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 9, 2012

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

RE: **EM-VER-022-100119** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 53 Westminster Road, Canterbury, Connecticut. Extension of Time.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) considered your request for an additional extension of construction time for this exempt modification, dated September 25, 2012, and granted an additional twelve-month extension of time until February 10, 2014, to complete the construction of this project with the understanding that conditions contained in the original Council decision dated February 10, 2010 and additional conditions listed in the extension letter dated February 7, 2011 are satisfied. This extension is granted with the understanding that the Council will be notified should the applicant decide not to proceed with construction.

Sincerely,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

Enclosure: Decision Letter, dated February 10, 2010
Extension Decision Letter, dated February 7, 2011

c: The Honorable Brian H. Sear, First Selectman, Town of Canterbury
Steve Sadlowski, Zoning Enforcement Officer, Town of Canterbury
Crown Castle USA, Inc.

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

September 25, 2012

Via Electronic Mail

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

Re: **EM-VER-022-100119**
53 Westminster Road, Canterbury, Connecticut

Dear Ms. Roberts:

By letter of February 10, 2010, Siting Council staff acknowledged receipt of the above-referenced exempt modification filing for Cellco's shared use of the existing tower at 53 Westminster Road in Canterbury, Connecticut. The Council's approval is due to expire on February 10, 2013. While Cellco intends to move forward with the construction, this cell site is not currently on the 2013 "build program". Cellco, therefore, requests that the Council extend the time period of this acknowledgement for an additional 12 months until February 10, 2014.

Thank you in advance for your cooperation.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Copy to:
Sandy M. Carter

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

December 8, 2011

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

RE: **EM-VER-022-100119** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 53 Westminster Road, Canterbury, Connecticut. Extension of Time.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) considered your request for an additional extension of construction time for this exempt modification, dated November 10, 2011, and granted an additional twelve-month extension of time until February 10, 2013, to complete the construction of this project with the understanding that conditions contained in the original Council decision dated February 10, 2010 and additional conditions listed in the extension letter dated February 7, 2011 are satisfied. This extension is granted with the understanding that the Council will be notified should the applicant decide not to proceed with construction.

Sincerely,

Linda Roberts
Executive Director

LR/CDM/laf

Enclosure: Decision Letter, dated February 10, 2010
Extension Decision Letter, dated February 7, 2011

c: The Honorable Brian H. Sear, First Selectman, Town of Canterbury
Steve Sadlowski, Zoning Enforcement Officer, Town of Canterbury
Crown Castle USA, Inc.

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

November 10, 2011

Via Electronic Mail

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

Re: **EM-VER-022-100119**
53 Westminster Road, Canterbury, Connecticut

Dear Ms. Roberts:

By letter of February 10, 2010, Siting Council staff acknowledged receipt of the above-referenced exempt modification filing for Cellco's shared use of the existing tower at 53 Westminster Road in Canterbury, Connecticut. The acknowledgement letter states that the validity of the staff's action will expire one year from the date of the acknowledgement letter. The Council granted Cellco a one year extension to February 10, 2012, to allow for the facility to be operational.

The purpose of this letter is to inform you that Cellco intends to move forward with the construction of this cell site, but will not do so in 2012. The construction of this facility is, however, on Cellco's construction schedule for 2013. We are, therefore, requesting that the Council staff extend the time period of its acknowledgement for an additional 12 months until February 10, 2013.

Thank you in advance for your cooperation.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Copy to:
Sandy M. Carter

11380345-v1

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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

February 7, 2011

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

RE: **EM-VER-022-100119** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 53 Westminster Road, Canterbury, Connecticut. Extension of Time.

Dear Attorney Baldwin:

Pursuant to your request dated January 26, 2011, the Connecticut Siting Council (Council) hereby extends the time period of its acknowledgement dated February 10, 2010 (filing dated January 19, 2010) for an additional 12 months until February 10, 2012 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 January 19, 2010. 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. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Brian H. Sear, First Selectman, Town of Canterbury
Steve Sadlowski, Zoning Enforcement Officer, Town of Canterbury
Crown Castle USA, Inc.

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

ORIGINAL

January 26, 2011

Via Electronic Mail

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

Re: **EM-VER-022-100119**
53 Westminster Road, Canterbury, Connecticut

Dear Ms. Roberts:

By letter of February 10, 2010, Siting Council staff acknowledged receipt of the above-referenced exempt modification filing for Cellco's shared use of the existing tower at 53 Westminster Road in Canterbury, Connecticut. The acknowledgement letter states that the validity of the staff's action will expire one year from the date of the acknowledgement letter.

The purpose of this letter is to inform you that, Cellco intends to move forward with the construction of this cell site, but will not do so in calendar year 2011. The construction of this facility is, however, on Cellco's construction schedule for 2012. We are, therefore, requesting that the Council staff extend the time period of its acknowledgement for an additional 12 months until February 10, 2012.

Thank you in advance for your cooperation.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Copy to:
Sandy M. Carter

10866734-v1

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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

February 10, 2010

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

RE: **EM-VER-022-100119** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 53 Westminster Road, Canterbury, 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.

The proposed modifications are to be implemented as specified here and in your notice dated January 19, 2010, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Brian H. Sear, First Selectman, Town of Canterbury
Steve Sadlowski, Zoning Enforcement Officer, Town of Canterbury
Crown Castle USA, Inc.

G:\EM\BAM-VERIZON\CANTERBU\dc02052010Westminster.DOC

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

January 20, 2010

The Honorable Brian H. Sear
First Selectman
Town of Canterbury
P O Box 27
Canterbury, CT 06331-0027

RE: **EM-VER-022-100119** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 53 Westminster Road, Canterbury, Connecticut.

Dear First Selectman Sear:

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 February 3, 2010.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jbw

Enclosure: Notice of Intent

c: Steve Sadlowski, Zoning Enforcement Officer, Town of Canterbury

ROBINSON & COLE

EM-VER-022-100119

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

ORIGINAL

January 19, 2010

Via Hand Delivery

RECEIVED
JAN 19 2010
CONNECTICUT
SITING COUNCIL

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification**
53 Westminster Road, Canterbury, Connecticut

Dear Mr. Phelps:

On November 7, 2001, Cellco Partnership d/b/a Verizon Wireless ("Cellco") received Connecticut Siting Council ("Council") approval to share the Crown Castle USA, Inc.("Crown") tower (TS-VER-022-011018) at 53 Westminster Road in Canterbury, Connecticut. Cellco never installed its equipment at this facility. Cellco is now prepared to install its antennas and associated equipment at this site and submits this notice accordingly.

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 Canterbury's First Selectman, Brian H. Sear. A copy of this letter is also being sent to John R. Lemire, the owner of the property on which the tower is located.

The existing facility consists of a 180-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound. The tower is shared by Sprint with antennas at the 180-foot level and AT&T with antennas at the 160-foot level on the tower. Cellco intends to install twelve (12) panel-type antennas at the 170-foot level on the tower and place a 12' x 30' equipment shelter on the ground within the existing fenced compound. Attached behind Tab 1 are Project Plans for the proposed Cellco facility.

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 170-foot level on the 180-foot tower.

2. The proposed installation of a 12' x 30' equipment shelter will not require an extension of the fenced compound or lease area.

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

4. The operation of the antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. The cumulative worst-case RF power density calculations for all existing and proposed Cellco antennas would be 16.35% of the FCC standard. A copy of the cumulative power density calculations table is attached behind Tab 2.

Also attached, behind Tab 3, is a Structural Analysis confirming that the tower and foundation can support the existing and Cellco antennas and associated equipment.

For the foregoing reasons, Cellco respectfully submits that the proposed antenna installation at the facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Attachments
Copy to:
Brian H. Sear, Canterbury First Selectman
John R. Lemire
Sandy M. Carter

verizon wireless

CANTERBURY CT

53 WESTMINSTER ROAD
CANTERBURY, CONNECTICUT 06331

GENERAL NOTES

1. THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND POSITIONS OF ALL PROJECT OWNER'S EQUIPMENT ARE SHOWN IN ILLUSTRATIVE FASHION. THESE DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. ACTUAL HARDWARE DETAILS AND FINAL LOCATIONS MAY DIFFER SLIGHTLY FROM WHAT IS SHOWN.

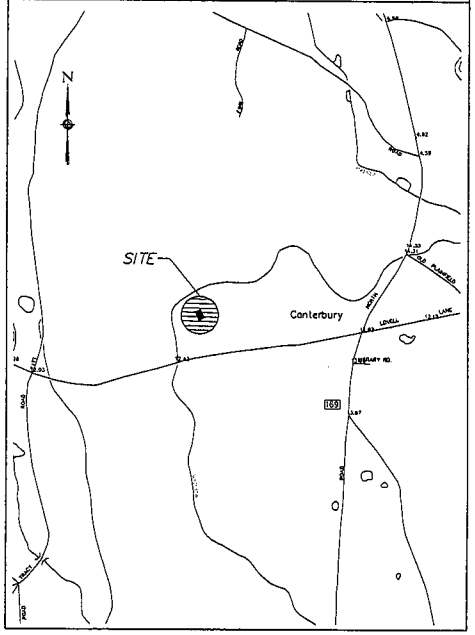
2. THE PROJECT OWNER'S PCS FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. THE DESIGN OF THE ANTENNA MOUNTING HARDWARE WILL MEET THE ANSI/EIA/TIA-222-F STANDARDS FOR STRUCTURAL STEEL ANTENNA SUPPORTING STRUCTURES AND STATE BUILDING CODE REQUIREMENTS. DETAILED CONSTRUCTION DRAWINGS AND STRUCTURAL CALCULATIONS WILL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED WITH A BUILDING PERMIT APPLICATION FOR REVIEW AND APPROVAL BY THE LOCAL BUILDING CODE ENFORCEMENT OFFICIAL.

4. ONCE THE FACILITY BECOMES FULLY OPERATIONAL, NORMAL AND ROUTINE MAINTENANCE BY PROJECT OWNER'S TECHNICIANS WILL BE PERFORMED ON A MONTHLY BASIS. THEREFORE, THE ESTIMATED VEHICLE TRIP GENERATION RATE IS 2 TRIPS PER MONTH. THE AVERAGE DAILY TRIP GENERATION RATE (ADT) IS 0.07.

VICINITY MAP

SCALE: N.T.S.



PROJECT SUMMARY

SITE NAME:	CANTERBURY CT
SITE ADDRESS:	53 WESTMINSTER ROAD CANTERBURY, CONNECTICUT 06331
CONTACT PERSON:	VERIZON WIRELESS BRIAN RAGOZZINE (860) 982-4246
TOWER OWNER:	CROWN CASTLE 46 BROADWAY ALBANY, NY 12204
GOVERNING CODE:	CONNECTICUT BUILDING CODES CONNECTICUT LIFE SAFETY CODES
JURISDICTION:	CONNECTICUT SITING COUNCIL
APPLICANT:	VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT. 06108
ARCHITECT:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067
M/E/P ENGINEER:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067
LATITUDE:	41° 42' 07.15" NAD 83
LONGITUDE:	71° 58' 51.84" NAD 83

LEGEND

SYMBOL	DESCRIPTION
	SECTION OR DETAIL NUMBER SHEET WHERE DETAIL/SECTION OCCURS
	ELEVATION NUMBER SHEET WHERE ELEVATION OCCURS

ABBREVIATIONS

MIN.	MINIMUM
V.I.F.	VERIFY IN FIELD
O.C.	ON CENTER
PSF	POUND/SQUARE FOOT
TYP.	TYPICAL
TOC	TOP OF CONCRETE
TOW	TOP OF WALL
FT.	FEET
SQ.FT.	SQUARE FEET
N/A	NOT APPLICABLE

SHEET INDEX

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET – GENERAL NOTES AND LEGENDS
SC-1	COMPOUND PLAN, ELEVATION AND ANTENNA ORIENTATION PLAN

CELLCO PARTNERSHIP
DBA
verizon wireless

A&E FIRM
URS CORPORATION AES
500 ENTERPRISE DRIVE
SUITE 3B
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

A&E SEAL

SITE NAME: CANTERBURY CT
PROJECT ID: 2009383594
PROJECT TYPE: BDGCO
LOCATION CODE: 118601
SITE ADDRESS:
53 WESTMINSTER ROAD
CANTERBURY, CONNECTICUT
06331

PROJECT NO:	36931182
JOB NO:	VZS-035
DRAWN BY:	KAP
CHECKED BY:	MJE

ISSUED FOR

A	01-07-10	REVIEW

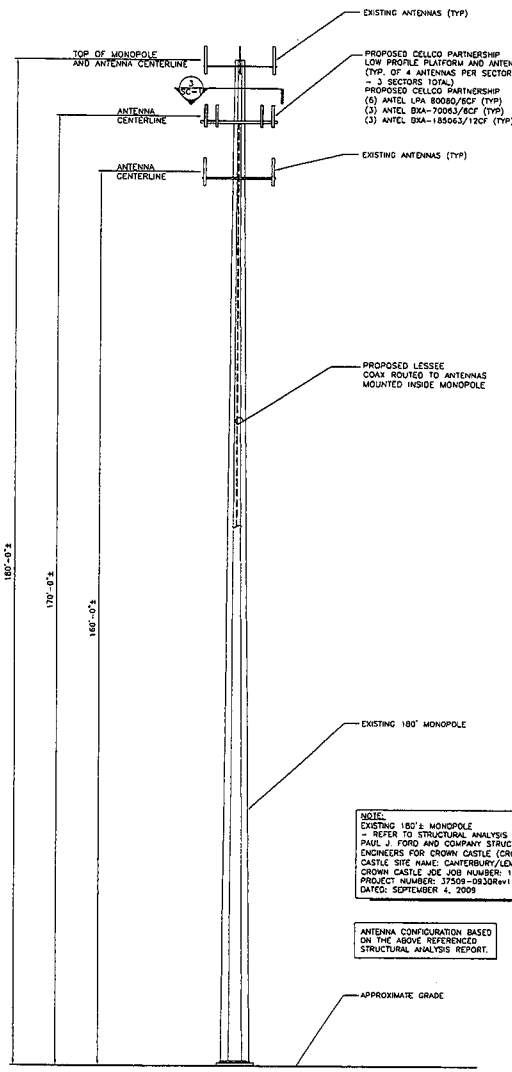
CANTERBURY CT

53 WESTMINSTER ROAD
CANTERBURY, CONNECTICUT
06331

SCALE: AS NOTED

TITLE SHEET - PROJECT SUMMARY AND LEGENDS

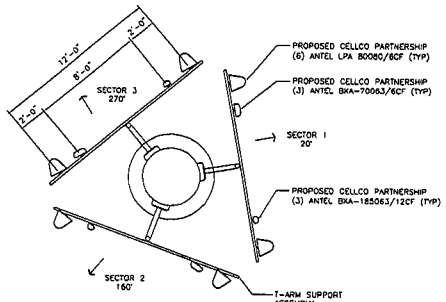
T-1



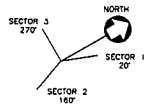
2 SC-1 MONOPOLE ELEVATION
SCALE: 1"=10'-0"

NOTE:
EXISTING 180'± MONOPOLE – REFER TO STRUCTURAL ANALYSIS BY PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS FOR CROWN CASTLE (CROWN CASTLE SITE NAME: CANTERBURY/LEWIRE CROWN CASTLE JDE JOB NUMBER: 124367) PROJECT NUMBER: 37509-0930Rev1 DATED: SEPTEMBER 4, 2009

ANTENNA CONFIGURATION BASED ON THE ABOVE REFERENCED STRUCTURAL ANALYSIS REPORT.



3 SC-1 ANTENNA ORIENTATION PLAN
SCALE: N.T.S.

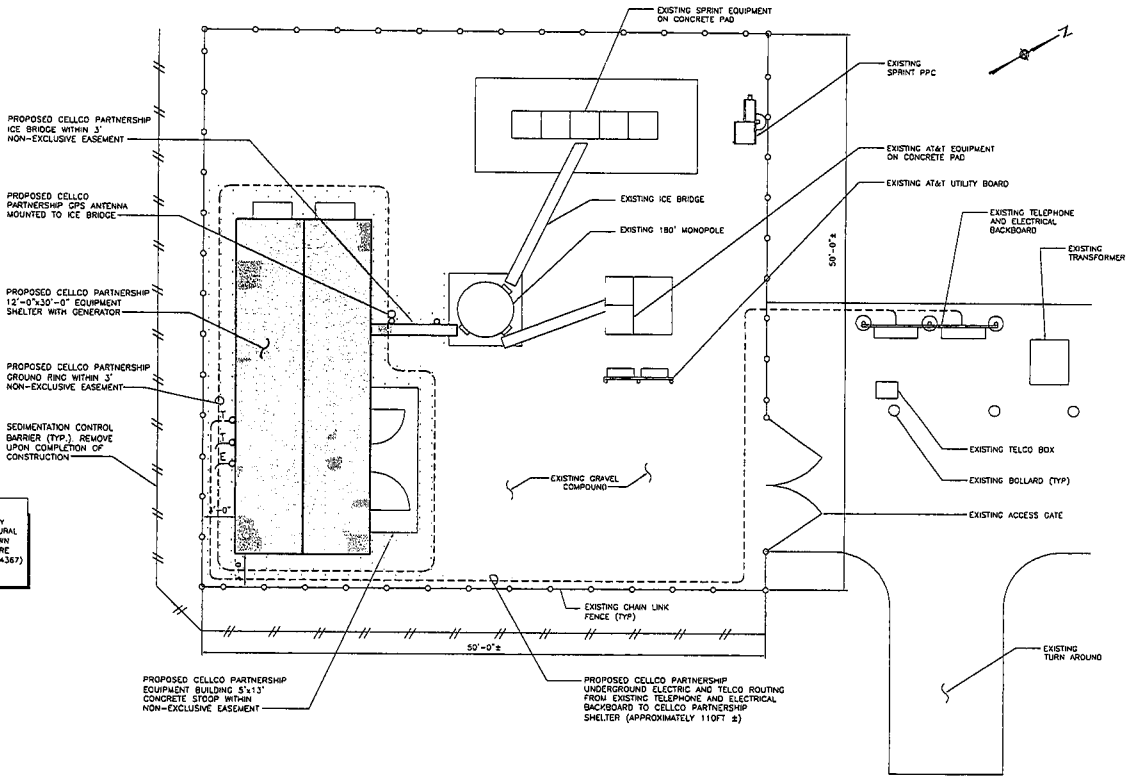


ANTENNA ORIENTATION KEY

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
LEASE LINE		
CHAIN LINK FENCE		
CONTOUR LINES	123	
UNDERGROUND UTILITIES		E/T
UTILITY POLE	⌀	⌀
TREE LINE		
SEDIMENTATION FENCE		
SPOT ELEVATION	x 124.5	
WOOD FENCE		

SITE PLAN INFORMATION

THIS SITE PLAN DRAWING WAS COMPILED FROM DATA COLLECTED IN THE FIELD AND FROM AVAILABLE EXISTING DRAWINGS OF THE SUBJECT AREA.



1 SC-1 COMPOUND PLAN
SCALE: 1"=5'-0"

CELLCO PARTNERSHIP
DBA
verizon wireless

A&E FIRM
URS CORPORATION AES
500 ENTERPRISE DRIVE
SUITE 3B
ROCKY HILL, CONNECTICUT
1-(860)-529-9882

A&E SEAL

SITE NAME: CANTERBURY CT
PROJECT ID: 20093B3594
PROJECT TYPE: BDCCO
LOCATION CODE: 118601
SITE ADDRESS:
53 WESTMINSTER ROAD
CANTERBURY, CONNECTICUT
06331

PROJECT NO: 36931182
JOB NO: VZ5-035
DRAWN BY: KAP
CHECKED BY: MJE

ISSUED FOR

A	01-07-10	REVIEW

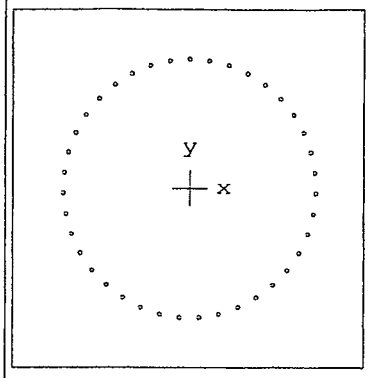
CANTERBURY CT
53 WESTMINSTER ROAD
CANTERBURY, CONNECTICUT
06331

SCALE: AS NOTED

COMPOUND PLAN, ELEVATION AND ANTENNA ORIENTATION PLAN

SC-1

	General	Power	Density					
Site Name: Canterbury								
Tower Height: Verizon @ 170ft								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Sprint			180	0.0149	1962	1.0000	1.49%	
*Cingular UMTS	1	500	161	0.0069	880	0.5867	1.18%	
*Cingular GSM	4	296	161	0.0164	880	0.5867	2.80%	
*Cingular GSM	2	427	161	0.0118	1900	1.0000	1.18%	
Verizon	**7**	**209**	**170**	**0.0182**	**1970**	**1.0000**	**1.82%**	
Verizon	**9**	**314**	**170**	**0.0352**	**869**	**0.5793**	**6.07%**	
Verizon	**1**	**723**	**170**	**0.0090**	**757**	**0.4973**	**1.81%**	
								16.35%
* Source: Siting Council								



78 x 78 in

Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

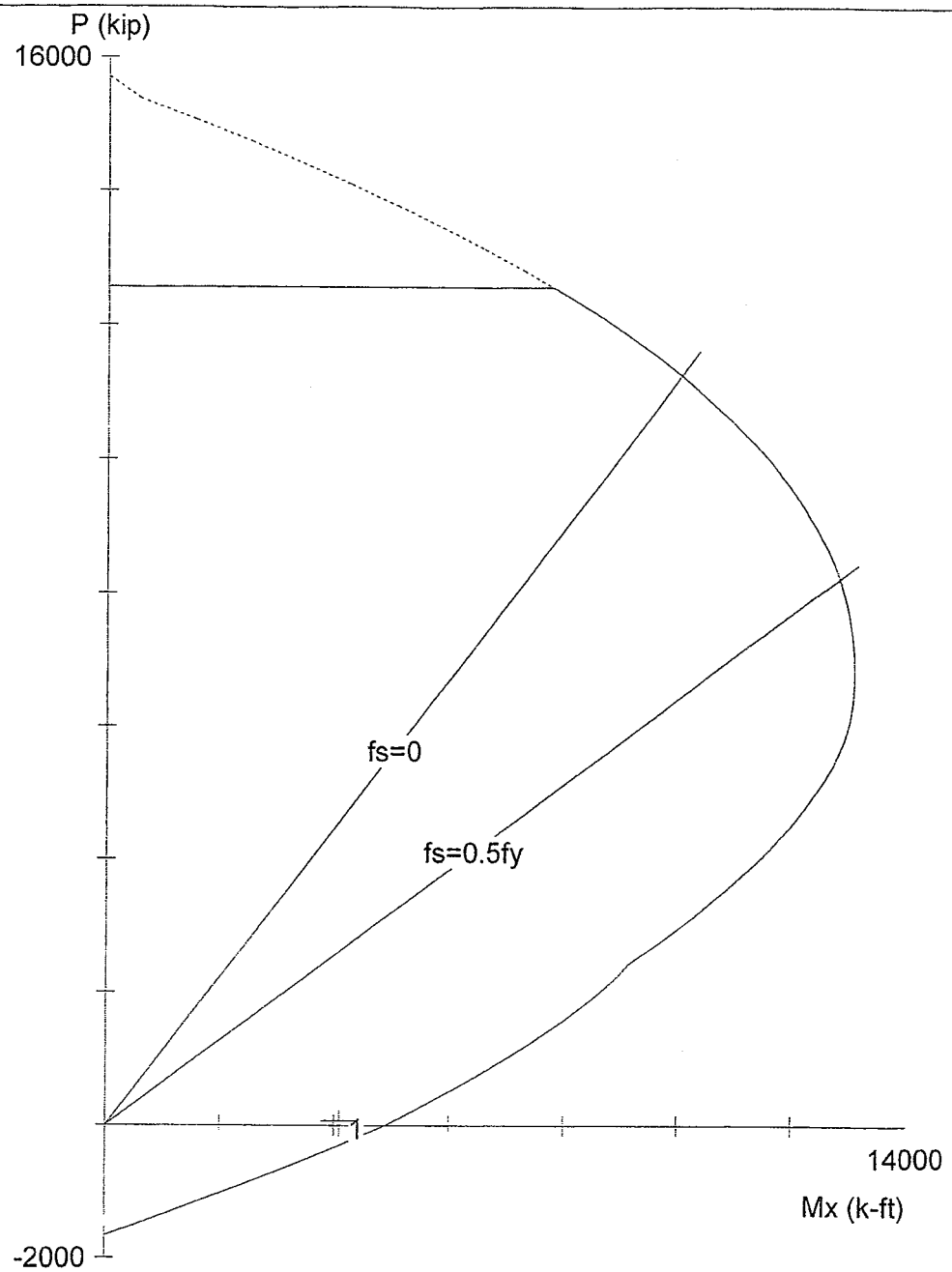
Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 09/04/09

Time: 10:18:18



PCACOL V3.00 (PCA 1999) - Licensed to: Paul J. Ford and Company, Columbus, OH

File: untitled.col

Project: 37509-0930Rev1

Column:		Engineer:	
f'c = 4 ksi	fy = 60 ksi	Ag = 6084 in^2	39 #8 bars
Ec = 3605 ksi	Es = 29000 ksi	As = 30.81 in^2	Rho = 0.51%
fc = 3.4 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 3.08459e+006 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 3.08459e+006 in^4
Beta1 = 0.85		Clear spacing = 3.53 in	Clear cover = 10.38 in

General Information:
==========

File Name: untitled.col
Project: 37509-0930Rev1
Column: Engineer:
Code: ACI 318-95 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========

f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
fc = 3.4 ksi Rupture strain = Infinity
Ultimate strain = 0.003 in/in
Betal = 0.85

Section:
==========

Rectangular: Width = 78 in Depth = 78 in

Gross section area, Ag = 6084 in^2
Ix = 3.08459e+006 in^4 Iy = 3.08459e+006 in^4
Xo = 0 in Yo = 0 in

Reinforcement:
==========

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area, As = 30.81 in^2 at 0.51%
39 #8 Cover = 10 in

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)
==========

No.	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	69.0	4096.0	5052.8	1.234

*** Program completed as requested! ***

PJF job no. **37509-0930** Project name **BU# 876375**

Foundation Loads:

Tower leg compression =	**34**	(kips)
Horizontal load at top of pier =	**24**	(kips)
Overturning moment at top of pier=	**3088**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**125**	(pcf)
Allowable soil bearing =	**6**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**6.5**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**5.5**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**24.5**	(ft)
Footing length =	**24.5**	(ft)

Concrete:

Concrete strength =	**4**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

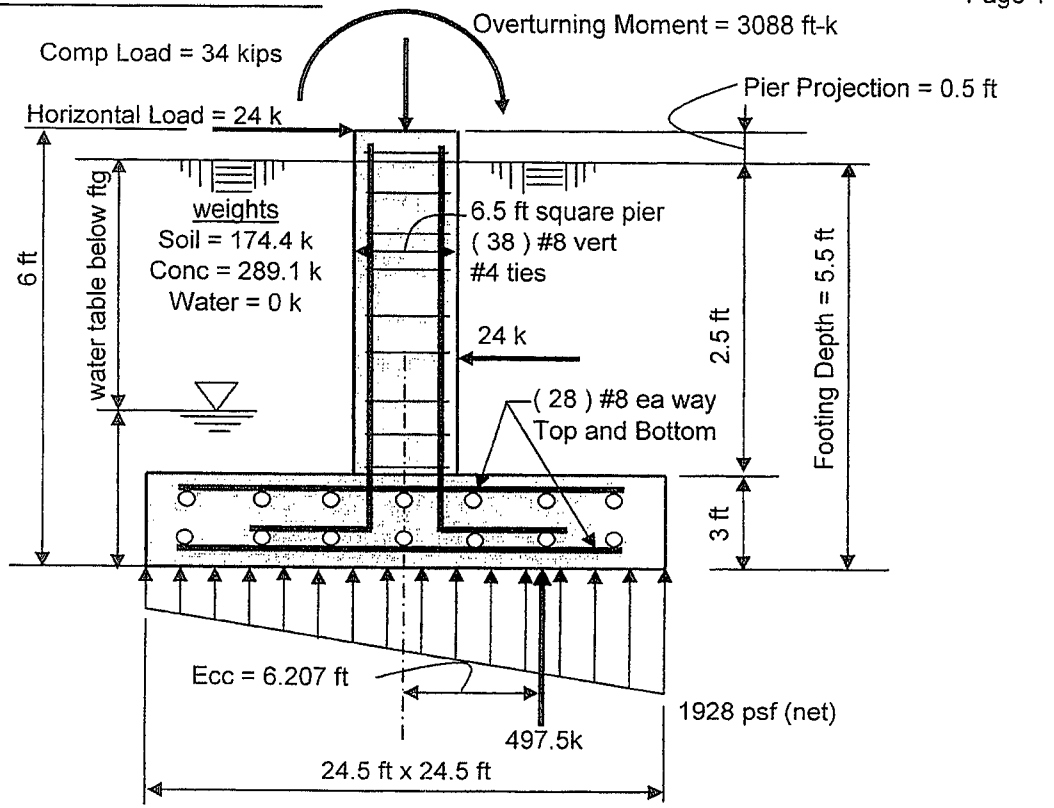
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#8**	bar
quantity of pad rebar =	**28**	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#8**	bar
vertical rebar quantity =	**38**	
size of pier ties =	**#4**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 71.4 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 1.928 ksf Allowable Net Soil Bearing = 6 ksf **Soil Bearing Stress Ratio = 0.32 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 31 psi **Bending Shear Stress Ratio = 0.25 Okay**
Ftg Overturning Resistance = 6094 ft-kips Overturning Moment = 3088 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.974 **Ratio = 0.76 Okay**	Pad Bending Moment Capacity= 3069 ft-k Pad Bending Moment = 1428 ft-k **Bending Moment Stress Ratio = 0.47 OK**

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

Site Data

BU#:
Site Name:
App #:

Connection Type:	*Butt*

Reactions		
Moment:	3088	ft-kips
Axial:	34	kips
Shear:	24	kips

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

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

Plate Data		
Diam:	65	in
Thick:	2	in
Grade:	50	ksi
Single-Rod B-eff:	9.92	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.5	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	50	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	

Anchor Rod Results

Maximum Rod Tension:	152.3 Kips	
Allowable Tension:	195.0 Kips	
Anchor Rod Stress Ratio:	78.1% **Pass**	

Stiffened
Service, ASD
Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	39.8 ksi	
Allowable Plate Stress:	50.0 ksi	
Base Plate Stress Ratio:	79.7% **Pass**	

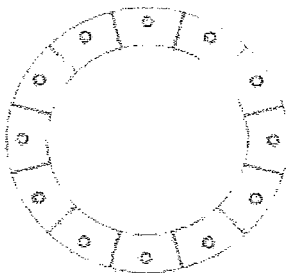
Stiffened
Service, ASD
0.75*Fy*ASIF
Y.L. Length: N/A, Roark

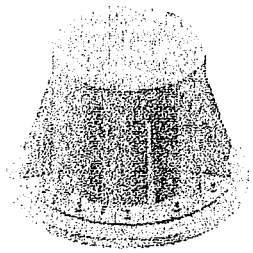
Stiffener Results

Horizontal Weld :	55.0% **Pass**
Vertical Weld:	56.9% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	13.7% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	55.5% **Pass**
Plate Comp. (AISC Bracket):	56.5% **Pass**

Pole Results

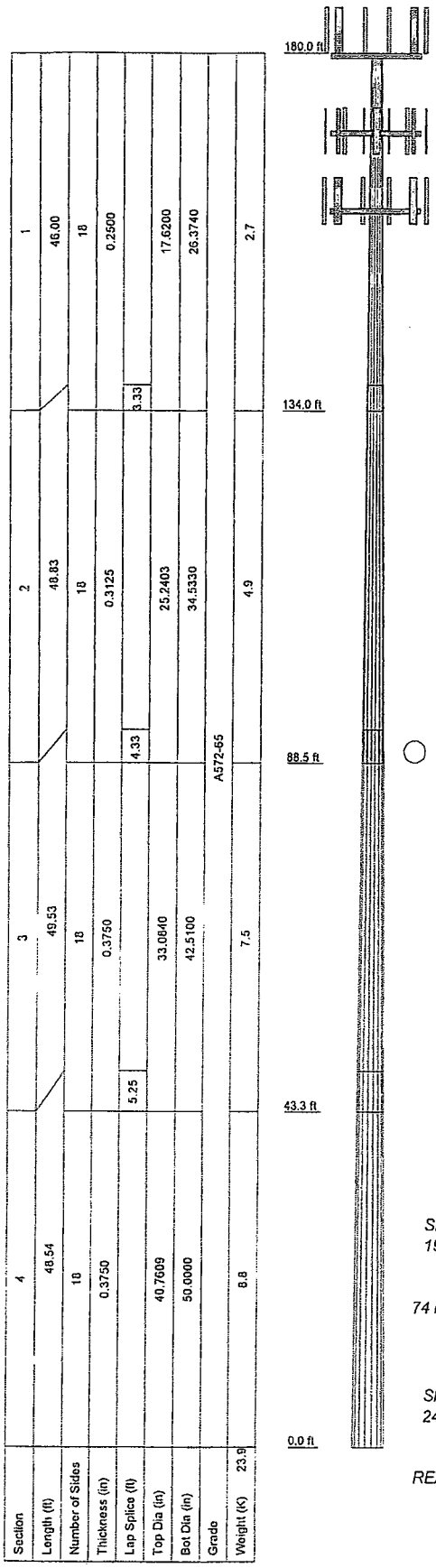
Pole Punching Shear Check:	12.8% **Pass**





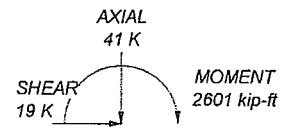
* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

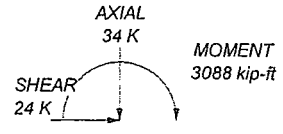


Section	1	2	3	4
Length (ft)	46.00	48.83	49.53	49.54
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750
Lap Splice (ft)	3.33	4.33	5.25	
Top Dia (in)	17.6200	25.2403	33.0640	40.7609
Bot Dia (in)	26.3740	34.5330	42.5100	50.0000
Grade				
Weight (K)	2.7	4.9	7.5	8.8

Total Weight (K) 23.9



TORQUE 0 kip-ft
74 mph WIND - 0.5000 in ICE



TORQUE 0 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) FV65-14-00NA2 w/Mount Pipe	183	(2) Antel LPA-80080/6CF w/mount pipe	170
(2) FV65-14-00NA2 w/Mount Pipe	183	12' Low Profile Platform (LP 303-1)	170
(2) FV65-14-00NA2 w/Mount Pipe	183	(2) 7770.00 w/ Mount Pipe	161
12' Low Profile Platform (LP 717-1)	180	(2) 7770.00 w/ Mount Pipe	161
Antel BXA-70063/6CF w/ Mount Pipe	170	(2) 7770.00 w/ Mount Pipe	161
Antel BXA-70063/6CF w/ Mount Pipe	170	(2) LGP21401	161
Antel BXA-70063/6CF w/ Mount Pipe	170	(2) LGP21401	161
Antel BXA-185063/12CF w/Mount Pipe	170	(2) LGP21401	161
Antel BXA-185063/12CF w/Mount Pipe	170	(2) Powerwave LGP21901	161
Antel BXA-185063/12CF w/Mount Pipe	170	(2) Powerwave LGP21901	161
(2) Antel LPA-80080/6CF w/mount pipe	170	(2) Powerwave LGP21901	161
(2) Antel LPA-80080/6CF w/mount pipe	170	12' Low Profile Platform (LP 303-1)	160
		Spectracom 8225	79
		3' Side Arm Mount	78

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 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.6%

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: *Ex. 180-Ft Monopole: Canterbury*		
Project: *37509-0930Rev1 / BU #876375*		
Client: CCI	Drawn by: Christina Hedges	App'd:
Code: TIA/EIA-222-F	Date: 09/04/09	Scale: NTS
Path: T:\376_Crown_Cases\37509-0930 BU 876375\37509-0930Rev1 WO 287648\37509-0930Rev1.eri		Dwg No. E-1

APPENDIX C

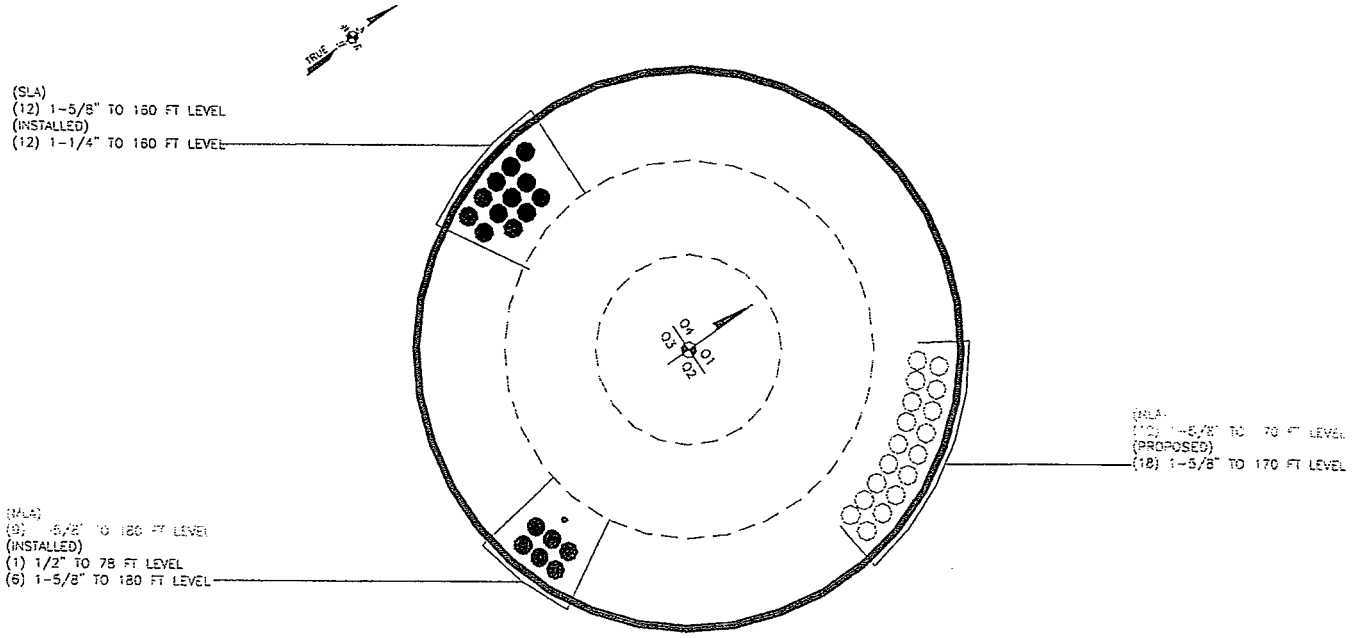
Table C1 - List of Attached Documents

Attachment
ERI Monopole Profile
Base Plate Calculations
Foundation Calculations

Program Version 5.3.1.0 - 10/3/2008 File:T:/375_Crown_Castle/2009/37509-0930 BU 876375/37509-0930Rev1 WO 292648/37509-0930Rev1.eri

APPENDIX B

Cable Routing Drawing



Pole Interaction Design Data

Section No.	Elevation ft	Ratio P / P_a	Ratio f_{bx} / F_{bx}	Ratio f_{by} / F_{by}	Ratio f_v / F_v	Ratio f_{vt} / F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 134 (1)	0.008	1.087	0.000	0.054	0.000	1.096 ✓	1.333	H1-3+VT ✓
L2	134 - 88.497 (2)	0.010	1.303	0.000	0.041	0.000	1.314 ✓	1.333	H1-3+VT ✓
L3	88.497 - 43.294 (3)	0.012	1.243	0.000	0.033	0.000	1.255 ✓	1.333	H1-3+VT ✓
L4	43.294 - 0 (4)	0.015	1.313	0.000	0.031	0.000	1.328 ✓	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	180 - 134	Pole	TP26.374x17.62x0.25	1	-6.35	1051.52	82.2	Pass
L2	134 - 88.497	Pole	TP34.533x25.2403x0.3125	2	-12.86	1722.08	98.6	Pass
L3	88.497 - 43.294	Pole	TP42.51x33.084x0.375	3	-22.07	2545.39	94.2	Pass
L4	43.294 - 0	Pole	TP50x40.7609x0.375	4	-34.00	3043.84	99.6	Pass
							Summary	
						Pole (L4)	99.6	Pass
						RATING =	99.6	Pass

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					
180.00	12' Low Profile Platform (LP 717-1)	8	187.622	9.7807	0.0003	6664
170.00	Antel BXA-70063/6CF w/ Mount Pipe	8	167.507	9.4060	0.0003	3330
161.00	(2) 7770.00 w/ Mount Pipe	8	149.714	9.0501	0.0003	1749
160.00	12' Low Profile Platform (LP 303-1)	8	147.768	9.0087	0.0003	1661
79.00	Spectracom 8225	8	33.126	3.9787	0.0003	956
78.00	3' Side Arm Mount	8	32.258	3.9183	0.0003	954

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	180 - 134 (1)	TP26.374x17.62x0.25	46.00	0.00	0.0	39.000	20.2265	-6.35	788.84	0.008
L2	134 - 88.497 (2)	TP34.533x25.2403x0.3125	48.83	0.00	0.0	39.000	33.1252	-12.86	1291.88	0.010
L3	88.497 - 43.294 (3)	TP42.51x33.084x0.375	49.53	0.00	0.0	39.000	48.9621	-22.07	1909.52	0.012
L4	43.294 - 0 (4)	TP50x40.7609x0.375	48.54	0.00	0.0	39.000	58.5500	-34.00	2283.45	0.015

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	180 - 134 (1)	TP26.374x17.62x0.25	448.55	42.389	39.000	1.087	0.00	0.000	39.000	0.000
L2	134 - 88.497 (2)	TP34.533x25.2403x0.3125	1154.64	50.832	39.000	1.303	0.00	0.000	39.000	0.000
L3	88.497 - 43.294 (3)	TP42.51x33.084x0.375	2005.91	48.493	39.000	1.243	0.00	0.000	39.000	0.000
L4	43.294 - 0 (4)	TP50x40.7609x0.375	3033.85	51.214	39.000	1.313	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	180 - 134 (1)	TP26.374x17.62x0.25	14.21	0.702	26.000	0.054	0.00	0.000	26.000	0.000
L2	134 - 88.497 (2)	TP34.533x25.2403x0.3125	17.52	0.529	26.000	0.041	0.00	0.000	26.000	0.000
L3	88.497 - 43.294 (3)	TP42.51x33.084x0.375	20.82	0.425	26.000	0.033	0.00	0.000	26.000	0.000
L4	43.294 - 0 (4)	TP50x40.7609x0.375	23.67	0.404	26.000	0.031	0.00	0.000	26.000	0.000

31	Yes	5	0.00000001	0.00040313
32	Yes	5	0.00000001	0.00040236
33	Yes	4	0.00000001	0.00056461
34	Yes	5	0.00000001	0.00040236
35	Yes	5	0.00000001	0.00040313
36	Yes	4	0.00000001	0.00056489
37	Yes	5	0.00000001	0.00040208
38	Yes	5	0.00000001	0.00040285

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	65.493	33	3.4104	0.0001
L2	137.33 - 88.497	37.067	33	2.7542	0.0001
L3	92.827 - 43.294	16.147	33	1.6938	0.0001
L4	48.544 - 0	4.339	33	0.8335	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.00	(2) FV65-14-00NA2 w/Mount Pipe	33	65.493	3.4104	0.0001	18204
180.00	12' Low Profile Platform (LP 717-1)	33	65.493	3.4104	0.0001	18204
170.00	Antel BXA-70063/6CF w/ Mount Pipe	33	58.451	3.2774	0.0001	9101
161.00	(2) 7770.00 w/ Mount Pipe	33	52.223	3.1518	0.0001	4789
160.00	12' Low Profile Platform (LP 303-1)	33	51.542	3.1372	0.0001	4549
79.00	Spectracom 8225	33	11.519	1.3602	0.0001	2720
78.00	3' Side Arm Mount	33	11.217	1.3375	0.0001	2714

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	187.622	8	9.7807	0.0003
L2	137.33 - 88.497	106.386	8	7.9053	0.0003
L3	92.827 - 43.294	46.418	8	4.8686	0.0003
L4	48.544 - 0	12.487	8	2.3983	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.00	(2) FV65-14-00NA2 w/Mount	8	187.622	9.7807	0.0003	6664

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
13	-11.82	-34.29	-20.47	11.82	34.29	20.47	0.000%
14	0.00	-41.30	0.00	0.00	41.30	0.00	0.000%
15	0.00	-41.30	-19.13	0.00	41.30	19.13	0.000%
16	9.56	-41.30	-16.56	-9.56	41.30	16.56	0.000%
17	16.56	-41.30	-9.56	-16.56	41.30	9.56	0.000%
18	19.13	-41.30	0.00	-19.13	41.30	-0.00	0.000%
19	16.56	-41.30	9.56	-16.56	41.30	-9.56	0.000%
20	9.56	-41.30	16.56	-9.56	41.30	-16.56	0.000%
21	0.00	-41.30	19.13	0.00	41.30	-19.13	0.000%
22	-9.56	-41.30	16.56	9.56	41.30	-16.56	0.000%
23	-16.56	-41.30	9.56	16.56	41.30	-9.56	0.000%
24	-19.13	-41.30	0.00	19.13	41.30	-0.00	0.000%
25	-16.56	-41.30	-9.56	16.56	41.30	9.56	0.000%
26	-9.56	-41.30	-16.56	9.56	41.30	16.56	0.000%
27	0.00	-34.29	-8.18	0.00	34.29	8.18	0.000%
28	4.09	-34.29	-7.08	-4.09	34.29	7.08	0.000%
29	7.08	-34.29	-4.09	-7.08	34.29	4.09	0.000%
30	8.18	-34.29	0.00	-8.18	34.29	-0.00	0.000%
31	7.08	-34.29	4.09	-7.08	34.29	-4.09	0.000%
32	4.09	-34.29	7.08	-4.09	34.29	-7.08	0.000%
33	0.00	-34.29	8.18	0.00	34.29	-8.18	0.000%
34	-4.09	-34.29	7.08	4.09	34.29	-7.08	0.000%
35	-7.08	-34.29	4.09	7.08	34.29	-4.09	0.000%
36	-8.18	-34.29	0.00	8.18	34.29	-0.00	0.000%
37	-7.08	-34.29	-4.09	7.08	34.29	4.09	0.000%
38	-4.09	-34.29	-7.08	4.09	34.29	7.08	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	5	0.00000001	0.00001142
3	Yes	6	0.00000001	0.00022767
4	Yes	6	0.00000001	0.00022740
5	Yes	5	0.00000001	0.00001288
6	Yes	6	0.00000001	0.00022775
7	Yes	6	0.00000001	0.00022748
8	Yes	5	0.00000001	0.00001142
9	Yes	6	0.00000001	0.00022748
10	Yes	6	0.00000001	0.00022775
11	Yes	5	0.00000001	0.00001288
12	Yes	6	0.00000001	0.00022740
13	Yes	6	0.00000001	0.00022767
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00005234
16	Yes	6	0.00000001	0.00078503
17	Yes	6	0.00000001	0.00078415
18	Yes	5	0.00000001	0.00005442
19	Yes	6	0.00000001	0.00078535
20	Yes	6	0.00000001	0.00078447
21	Yes	5	0.00000001	0.00005234
22	Yes	6	0.00000001	0.00078447
23	Yes	6	0.00000001	0.00078535
24	Yes	5	0.00000001	0.00005442
25	Yes	6	0.00000001	0.00078415
26	Yes	6	0.00000001	0.00078503
27	Yes	4	0.00000001	0.00056450
28	Yes	5	0.00000001	0.00040285
29	Yes	5	0.00000001	0.00040208
30	Yes	4	0.00000001	0.00056489

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+Wind 0 deg - No Ice	34.29	0.00	-23.64	-3087.46	0.00	0.00
Dead+Wind 30 deg - No Ice	34.29	11.82	-20.47	-2673.81	-1543.76	0.06
Dead+Wind 60 deg - No Ice	34.29	20.47	-11.82	-1543.70	-2673.87	0.11
Dead+Wind 90 deg - No Ice	34.29	23.64	0.00	0.06	-3087.52	0.12
Dead+Wind 120 deg - No Ice	34.29	20.47	11.82	1543.82	-2673.87	0.11
Dead+Wind 150 deg - No Ice	34.29	11.82	20.47	2673.93	-1543.76	0.06
Dead+Wind 180 deg - No Ice	34.29	0.00	23.64	3087.57	0.00	0.00
Dead+Wind 210 deg - No Ice	34.29	-11.82	20.47	2673.93	1543.76	-0.06
Dead+Wind 240 deg - No Ice	34.29	-20.47	11.82	1543.82	2673.87	-0.11
Dead+Wind 270 deg - No Ice	34.29	-23.64	0.00	0.06	3087.52	-0.12
Dead+Wind 300 deg - No Ice	34.29	-20.47	-11.82	-1543.70	2673.87	-0.11
Dead+Wind 330 deg - No Ice	34.29	-11.82	-20.47	-2673.81	1543.76	-0.06
Dead+Ice	41.30	0.00	0.00	0.09	0.00	0.00
Dead+Wind 0 deg+Ice	41.30	0.00	-19.13	-2601.30	0.00	0.00
Dead+Wind 30 deg+Ice	41.30	9.56	-16.56	-2252.79	-1300.70	0.06
Dead+Wind 60 deg+Ice	41.30	16.56	-9.56	-1300.61	-2252.88	0.11
Dead+Wind 90 deg+Ice	41.30	19.13	0.00	0.09	-2601.40	0.12
Dead+Wind 120 deg+Ice	41.30	16.56	9.56	1300.80	-2252.88	0.11
Dead+Wind 150 deg+Ice	41.30	9.56	16.56	2252.98	-1300.70	0.06
Dead+Wind 180 deg+Ice	41.30	0.00	19.13	2601.49	0.00	0.00
Dead+Wind 210 deg+Ice	41.30	-9.56	16.56	2252.98	1300.70	-0.06
Dead+Wind 240 deg+Ice	41.30	-16.56	9.56	1300.80	2252.88	-0.11
Dead+Wind 270 deg+Ice	41.30	-19.13	0.00	0.09	2601.40	-0.12
Dead+Wind 300 deg+Ice	41.30	-16.56	-9.56	-1300.61	2252.88	-0.11
Dead+Wind 330 deg+Ice	41.30	-9.56	-16.56	-2252.79	1300.70	-0.06
Dead+Wind 0 deg - Service	34.29	0.00	-8.18	-1072.09	0.00	0.00
Dead+Wind 30 deg - Service	34.29	4.09	-7.08	-928.47	-536.08	0.02
Dead+Wind 60 deg - Service	34.29	7.08	-4.09	-536.03	-928.52	0.04
Dead+Wind 90 deg - Service	34.29	8.18	0.00	0.06	-1072.15	0.04
Dead+Wind 120 deg - Service	34.29	7.08	4.09	536.14	-928.52	0.04
Dead+Wind 150 deg - Service	34.29	4.09	7.08	928.58	-536.08	0.02
Dead+Wind 180 deg - Service	34.29	0.00	8.18	1072.21	0.00	0.00
Dead+Wind 210 deg - Service	34.29	-4.09	7.08	928.58	536.08	-0.02
Dead+Wind 240 deg - Service	34.29	-7.08	4.09	536.14	928.52	-0.04
Dead+Wind 270 deg - Service	34.29	-8.18	0.00	0.06	1072.15	-0.04
Dead+Wind 300 deg - Service	34.29	-7.08	-4.09	-536.03	928.52	-0.04
Dead+Wind 330 deg - Service	34.29	-4.09	-7.08	-928.47	536.08	-0.02

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-34.29	0.00	0.00	34.29	0.00	0.000%
2	0.00	-34.29	-23.64	0.00	34.29	23.64	0.000%
3	11.82	-34.29	-20.47	-11.82	34.29	20.47	0.000%
4	20.47	-34.29	-11.82	-20.47	34.29	11.82	0.000%
5	23.64	-34.29	0.00	-23.64	34.29	0.00	0.000%
6	20.47	-34.29	11.82	-20.47	34.29	-11.82	0.000%
7	11.82	-34.29	20.47	-11.82	34.29	-20.47	0.000%
8	0.00	-34.29	23.64	0.00	34.29	-23.64	0.000%
9	-11.82	-34.29	20.47	11.82	34.29	-20.47	0.000%
10	-20.47	-34.29	11.82	20.47	34.29	-11.82	0.000%
11	-23.64	-34.29	0.00	23.64	34.29	0.00	0.000%
12	-20.47	-34.29	-11.82	20.47	34.29	11.82	0.000%

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	180 - 134	Pole	Max Tension	33	0.00	0.00	0.00
			Max. Compression	14	-12.02	0.00	0.00
			Max. Mx	5	-6.35	-448.55	-0.00
			Max. My	8	-6.35	0.00	-448.55
			Max. Vy	5	14.21	-448.55	-0.00
			Max. Vx	8	14.21	0.00	-448.55
			Max. Torque	17			0.00
L2	134 - 88.497	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.91	0.00	0.00
			Max. Mx	5	-12.86	-1154.64	-0.01
			Max. My	8	-12.86	0.00	-1154.64
			Max. Vy	5	17.52	-1154.64	-0.01
			Max. Vx	8	17.52	0.00	-1154.64
			Max. Torque	5			0.00
L3	88.497 - 43.294	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.57	0.00	-0.09
			Max. Mx	5	-22.07	-2005.85	-0.06
			Max. My	8	-22.07	0.00	-2005.91
			Max. Vy	5	20.82	-2005.85	-0.06
			Max. Vx	8	20.82	0.00	-2005.91
			Max. Torque	5			-0.13
L4	43.294 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.30	0.00	-0.09
			Max. Mx	5	-34.27	-3087.52	-0.06
			Max. My	8	-34.27	0.00	-3087.57
			Max. Vy	5	23.67	-3087.52	-0.06
			Max. Vx	8	23.67	0.00	-3087.57
			Max. Torque	5			-0.13

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	41.30	0.00	-19.13
	Max. H_x	11	34.29	23.64	0.00
	Max. H_z	2	34.29	0.00	23.64
	Max. M_x	2	3087.46	0.00	23.64
	Max. M_z	5	3087.52	-23.64	0.00
	Max. Torsion	11	0.12	23.64	0.00
	Min. Vert	1	34.29	0.00	0.00
	Min. H_x	5	34.29	-23.64	0.00
	Min. H_z	8	34.29	0.00	-23.64
	Min. M_x	8	-3087.57	0.00	-23.64
	Min. M_z	11	-3087.52	23.64	0.00
	Min. Torsion	5	-0.12	-23.64	0.00

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	34.29	0.00	0.00	0.05	0.00	0.00

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.00-134.00	155.71	1.558	10	84.322	A	0.000	84.322	84.322	100.00	0.000	0.000
					B	0.000	84.322		100.00	0.000	0.000
					C	0.000	84.322		100.00	0.000	0.000
L2 134.00-88.50	110.49	1.412	9	114.529	A	0.000	114.529	114.529	100.00	0.000	0.000
					B	0.000	114.529		100.00	0.000	0.000
					C	0.000	114.529		100.00	0.000	0.000
L3 88.50-43.29	65.61	1.217	8	143.930	A	0.000	143.930	143.930	100.00	0.000	0.000
					B	0.000	143.930		100.00	0.000	0.000
					C	0.000	143.930		100.00	0.000	0.000
L4 43.29-0.00	21.00	1	6	165.528	A	0.000	165.528	165.528	100.00	0.000	0.000
					B	0.000	165.528		100.00	0.000	0.000
					C	0.000	165.528		100.00	0.000	0.000

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
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
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

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
3' Side Arm Mount **	C	From Face	0.00 0.00 0.00 0.00 0.00	0.0000	78.00	1/2" Ice No Ice 1/2" Ice	0.60 0.76 0.96	0.60 0.76 0.96	0.01 0.03 0.04

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 180.00-134.00	155.71	1.558	29	84.322	A	0.000	84.322	84.322	100.00	0.000	0.000
					B	0.000	84.322		100.00	0.000	0.000
					C	0.000	84.322		100.00	0.000	0.000
L2 134.00-88.50	110.49	1.412	26	114.529	A	0.000	114.529	114.529	100.00	0.000	0.000
					B	0.000	114.529		100.00	0.000	0.000
					C	0.000	114.529		100.00	0.000	0.000
L3 88.50-43.29	65.61	1.217	22	143.930	A	0.000	143.930	143.930	100.00	0.000	0.000
					B	0.000	143.930		100.00	0.000	0.000
					C	0.000	143.930		100.00	0.000	0.000
L4 43.29-0.00	21.00	1	18	165.528	A	0.000	165.528	165.528	100.00	0.000	0.000
					B	0.000	165.528		100.00	0.000	0.000
					C	0.000	165.528		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 180.00-134.00	155.71	1.558	22	0.5000	88.155	A	0.000	88.155	88.155	100.00	0.000	0.000
						B	0.000	88.155		100.00	0.000	0.000
						C	0.000	88.155		100.00	0.000	0.000
L2 134.00-88.50	110.49	1.412	20	0.5000	118.321	A	0.000	118.321	118.321	100.00	0.000	0.000
						B	0.000	118.321		100.00	0.000	0.000
						C	0.000	118.321		100.00	0.000	0.000
L3 88.50-43.29	65.61	1.217	17	0.5000	147.697	A	0.000	147.697	147.697	100.00	0.000	0.000
						B	0.000	147.697		100.00	0.000	0.000
						C	0.000	147.697		100.00	0.000	0.000
L4 43.29-0.00	21.00	1	14	0.5000	169.135	A	0.000	169.135	169.135	100.00	0.000	0.000
						B	0.000	169.135		100.00	0.000	0.000
						C	0.000	169.135		100.00	0.000	0.000

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
Mount Pipe			0.00 0.00			1/2" Ice	8.57	7.13	0.13
Antel BXA-70063/6CF w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	7.99 8.57	6.29 7.13	0.06 0.13
Antel BXA-70063/6CF w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	7.99 8.57	6.29 7.13	0.06 0.13
Antel BXA-185063/12CF w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.77 5.22	3.73 4.23	0.02 0.05
Antel BXA-185063/12CF w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.77 5.22	3.73 4.23	0.02 0.05
Antel BXA-185063/12CF w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.77 5.22	3.73 4.23	0.02 0.05
(2) Antel LPA-80080/6CF w/mount pipe	A	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.47 4.95	10.93 11.93	0.06 0.12
(2) Antel LPA-80080/6CF w/mount pipe	B	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.47 4.95	10.93 11.93	0.06 0.12
(2) Antel LPA-80080/6CF w/mount pipe	C	From Face	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	4.47 4.95	10.93 11.93	0.06 0.12
12' Low Profile Platform (LP 303-1) ***	C	None		0.0000	170.00	No Ice 1/2" Ice	14.66 18.87	14.66 18.87	1.10 1.70
(2) 7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	0.06 0.10
(2) 7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	0.06 0.10
(2) 7770.00 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	0.06 0.10
(2) LGP21401	A	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0.01 0.02
(2) LGP21401	B	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0.01 0.02
(2) LGP21401	C	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0.01 0.02
(2) Powerwave LGP21901	A	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	0.28 0.36	0.13 0.18	0.01 0.01
(2) Powerwave LGP21901	B	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	0.28 0.36	0.13 0.18	0.01 0.01
(2) Powerwave LGP21901	C	From Face	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice	0.28 0.36	0.13 0.18	0.01 0.01
12' Low Profile Platform (LP 303-1) **	C	None		0.0000	160.00	No Ice 1/2" Ice	14.66 18.87	14.66 18.87	1.10 1.70
Spectracom 8225	C	From Face	3.00	0.0000	79.00	No Ice	0.45	0.45	0.00

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
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.44

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	180.00-134.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.14
L2	134.00-88.50	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.51
L3	88.50-43.29	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.50
L4	43.29-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.44

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.00-134.00	0.0000	0.0000	0.0000	0.0000
L2	134.00-88.50	0.0000	0.0000	0.0000	0.0000
L3	88.50-43.29	0.0000	0.0000	0.0000	0.0000
L4	43.29-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) FV65-14-00NA2 w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice	8.64 9.29	6.95 8.13	0.06 0.12
(2) FV65-14-00NA2 w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice	8.64 9.29	6.95 8.13	0.06 0.12
(2) FV65-14-00NA2 w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice	8.64 9.29	6.95 8.13	0.06 0.12
12' Low Profile Platform (LP 717-1)	C	None		0.0000	180.00	No Ice 1/2" Ice	21.24 23.56	21.24 23.56	1.10 1.70
***									
Antel BXA-70063/6CF w/	A	From Face	4.00	0.0000	170.00	No Ice	7.99	6.29	0.06

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	17.8918	13.7831	525.3925	6.1664	8.9510	58.6968	1051.4762	6.8929	2.6611	10.644
	26.7809	20.7294	1787.3245	9.2740	13.3980	133.4024	3577.0008	10.3667	4.2018	16.807
L2	26.2731	24.7252	1941.0895	8.8494	12.8221	151.3866	3884.7332	12.3650	3.8923	12.455
	35.0657	33.9425	5021.7310	12.1483	17.5428	286.2565	10050.0698	16.9745	5.5278	17.689
L3	34.4311	38.9319	5262.3314	11.6117	16.8067	313.1095	10531.5872	19.4697	5.1628	13.767
	43.1658	50.1512	11248.7596	14.9579	21.5951	520.8946	22512.3206	25.0804	6.8218	18.191
L4	42.4044	48.0694	9905.2687	14.3370	20.7066	478.3638	19823.5709	24.0393	6.5139	17.37
	50.7713	59.0662	18377.1094	17.6169	25.4000	723.5082	36778.3998	29.5387	8.1400	21.707

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 180.00-134.00				1	1	1		
L2 134.00-88.50				1	1	1		
L3 88.50-43.29				1	1	1		
L4 43.29-0.00				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 plf
1-5/8"	C	No	Inside Pole	180.00 - 0.00	6	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
1-5/8"	C	No	Inside Pole	170.00 - 0.00	18	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
1-5/8"	C	No	Inside Pole	160.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
1/2"	C	No	Inside Pole	78.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15

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	180.00-134.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.14
L2	134.00-88.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.51
L3	88.50-43.29	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.50
L4	43.29-0.00	A	0.000	0.000	0.000	0.000	0.00

APPENDIX A

Output From Computer Programs

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 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
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, 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	180.00-134.00	46.00	3.33	18	17.6200	26.3740	0.2500	1.0000	A572-65 (65 ksi)
L2	134.00-88.50	48.83	4.33	18	25.2403	34.5330	0.3125	1.2500	A572-65 (65 ksi)
L3	88.50-43.29	49.53	5.25	18	33.0840	42.5100	0.3750	1.5000	A572-65 (65 ksi)
L4	43.29-0.00	48.54		18	40.7609	50.0000	0.3750	1.5000	A572-65 (65 ksi)

ANALYSIS RESULTS

Our structural analysis indicates that the existing monopole structure and foundation have sufficient capacity to adequately support the existing, reserved, and proposed loading.

Table 4 - Component Stresses vs. Capacity

Notes	Component	Elevation ft	% Capacity	Pass / Fail
Risa Tower Analysis Summary:				
	L1	180 - 134	82.2	Pass
	L2	134 - 88.497	98.6	Pass
	L3	88.497 - 43.294	94.2	Pass
	L4	43.294 - 0	99.6	Pass
Additional Components:				
	Base Plate	0 - 0	79.7	Pass
	Anchor Rods	0 - 0	78.1	Pass
	Foundation (Soil)	0 - 0	76	Pass
	Foundation (Structural)	0 - 0	81	Pass
		Structural Rating (maximum capacity of all components) =		99.6

As summarized in Table 4 above, our analysis indicates that the existing monopole structure and foundation have sufficient capacity to adequately support the existing, reserved, and proposed loading. Modifications are not required at this time.

Information for the existing monopole and foundation is based on the available drawings, documents, and/or information listed in Table 3 below.

Table 3 - Reference Documents Provided

Document	Source	Reference	Remarks
Proposed Antenna Loading	Crown Castle	876375	
Existing Antenna Loading	Crown Castle	876375	
Geotechnical Reports	CCISITES	1615348	Dr. Clarence Welti, 01/24/2000
Foundation Mapping	CCISITES	1615408	FDH, 09-04033E N1, 4/15/2009
Tower Mapping	CCISITES	2428368	FDH, 09-04023T T1, 05/04/2009
Tower Structural Analysis Reports	CCISITES	2431086	CCI, 271546, 05/11/2009
Tower Reinforcement Drawing	CCISITES		PJF, 37509-930, 08/31/2009

ANALYSIS PROCEDURE

ANALYSIS METHODS

RISA Tower (Version 5.3.1.0), a commercially available software program, was used to create a three-dimensional model of the monopole and calculate member stresses for various dead, live, wind, and ice load cases. The analysis was performed in accordance with the TIA/EIA-222-F Standard. Selected output from the analysis is included in Appendix A.

ASSUMPTIONS

1. Monopole was fabricated and installed in accordance with the manufacturer's specifications.
2. Monopole has been properly maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4. Taper lengths were assumed per the minimum design standard per ASCE 48-05
5. Shaft steel assumed to be 65ksi. Base plate assumed to be 50ksi steel.

If any of the above assumptions are not valid or have been made in error, then the results of this analysis may be affected. In that case, please notify Paul J. Ford and Company immediately so that we can review any new and/or modified information and determine its affect on the analysis results regarding the structural adequacy of the monopole and foundation.

INTRODUCTION

At the request of Crown Castle International, Paul J. Ford and Company has analyzed the monopole at the CANTERBURY / LEMIRE site located in CANTERBURY, Windham County, CT. This structural analysis has been performed in accordance with the TIA/EIA-222-F-1996 Standard, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures" to determine if the monopole structure has adequate capacity to support the existing, reserved, and proposed antenna loading.

ANALYSIS CRITERIA

The existing monopole has been analyzed for the antenna and coax loading listed in Tables 1 and 2 below. The monopole has been analyzed in accordance with the TIA/EIA-222-F-1996 Standard for the following fastest-mile Basic Wind Speeds: 85 mph without ice, 74 with 0.5" radial ice, and 50 mph without ice as recommended for Windham County, CT.

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
170*	170	3	Antel	BXA-70063/6CF w/ Mount Pipe	18	1-5/8" (I)	Proposed
		3	Antel	BXA-185063/12CF w/Mount Pipe			
		6	Antel	LPA-80080/6CF w/mount pipe			
		1	-	12' Low Profile Platform (LP 303-1)			

*MLA loading consists of: (12) DB844H90 with (12) 1 5/8" coax, but does not control over the proposed loading and coax.

(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.

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
180	183	6*	EMS	FV65-14-00NA2 w/Mount Pipe	6	1-5/8" (I)	MLA
	180	1	-	12' Low Profile Platform (LP 717-1)			Existing
160	161	6	Powerwave	7770.00 w/ Mount Pipe	12**	1-5/8" (I)	Existing
		6	Powerwave	LGP21401			
		6	Powerwave	LGP21901			
	160	1		12' Low Profile Platform (LP 303-1)			Existing
78	79	1	Spectracom	8225	1	1/2" (I)	Existing
	78	1	-	3' Side Arm Mount			Existing

*MLA loading controls. Existing loading consists of: (6) DB980H90E-M with (6) 1 5/8" coax.
**SLA coax loading controls. Existing coax consists of (12) 1 1/4"

(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.

TABLE OF CONTENTS

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

September 4, 2009

Structure is Adequate
Monopole is Adequate
Foundation is Adequate

Eva Morales
Crown Castle International
46 Broadway
Albany, NY 12204
518-433-6250

Subject: Structural Analysis Report of Existing 180-Ft Monopole

Carrier Designation	**Verizon Wireless Co-Locate**	
	Carrier Site Number:	**118601**
	Carrier Site Name:	**Canterbury CT**
Crown Castle Designation	**Crown Castle BU Number:**	**876375**
	Crown Castle Site Name:	**CANTERBURY / LEMIRE**
	Crown Castle JDE Job Number:	**124367**
	Crown Castle Application Number:	**87690Rev1**
	Crown Castle PO Number:	**344053**
	Crown Castle WO Number:	**292648**
Engineering Firm Designation	**Paul J. Ford and Company**	**37509-0930Rev1**
Site Data	**53 Westminster Rd., CANTERBURY, Windham County, CT** **Latitude 41° 42' 7.1", Longitude -71° 58' 50.1"**	

Dear Eva Morales,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural adequacy of the above monopole. This analysis has been performed in accordance with the Crown Castle Structural "Statement of Work", the terms of the Purchase Order, and the TIA/EIA-222-F Standard for the following Basic Wind Speeds: 85 mph without ice, 74 mph with 0.5" radial ice, and 50 mph (Operational) without ice.

The monopole was analyzed with the addition of the proposed antenna loading shown in the table below combined with the existing and reserved loading on the structure:

Elevation - ft	Count	Antenna Description
170	3	Antel BXA-70063/6CF w/ Mount Pipe
	3	Antel BXA-185063/12CF w/Mount Pipe
	6	Antel LPA-80080/6CF w/mount pipe
	1	12' Low Profile Platform (LP 303-1)

Based on our analysis, we have determined that the existing monopole structure and foundation have sufficient capacity to adequately support the existing, reserved, and proposed loading. Modifications are not required at this time.

Respectfully submitted,

Christina Hedges, EIT
Structural Engineer
chedges@pjfweb.com