.199	20.974 9	39.000 0	0.538	0.000	0.0000	39.000 0	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.783x0.281	939.658	31.221 4	39.000 0	0.801	0.000	0.0000	39.000 0	0.000
L3	39.75 - 0 (3)	TP49.01x40.188x0.375	1664.525	28.747 3	39.000 0	0.737	0.000	0.0000	39.000 0	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	133 - 86.5 (1)	TP33.116x24x0.25	11.158	0.4390	26.000 0	0.034	0.000	0.0000	26.000 0	0.000
L2	86.5 - 39.75 (2)	TP41.78x31.783x0.281	14.535	0.4023	26.000 0	0.031	0.000	0.0000	26.000 0	0.000
L3	39.75 - 0 (3)	TP49.01x40.188x0.375	17.682	0.3055	26.000 0	0.023	0.000	0.0000	26.000 0	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	133 - 86.5 (1)	0.007	0.538	0.000	0.034	0.000	0.546 ✔	1.333	H1-3+VT ✔
L2	86.5 - 39.75 (2)	0.010	0.801	0.000	0.031	0.000	0.811 ✔	1.333	H1-3+VT ✔
L3	39.75 - 0 (3)	0.011	0.737	0.000	0.023	0.000	0.748 ✔	1.333	H1-3+VT ✔

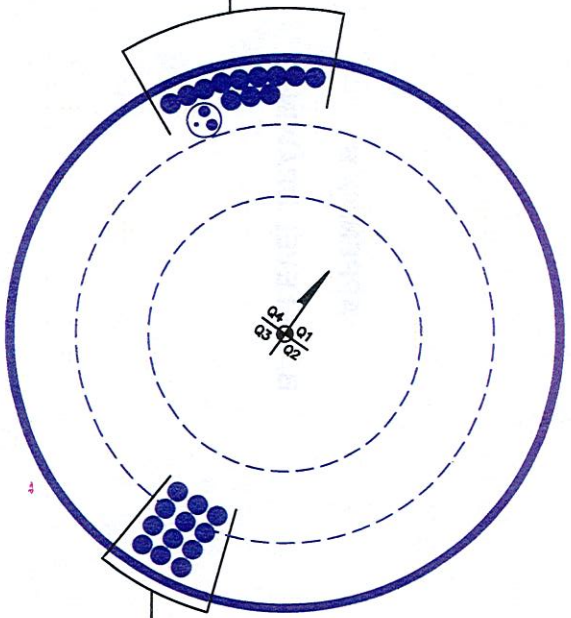
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	133 - 86.5	Pole	TP33.116x24x0.25	1	-7.391	1321.408	40.9	Pass
L2	86.5 - 39.75	Pole	TP41.78x31.783x0.281	2	-14.313	1878.450	60.8	Pass
L3	39.75 - 0	Pole	TP49.01x40.188x0.375	3	-24.497	3009.407	56.1	Pass
							Summary	
						Pole (L2)	60.8	Pass
						RATING =	**60.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

(INSTALLED)
(1) 1/4" TO 133 FT LEVEL-BUNDLED IN 3" CONDUIT
(2) 7/8" TO 133 FT LEVEL-BUNDLED IN 3" CONDUIT
(INSTALLED)
(12) 1-5/8" TO 133 FT LEVEL



(INSTALLED)
(12) 1-5/8" TO 113 FT LEVEL

BUSINESS UNIT: 873633 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *873633*
Site Name: *Milford*
App #: *153719*

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	24	
As Total=	37.44	in^2
A s/ Aconc, Rho:	0.0068	0.68%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.68%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8466.87	kips
at Mu=(ϕ=0.65)Mn=	5122.02	ft-kips
Max Tu, (φ=0.9) Tn =	2021.76	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	1896.719	ft-kips (* **Note**)
Max. Service Shaft P:	25	kips
Max Axial Force Type:	Comp.	

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

Load Factor	**Shaft Factored Loads**		
1.30	Mu:	2465.735	ft-kips
1.30	Pu:	32.5	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

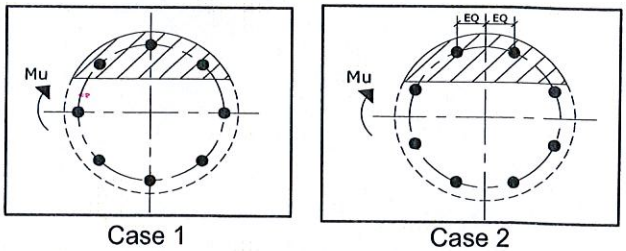
Seismic Properties

Seismic Design Category = B
Seismic Risk = **Low**

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **14.73** in
Extreme Steel Strain, εt: **0.0130**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	32.50	kips
Drilled Shaft Moment Capacity, φMn:	**5768.31**	ft-kips
Drilled Shaft Superimposed Mu:	**2465.74**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**42.7%**

Monopole Pier and Pad Foundation

BU # : 873633
Site Name: Milford
App. Number: 153719

TIA-222 Revision: F

Design Reactions		
Shear, **S**:	18	kips
Moment, **M**:	1665	ft-kips
Tower Height, **H**:	133	ft
Tower Weight, **Wt**:	25	kips
Base Diameter, **BD**:	4.08	ft

Foundation Dimensions		
Depth, **D**:	7	ft
Pad Width, **W**:	23.5	ft
Neglected Depth, **N**:	7	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	7.00	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.120	kcf
Ult. Bearing Capacity, Bc:	5.0	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	kcf
Base Friction, **μ**:	0.45	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	11	
Pier Rebar Quanity, **mp**:	32	18
Pad Rebar Size, **Spad**:	11	
Pad Rebar Quanity, **mpad**:	24	9
Pier Tie Size, **St**:	4	4
Tie Quanity, **mt**:	12	5

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7	5.5841667	**OK**
Overturning (ft-kips)	3247.76	1665.00	**51.3%**
Shear Capacity (kips)	135.36	18.00	**13.3%**
Bearing (ksf)	3.75	1.95	**52.1%**
Pad Shear - 1-way (kips)	997.64	390.52	**39.1%**
Pad Shear - 2-way (kips)	2585.04	709.87	**27.5%**
Pad Moment Capacity (k-ft)	5177.90	1795.27	**34.7%**
Pier Moment Capacity (k-ft)	5864.37	1746.00	**29.8%**

☐ Modifications

Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: 873633
Site Name: *Milford*
App Number: *153719*

CROWN CASTLE

ACI 318 Version: 2002

Design Reactions		
Shear, **S**:	18.00	kips
Moment, **Mt**:	1665.00	ft-kips
Tower Weight, **Wt**:	25.00	kips
Tower Height, **H**:	133	ft
Base Diameter, **BD**:	49.0	in

Foundation Dimensions		
Caisson Diameter, **CD**:	7.0	ft
Ext. Above Grade, **E**:	0.5	ft
Depth Below Grade, **L**:	25.0	ft
Neglected Depth, **N**:	3.5	ft
Rebar Size, **Sp**:	11	
Rebar Quantity, **mp**:	24	
Tie Size, **tp**:	5	

Material Properties		
Rebar Tensile, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	150	pcf
Clear Cover, **cc**:	4	in

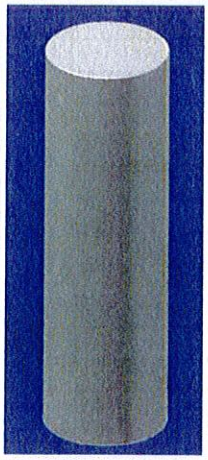
Soil Properties		
Soil Unit Weight, γ:	120	pcf
Allowable Bearing, **Bc**:	5.000	ksf
Seismic Design Cat, **z**:	B	

Caisson Analysis		
Depth to Zero Shear:	6.4	ft
Max Factored Moment:	2465.74	ft-kips
Overturning FOS:	5.1	

Depth		Shear		Moment	
2.55	ft	18.1	kips	1831.9	ft-kips
5.1	ft	11.5	kips	1874.6	ft-kips
7.65	ft	-10.7	kips	1877.7	ft-kips

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Minimum Req'd Dia. 1 (ft):	7.00	2.52	OK
Minimum Req'd Dia. 2 (ft):	7.00	5.58	OK
Bearing (ksf):	5.00	0.65	OK
Rebar Area (in²):	37.44	18.47	OK
Pier moment capacity (k-ft):	5768.31	2465.74	OK
Rebar spacing (in):	8.54	2 < Bs <18	OK
Development Length (in):	218.95	12.00	OK
Soil moment capacity (FOS):	5.10	2.00	OK

☐ **Assume 0.33% Minimum Steel?**



Bearing: 13.0%

Steel: 42.7%

Soil: 39.2%

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#: *873633*
Site Name: *Milford*
App #: *153719*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	60	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	58	in
Thick:	3.25	in
Grade:	55	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:	49.01	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	1665	ft-kips
Unfactored Axial, P:	25	kips
Unfactored Shear, V:	18	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	81.7 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	41.9% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	27.1 ksi
Allowable PL Bending Stress:	55.0 ksi
Base Plate Stress Ratio:	49.3% **Pass**

PL Ref. Data
Yield Line (in): 33.01
Max PL Length: 33.01

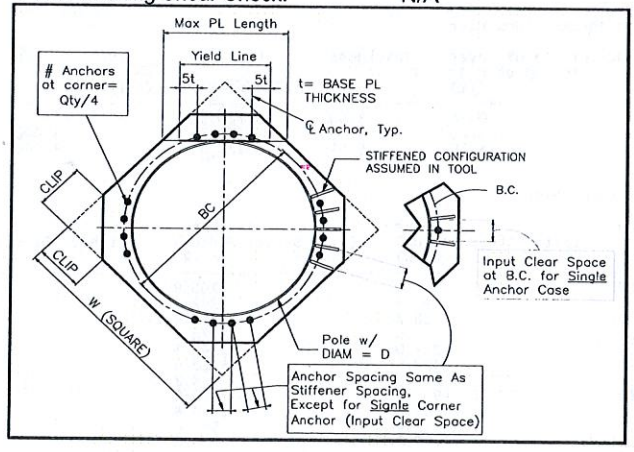
N/A - Unstiffened

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



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

CAISSON Version 10.40 10:02:45 AM Monday, July 30, 2012
Crown Castle USA

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*************************************************************************************************
*                                                                                               *
* CAISSON - Pier Foundations Analysis and Design -  Copyright Power Line Systems, Inc. 1993-2010 *
*                                                                                               *
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Project Title: BU# 873633
Project Notes:

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	0.50	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.50	0.00	120.0			
2	Sand	25.00	3.50	120.0		3.000	30.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
1665.0	25.0	18.00	5.10

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
25.500	147.203	649.6

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	3.50	120.0			0.00	2.25
Sand	4.00	14.69	120.0		3.000	1204.30	13.00
Sand	18.69	6.81	120.0		3.000	-1111.90	22.27

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	92.4	9106.9	18.1	1785.7
2.55	92.4	9342.5	18.1	1831.9
5.10	58.7	9560.4	11.5	1874.6
7.65	-54.5	9576.2	-10.7	1877.7
10.20	-217.0	9240.5	-42.5	1811.9
12.75	-428.5	8428.0	-84.0	1652.5
15.30	-689.3	7013.2	-135.2	1375.1
17.85	-999.2	4870.9	-195.9	955.1
20.40	-865.6	2290.8	-169.7	449.2
22.95	-457.4	593.6	-89.7	116.4
25.50	0.0	0.0	0.0	0.0

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

October 3, 2012

The Honorable Benjamin G. Blake
Mayor
City of Milford
Parsons Complex
70 West River Street
Milford, CT 06460-3364

RE: **EM-VER-084-121002**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 10 Bona Street, Milford, Connecticut.

Dear Mayor Blake:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by October 18, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: David Sulkis, City Planner, City of Milford

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

December 28, 2012

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-040-120906 – 60 South Main Street, East Granby, Connecticut**
EM-VER-053-120907 – 89 Dr. Nott Drive, Franklin, Connecticut
EM-VER-058-120828 – 1439 Voluntown Road, Griswold, Connecticut
EM-VER-059-120828 – 75 Roberts Road, Groton, Connecticut
EM-VER-056-121009 – 30 Higley Road, Granby, Connecticut
EM-VER-084-121002 – 10 Bona Street, Milford, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter

12012089-v1