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

May 17, 2012

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

Re: **EM-VER-007-120125 – 1684 Chamberlain Highway, Berlin, Connecticut**
EM-VER-014-120110 – 405 Brushy Hill Road, Branford, Connecticut
EM-VER-026-111130 – Wig Hill Road, Chester, Connecticut
EM-VER-070-120202 – 78 Route 81, Killingworth, Connecticut
EM-VER-030-120106 – 330 Middletown Road, Columbia, Connecticut
EM-VER-046-120123 – 206 Everett Road, Easton, Connecticut
EM-VER-049-120214 – Town Farm Road, Enfield, Connecticut
EM-VER-013-111220 – 12 Polly Lane, Bozrah, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify you and the Connecticut Siting Council that construction activity associated with each of the above-referenced modification filings has been completed.

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

Sincerely,

Kenneth C. Baldwin

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

February 10, 2012

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

RE: **EM-VER-046-120123**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 206 Everett Road, Easton, 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 January 19, 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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Thomas A. Herrmann, First Selectman, Town of Easton
Philip Doremus, Planning & Zoning Official, Town of Easton
Thomas J. Regan, Esq., Brown Rudnick LLP (TowerCo Representative)

Martin, David C.

From: Mayo, Rachel [rmayo@RC.com]
Sent: Tuesday, January 31, 2012 9:52 AM
To: Martin, David C.
Cc: Baldwin, Kenneth; Mayo, Rachel
Subject: revised RF tables
Attachments: 20120131094057_00001_00000000_00000001.PDF; ATT00001..txt

Dave, here are the revised tables for those sites that you emailed me about

206 Everett Road, Easton
691 Oxford Road, Oxford
785 Park Avenue, Bloomfield
400 Main Street, Somers
197 North Chestnut Hill Road, Killingworth
Titicus Mountain Road, New Fairfield
125 Mile Creek Road Old Lyme
126 Pioneer Heights Road in Somers.

The RF engineers over at Verizon had to correct a formula in the table...so you should come up with the same numbers now...please let me know if you have any other problems.

Thank you, Rachel

Rachel A. Mayo
Land Use Analyst

Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
Direct 860-275-8213 | Fax 860-275-8299
rmayo@rc.com | www.rc.com
Bio | Contact Card

Boston Providence Hartford New London
Stamford New York Albany White Plains Sarasota

Site Name: EASTON NORTH 2, CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans	ERP Per Trans	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	15	281	4215	128	0.0925	1.0	9.25%
VZW Cellular	869	9	384	3456	128	0.0759	0.579333333	13.09%
VZW AWS	2145	1	702	702	128	0.0154	1.0	1.54%
VZW 700	698	1	636	636	128	0.0140	0.465333333	3.00%

Total Percentage of Maximum Permissible Exposure 26.89%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.

ROBINSON & COLE

EM-VER-046-120123

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

January 19, 2012

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

Re: **Notice of Exempt Modification – Antenna Swap**
206 Everett Road, Easton, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains wireless telecommunications antennas at the 128-foot level on an existing 158-foot tower at the above-referenced address. The tower is owned by TowerCo. Cellco's use of the tower was approved by the Council in 2009. Cellco now intends to replace six (6) of its existing antennas with three (3) model BXA-171063-12BF PCS antennas and three (3) model SCLP 2x6014 LTE antennas, all at the same 128-foot level. Cellco also intends to install six (6) coax cable diplexers on its existing antenna platform. 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 Thomas Hermann, First Selectman of the Town of Easton. A copy of this letter is also being sent to The Barney Family Trust, 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 same 128-foot level on the existing 158-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site 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) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a "Rigorous 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:
Thomas Hermann, Easton First Selectman
The Barney Family Trust
Sandy M. Carter

BXA-171063-12BF-EDIN-X

Replace "X" with desired electrical downtilt.

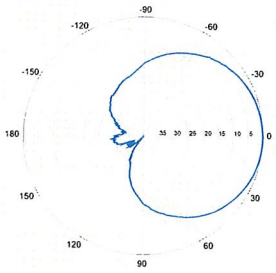
X-Pol | FET Panel | 63° | 19.0 dBi

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	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 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	1820 x 154 x 105 mm	71.7 x 6.1 x 4.1 in
Depth with z-brackets	133 mm	5.2 in
Weight without mounting brackets	6.8 kg	15 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf

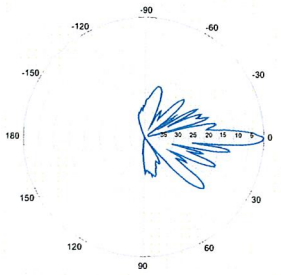
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12BF-EDIN-X-FP		

BXA-171063-12BF-EDIN-X



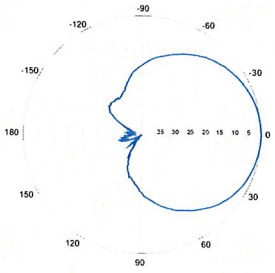
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



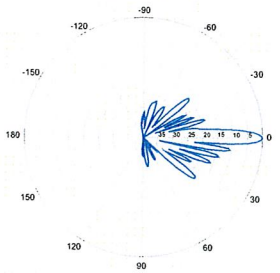
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



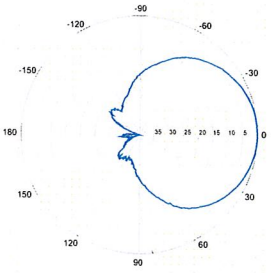
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-0



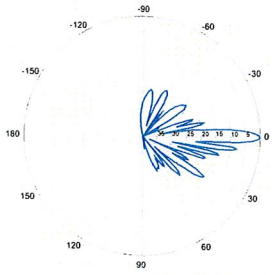
0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0

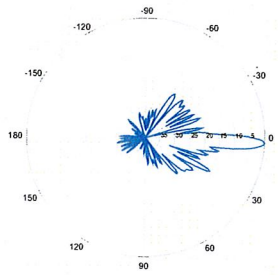


0° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-X

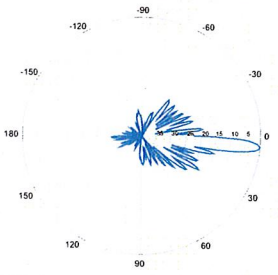
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



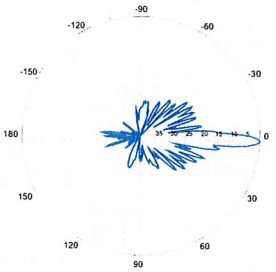
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



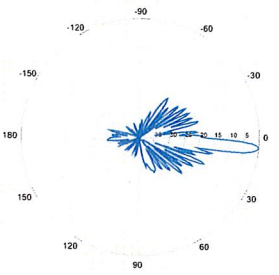
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



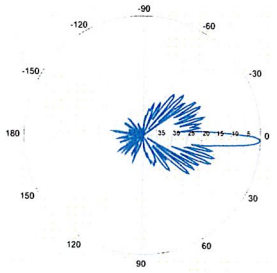
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-5



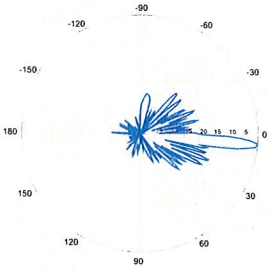
5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5

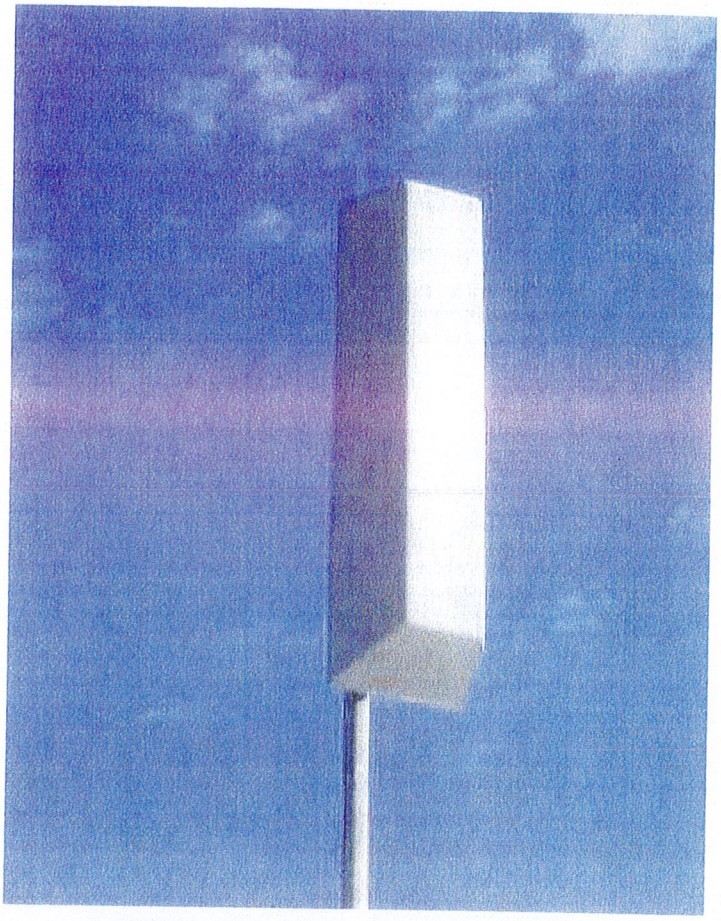


5° | Vertical | 1920-2170 MHz

Swedcom

SLCP 2x6014

Dual (2x) Circularly Polarized log-periodic antenna



Features

- ❑ **Transmit Diversity Gain**
- ❑ **Can be configured to combine space & polarization diversity**
- ❑ **Outstanding performance over the entire band (700 - 800 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:	**700-800 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:	**53 in**	**[1346 mm]**
Width:	**14 in**	**[356 mm]**
Depth:	**11 in**	**[279 mm]**
Weight (excluding brackets):	**20 lbs**	**[9 Kg]**
Wind load measured up to:	**150 mph**	**[240 Km/h]**
Wind area (side of antenna):	**5.15 sq. ft.**	**[0.48 sq.m]**
Lateral thrust at 113 mph/ 180 Km/h (worst case):	**263 lbs**	**[1171 N]**

Materials

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

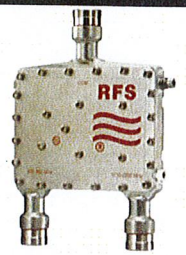
The SLCP 2x6014 is made in the U.S.A.

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
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
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; 60/70@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

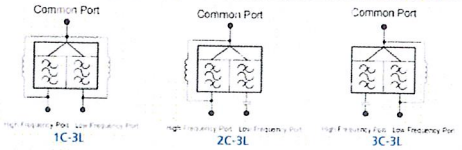
Notes

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

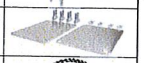
Other Documentation

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)	

	General	Power	Density					
Site Name: Easton N 2								
Tower Height: Verizon @ 128ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	11	201.84	158	0.0320	1962.5	1.0000	3.20%	
*VoiceStream	8	284	138	0.0429	1935	1.0000	4.29%	
*AT&T GSM	6	296	118	0.0459	880	0.5867	7.82%	
*AT&T GSM	3	427	118	0.0331	1900	1.0000	3.31%	
*AT&T UMTS	1	500	118	0.0129	880	0.5867	2.20%	
*AT&T UMTS	1	500	118	0.0129	1900	1.0000	1.29%	
*AT&T LTE	1	500	118	0.0129	740	0.4933	2.62%	
*Nextel	9	100	148	0.0148	851	0.5673	2.60%	
Verizon PCS	**15**	**281**	**128**	**0.0925**	**1970**	**1.0000**	**9.25%**	
Verizon Cellular	**9**	**384**	**128**	**0.0759**	**869**	**0.5793**	**13.10%**	
Verizon AWS	**1**	**702**	**128**	**0.0147**	**2145**	**1.0000**	**1.47%**	
Verizon 700	**2**	**636**	**128**	**0.0140**	**698**	**0.4653**	**3.01%**	
								54.16%
* Source: Siting Council								

TowerCo

PASS
(Shaft, 96% Capacity)

vertical solutions

January 3, 2012

Ms. Catherine Godwin
TowerCo, LLC
5000 Valleystone Drive
Cary, NC 27519
(919) 653-5737

Vertical Solutions, Inc.
PO Box 579
Holly Springs, NC 27540
(888) 321-6167
operations@verticalsolutions-inc.com

Subject	**Rigorous Structural Analysis**
Carrier Designation	**Verizon, Reconfiguration** **Site Number: N/A** **Site Name: Easton North 2 a/k/a Easton**
TowerCo Designation	**Site Number: CT2007** **Site Name: Easton-Everetts Road**
Engineering Firm Designation	**Vertical Solutions Project: 111719, Revision 0**
Site Data	**206 Everett Rd, Easton, Fairfield County, CT 06612** **Latitude: N41° 17' 25.20" ± Longitude: W73° 16' 57.60" ±** **Elevation: 429 ft±, Topography Category: 1;** **Exposure Category: "C"; Structure Class II; Site Class "C"** **158-ft Self Supporting Pole Structure (Monopole)**

Dear Ms. Godwin,

To your request, we present our structural analysis.

Our work indicates that with the proposed appurtenance configuration, the tower and foundation **will** satisfy the structural strength requirements of ANSI/TIA-222-G-2-2009, *Structural Standard for Antenna Supporting Structures and Antennas - Addendum 2* (industry standard) and the *2003 International Building Code* (local building code) for:

- 105-mph three-second gust basic wind speed
- 45-mph three-second gust basic wind speed with 0.75-in radial ice
- Earthquake design parameters and loading, per USGS Ground Motion Parameter Calculator and industry standard, respectively, including:
  - $S_s = 0.277$, $S_1 = 0.065$

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Joshua H. Walton E.I.
Structural Engineer in Training

Produced by: MBA

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED PROFESSIONAL ENGINEER

Michael L. Lassiter, S.E., P.E., C.W.I.
Structural Engineer, Civil Engineer, Certified Weld Inspector
& President
CT License No. 25064

Table 1: Existing, Proposed and Reserved Appurtenance Configuration

Elevation (AGL, ft)	Carrier	Mount	Equipment	Coax	Location[1]
158.58	Sprint/Nextel [Design]	LP Platform	(12) Decibel DB980 PCS[2]	(12) 1 5/8	Inside
	Sprint/Nextel [Existing]		(6) Decibel DB980F90E-M	(6) 1 5/8	Inside
149	Sprint/Nextel	LP Platform	(12) DB844H90E-XY	(12) 1 1/4	Inside
138	T-Mobile	LP Platform	(12) EMS RR90-17-02DP (6) TMAs	(18) 1 1/4	Inside
128[3]	***Verizon***	LP Platform	***(3) Swedcom SLCP 2x6014*** ***(3) Antel BXA-171063/12 BF*** ***(6) RFS Diplexers*** (6) Andrew DB846F65ZAXY	(12) 1 5/8	Outside
118	AT&T	LP Platform	(3) Powerwave P65-16-XLH-RR (6) Powerwave 7770 (6) Powerwave LGP21401 (3) Powerwave TT19-08BP111-001 (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(12) 1 1/4 (1) 3/8 (2) 5/8	Inside
75	Sprint/Nextel	Pipe and Chain	(1) GPS	(1) 1/2	Inside

1. See coax configuration plan, QP-P for coax locations.
2. Decibel DB980 PCS modeled as DB980F90E-M
3. Verizon to remove (6) Antel LPA-185063/8CF and (6) ADC Diplexers

Table 2: Serviceability Requirements: Limit State Deformations[1]

Elevation (AGL, ft)	Equipment	Twist (deg)[2]	Sway (deg)[2]	Deflection (in)	Deflection Limit (in)[3]	Result
158	Structure	0.0002	1.2574	23.905	57	O. K.

1 – See program output for supporting details.
2 – Per TIA-222-G Section 2.8.2.1 rotation about the vertical axis (twist) or any horizontal axis (sway) of the structure shall not exceed 4 degrees.
3 – Per TIA-222-G Section 2.8.2.2 horizontal displacement shall not exceed 3% of the height of the structure.

Table 3: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
158 to 123	46	O.K.	62	O.K.
123 to 79	71	O.K.	-	-
79 to 39	78	O.K.	-	-
39 to 0	**96**	**O.K.**	86	O.K.

Table 4: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized	Result
Soil	22.5' caisson	20' caisson	89	O.K.
Structure	(24) #11= 37.44 in^2	31.4 in^2	84	O.K.

Attachments:

- Project History
- Coax configuration
- Program input and output – wind
- Base plate and anchor rod calculations
- Flange Plate Calcualtions
- Foundation calculations

Project History

VSi Project #: 111719, Revision 0
TowerCo Site Id: CT2007
TowerCo Site Name: Easton-everetts Rd

Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
242281	CT2007	10/15/1999	242281_CT2007 Easton-Everetts Rd Tower and Foundation Design Calculations - 10-15-1999.pdf	Engineered Endeavors Inc.	Nextel	Tower and Foundation Design Calculations
486338	CT2007	3/30/2000	20000330_GEO_CT2007.pdf	Tectonic Engineering & Surveying Consultants	Nextel	Geotechnical Investigation
242318	CT2007	9/25/2002	242318_CT2007 Easton-Everetts Rd T-Mobile Site License Agreement 09-25-02.pdf	Nextel	T-Mobile	Site Lease Agreement
197400	CT2007	11/20/2002	197400_CT2007 Easton-Everetts Rd AWS Site Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
197408	CT2007	11/20/2002	197408_CT2007 Easton-Everetts Rd AWS Site Lease Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
242296	CT2007	11/20/2002	242296_CT2007 Easton-Everetts Rd AWS Site Lease Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
183247	CT2007	12/19/2002	20021219_SAR_CT2007.pdf	Paul J. Ford	PennSummit Tubular	Structural Analysis
242319	CT2007	12/19/2002	20021219_SAR(2)_CT2007.pdf	Paul J. Ford	PennSummit Tubular	Structural Analysis
705214	CT2007	12/19/2002	705214_CT2007 Easton-everetts Rd _PJF_Tower Design Drawing and Calculations_20021219.pdf	Paul J. Ford	PennSummit Tubular	Tower Design Drawings
705215	CT2007	12/19/2002	705215_CT2007 Easton-everetts Rd _PJF_Foundation Drawing and Calculations_20021219.pdf	Paul J. Ford	PennSummit Tubular	Foundation Design Drawings
242290	CT2007	2/12/2003	242290_CT2007 Easton-Everetts Rd AWS Rent Commencement Letter 02-12-03.pdf	Nextel	AT&T	Commencement Notice
840480	CT2007	2/12/2003	840480_CT2007 Easton-everetts Rd AT&T Rent Comm Notice.pdf	Nextel	AT&T	Commencement Notice

Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
242314	CT2007	4/8/2003	242314_CT2007 Easton-Everetts Rd T-Mobile Rent Commencement Letter 04-08-03.pdf	Nextel	T-Mobile	Commencement Notice
183244	CT2007	4/17/2003	183244_CT2007 Easton-Everetts Rd Sprint Site Construction Drawings Nextel Sign Off 04-17-03.pdf	Natcomm, LLC	Sprint	Construction Drawings
183246	CT2007	7/31/2003	183246_CT2007 Easton-Everetts Rd Sprint Site License Agreement 07-31-03.pdf	Nextel	Sprint	Site Lease Agreement
242306	CT2007	7/31/2003	242306_CT2007 Easton-Everetts Rd Sprint MOL 07-31-03.pdf	Nextel	Sprint	Site Lease Agreement
242304	CT2007	9/24/2003	242304_CT2007 Easton-Everetts Rd Sprint Commencement Letter 09-24-03.pdf	Nextel	Sprint	Commencement Notice
242259	CT2007	6/16/2008	242259_CT2007 Easton-Everetts Rd Cingular Tower Loading Form 06-16-08.pdf	Cingular Wireless	Sprint	Tower Loading Form
242261	CT2007	7/9/2008	20080709_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint Sites USA	Structural Analysis
503396	CT2007	9/2/2008	20080902_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis
711882	CT2007	9/23/2008	711882_CT2007 Easton-everetts Rd SLA.pdf	TowerCo	Sprint	Site Lease Agreement
492963	CT2007	10/15/2008	20081015_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis
719727	CT2007	11/1/2008	719727_CT2007 Easton-everetts Rd SiteMaster Inspection Report.pdf	SiteMaster	TowerCo	Tower Inspection Report
505052	CT2007	11/3/2008	505052_CT2007 Easton-Everetts Rd - New Cingular - 1st Amendment.pdf	TowerCo	New Cingular	Amendment SLA
506521	CT2007	11/6/2008	20081106_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis

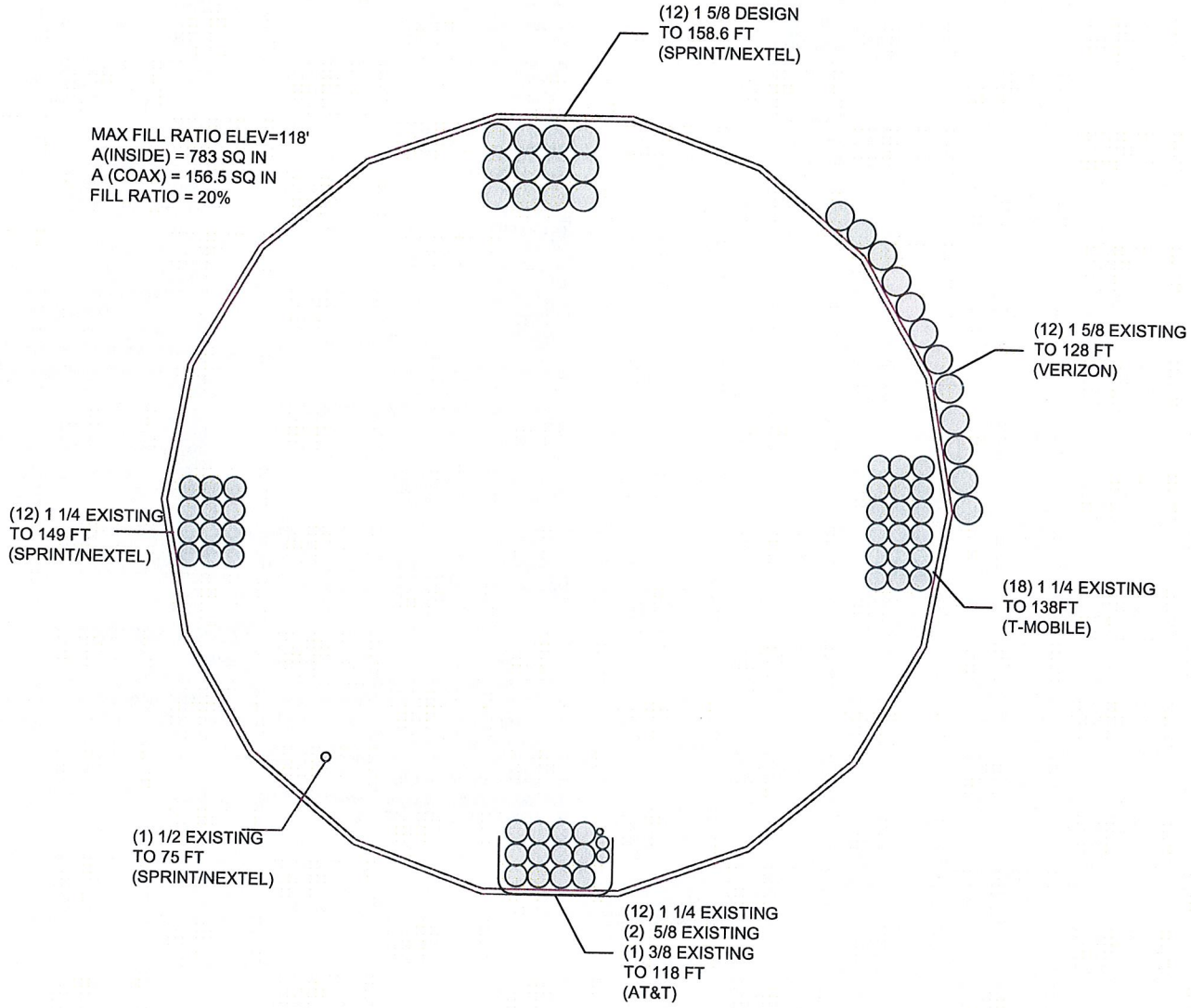
Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
696838	CT2007	3/27/2009	696838_CT2007 Easton-everetts Rd T-Mobile 1st Amd Rent Comm Letter.pdf	TowerCo	T-Mobile	Commencement Notice
714946	CT2007	4/1/2009	714946_CT2007 Easton-everetts Rd Tower Profile.pdf	TowerCo		Tower Profile Drawing
708804	CT2007	4/14/2009	708804_CT2007 Easton-everetts Rd Site Plan.pdf	TowerCo		Site Plan
701718	CT2007	4/20/2009	701718_CT2007 Easton-everetts Rd Verizon SLA Fully Executed.pdf	TowerCo	Verizon	Site Lease Agreement
705681	CT2007	5/7/2009	705681_CT2007 Easton-everetts Rd _Vertical_Structural Analysis_Verizon_Colocation_20090507.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
716947	CT2007	5/18/2009	716947_CT2007 Easton-everetts Rd Verizon Rent Comm Letter.pdf	TowerCo	Verizon	Commencement Notice
840369	CT2007	5/18/2011	840369_CT2007 Easton-everetts Rd _Vertical_Structural Analysis_AT&T_Reconfiguration_20110518.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
843370	CT2007	7/5/2011	843370_CT2007 Easton-everetts Rd 2nd Amendment - New Cingular Wireless.pdf	TowerCo	New Cingular	Amendment SLA
846649	CT2007	8/10/2011	846649_CT2007 Easton-everetts Rd AT&T 2nd Amendment Rent Comm Notice.pdf	TowerCo	New Cingular	Amendment SLA
--	CT2007	12/1/2011	BXA-171063-12BF-EDIN-X.pdf	Amphenol Antel		Antenna/Hardware Information
--	CT2007	12/1/2011	DB846F65ZAXY.pdf	Andrew		Antenna/Hardware Information
--	CT2007	12/12/2011	CT2007 SA Loading(1).xls	TowerCo	Vertical Solutions	SA Loading
--	CT2007	12/12/2011	TowerCo Easton(1).doc	Verizon	TowerCo	Reconfiguration Tenant Application

Table Note:

Files name format YYYYMMDD-XXX-ZZZZZZ.pdf

Where:

YYYYMMDD = Year, Month, Day published/issued
XXX=file describer
ZZZZZZ=TowerCo Site ID



COAX CONFIGURATION PLAN AT 0-FT

SCALE: 1" = 1'–0"

PROJECT INFORMATION:

EASTON-EVERETTS ROAD
CT2007

206 EVERETT RD,
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	1-3-12	TowerCo, LLC.

DRAWN BY:	MBA	CHECKED BY:	JHW

SHEET NUMBER: **QP-P**

REVISION: 0

VSI #: 111719

PLANS PREPARED FOR:

TowerCo

5000 Valleystone Drive
Cary, NC 27519
Office (919) 469-5559
Fax (919) 469-5530

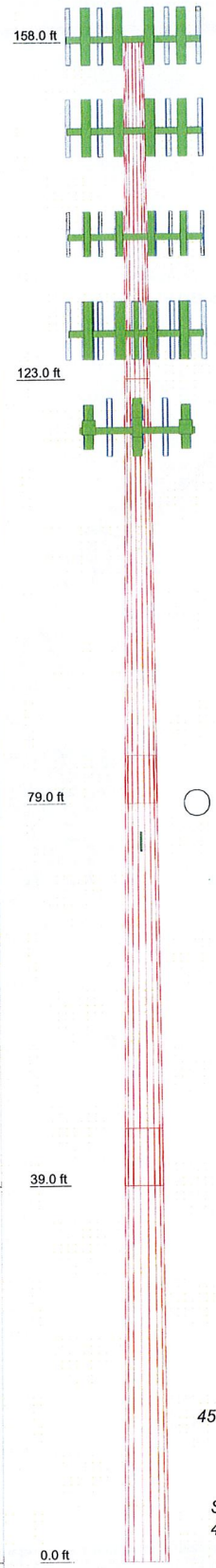
PLANS PREPARED BY:

vertical solutions

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

Section	1	2	3	4
Length (ft)	35.00	44.00	45.00	45.00
Number of Sides	18	18	18	18
Thickness (in)	0.2188	0.3125	0.3750	0.3750
Socket Length (ft)		5.00	6.00	
Top Dia (in)	24.0000	31.1120	38.4120	45.5859
Bot Dia (in)	31.1120	40.0530	47.5550	54.7300
Grade		A572-65		
Weight (K)	2.3	5.2	7.8	9.1

24.3



ALL REACTIONS ARE FACTORED

AXIAL 97 K

SHEAR 8 K

MOMENT 996 kip-ft

TORQUE 1 kip-ft
45 mph WIND - 0.7500 in ICE

AXIAL 50 K

SHEAR 40 K

MOMENT 4529 kip-ft

TORQUE 2 kip-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) DB980F90E-M w/Mount Pipe (Sprint)	158.6	Antel BXA-171063/12 BF w/MP (Verizon)	128
(4) DB980F90E-M w/Mount Pipe (Sprint)	158.6	Antel BXA-171063/12 BF w/MP (Verizon)	128
(4) DB980F90E-M w/Mount Pipe (Sprint)	158.6	(2) Andrew DB846F65ZAXY w/MP (Verizon)	128
PiROD 15' Low Profile Platform (Sprint)	158.6	(2) Andrew DB846F65ZAXY w/MP (Verizon)	128
PiROD 15' Low Profile Platform (Sprint)	149	(2) Andrew DB846F65ZAXY w/MP (Verizon)	128
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	(2) RFS Diplexers (Verizon)	128
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	(2) RFS Diplexers (Verizon)	128
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	(2) RFS Diplexers (Verizon)	128
PiROD 15' Low Profile Platform (TMobile)	138	PiROD 15' Low Profile Platform (ATI)	118
(2) TMA (TMobile)	138	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
(2) TMA (TMobile)	138	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
(2) TMA (TMobile)	138	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
(4) EMS RR90-17-02DP w/MP (TMobile)	138	(2) 7770.00 (ATI)	118
(4) EMS RR90-17-02DP w/MP (TMobile)	138	(2) 7770.00 (ATI)	118
(4) EMS RR90-17-02DP w/MP (TMobile)	138	(2) 7770.00 (ATI)	118
PiROD 15' Low Profile Platform (Verizon)	128	(2) Powerwave LGP21401 (ATI)	118
Swedcom SLCP 2x6014 w/MP (Verizon)	128	(2) Powerwave LGP21401 (ATI)	118
Swedcom SLCP 2x6014 w/MP (Verizon)	128	(2) Powerwave LGP21401 (ATI)	118
Swedcom SLCP 2x6014 w/MP (Verizon)	128	Powerwave TT19-08BP111-001 (ATI)	118
Antel BXA-171063/12 BF w/MP (Verizon)	128	Powerwave TT19-08BP111-001 (ATI)	118
		Powerwave TT19-08BP111-001 (ATI)	118
		(2) Ericsson RRUS-11 (ATI)	118
		(2) Ericsson RRUS-11 (ATI)	118
		(2) Ericsson RRUS-11 (ATI)	118
		Raycap DC6-48-60-18-8F (ATI)	118
		Pipe _Chain (Sprint)	75
		GPS (Sprint)	75

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 45 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 96.1%

TowerCo
5000 Valley Stone Drive
Cary, NC 27519
Phone: (919) 469-5559
FAX: (919) 469-5530

Job: CT2007-ERP			
Project: ENG-11466 (96%)			
Client: TowerCo,LLC	Drawn by: jwalton	App'd:	
Code: TIA-222-G	Date: 01/03/12	Scale: NTS	
Path: L:\2011\1719_Easton-Everetts Rd_CT\Task 1\Models\SAR\tnxTower\CT2007-ERP.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 45 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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	158.00-123.00	35.00	0.00	18	24.0000	31.1120	0.2188	0.8752	A572-65 (65 ksi)
L2	123.00-79.00	44.00	5.00	18	31.1120	40.0530	0.3125	1.2500	A572-65 (65 ksi)
L3	79.00-39.00	45.00	6.00	18	38.4120	47.5550	0.3750	1.5000	A572-65 (65 ksi)

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
L4	39.00-0.00	45.00		18	45.5859	54.7300	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3702	16.5154	1180.0298	8.4423	12.1920	96.7872	2361.6124	8.2592	3.8389	17.545
	31.5920	21.4544	2586.9044	10.9671	15.8049	163.6774	5177.2127	10.7293	5.0906	23.266
L2	31.5920	30.5493	3661.2163	10.9338	15.8049	231.6508	7327.2502	15.2775	4.9257	15.762
	40.6709	39.4176	7864.9212	14.1079	20.3469	386.5410	15740.1912	19.7125	6.4993	20.798
L3	40.0361	45.2735	8275.4882	13.5031	19.5133	424.0951	16561.8654	22.6411	6.1005	16.268
	48.2886	56.1560	15792.4478	16.7489	24.1579	653.7167	31605.6757	28.0833	7.7097	20.559
L4	47.5272	53.8123	13896.5170	16.0499	23.1577	600.0831	27811.3194	26.9113	7.3631	19.635
	55.5743	64.6960	24148.7214	19.2960	27.8028	868.5703	48329.2182	32.3542	8.9725	23.927

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 158.00-123.00				1	1	1		
L2 123.00-79.00				1	1	1		
L3 79.00-39.00				1	1	1		
L4 39.00-0.00				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 klf
LDF7-50A (1-5/8 FOAM) (Sprint)	C	No	Inside Pole	158.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM) (Sprint)	C	No	Inside Pole	149.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM) (TMobile)	C	No	Inside Pole	138.00 - 0.00	18	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	CaAa (Out Of Face)	128.00 - 0.00	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00
						1" Ice	0.40	0.00
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	CaAa (Out Of Face)	128.00 - 0.00	11	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF2-50A (3/8 FOAM)	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
(AT&T)						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF4.5-50 (5/8 FOAM) (AT&T)	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF4-50A (1/2 FOAM) (Sprint)	C	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

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	158.00-123.00	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	0.990	0.78
L2	123.00-79.00	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	8.712	2.06
L3	79.00-39.00	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	7.920	1.92
L4	39.00-0.00	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	7.722	1.87

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	158.00-123.00	A	1.733	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	2.723	1.26
L2	123.00-79.00	A	1.676	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	23.464	6.16
L3	79.00-39.00	A	1.589	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	21.331	5.64
L4	39.00-0.00	A	1.424	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	20.116	5.25

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	158.00-123.00	-0.0397	0.0229	-0.0955	0.0551

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L2	123.00-79.00	-0.2377	0.1372	-0.5372	0.3102
L3	79.00-39.00	-0.2404	0.1388	-0.5588	0.3226
L4	39.00-0.00	-0.2421	0.1398	-0.5584	0.3224

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

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
(4) DB980F90E-M w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	158.60	No Ice 1/2" Ice 1" Ice	4.37 4.96 5.47	3.95 5.04 5.85	0.03 0.07 0.12
(Sprint)									
(4) DB980F90E-M w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	158.60	No Ice 1/2" Ice 1" Ice	4.37 4.96 5.47	3.95 5.04 5.85	0.03 0.07 0.12
(Sprint)									
(4) DB980F90E-M w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	158.60	No Ice 1/2" Ice 1" Ice	4.37 4.96 5.47	3.95 5.04 5.85	0.03 0.07 0.12
(Sprint)									
PiROD 15' Low Profile Platform	C	None		0.0000	158.60	No Ice 1/2" Ice 1" Ice	17.30 22.10 26.90	17.30 22.10 26.90	1.50 2.03 2.56
(Sprint)									
*****									
PiROD 15' Low Profile Platform	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	17.30 22.10 26.90	17.30 22.10 26.90	1.50 2.03 2.56
(Sprint)									
(4) DB844H90E-XY w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.73	5.40 6.49 7.30	0.04 0.08 0.13
(Sprint)									
(4) DB844H90E-XY w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.73	5.40 6.49 7.30	0.04 0.08 0.13
(Sprint)									
(4) DB844H90E-XY w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.73	5.40 6.49 7.30	0.04 0.08 0.13
(Sprint)									
*****									
PiROD 15' Low Profile Platform	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.30 22.10 26.90	17.30 22.10 26.90	1.50 2.03 2.56
(TMobile)									
(2) TMA	A	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.93 1.07 1.21	0.47 0.57 0.69	0.02 0.03 0.03
(TMobile)									
(2) TMA	B	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.93 1.07 1.21	0.47 0.57 0.69	0.02 0.03 0.03
(TMobile)									
(2) TMA	C	From Face	4.00	0.0000	138.00	No Ice	0.93	0.47	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(TMobile)			0.00				1/2" Ice	1.07	0.57	0.03
			0.00				1" Ice	1.21	0.69	0.03
(4) EMS RR90-17-02DP w/MP	A	From Face	4.00	0.0000	138.00		No Ice	4.59	3.34	0.03
(TMobile)			0.00				1/2" Ice	5.09	4.11	0.07
(4) EMS RR90-17-02DP w/MP	B	From Face	0.00				1" Ice	5.58	4.81	0.11
(TMobile)			4.00	0.0000	138.00		No Ice	4.59	3.34	0.03
(4) EMS RR90-17-02DP w/MP	C	From Face	0.00				1/2" Ice	5.09	4.11	0.07
(TMobile)			0.00				1" Ice	5.58	4.81	0.11
*****			4.00	0.0000	138.00		No Ice	4.59	3.34	0.03
PiROD 15' Low Profile Platform	C	None	0.00				1/2" Ice	5.09	4.11	0.07
(Verizon)					0.0000	128.00	1" Ice	5.58	4.81	0.11
Swedcom SLCP 2x6014 w/MP	A	From Face	4.00	0.0000	128.00		No Ice	17.30	17.30	1.50
(Verizon)			0.00				1/2" Ice	22.10	22.10	2.03
Swedcom SLCP 2x6014 w/MP	B	From Face	0.00				1" Ice	26.90	26.90	2.56
(Verizon)			4.00	0.0000	128.00		No Ice	7.45	6.95	0.04
Swedcom SLCP 2x6014 w/MP	C	From Face	0.00				1/2" Ice	7.96	7.76	0.10
(Verizon)			0.00				1" Ice	8.47	8.52	0.18
Antel BXA-171063/12 BF w/MP	A	From Face	4.00	0.0000	128.00		No Ice	7.45	6.95	0.04
(Verizon)			0.00				1/2" Ice	7.96	7.76	0.10
Antel BXA-171063/12 BF w/MP	B	From Face	0.00				1" Ice	8.47	8.52	0.18
(Verizon)			4.00	0.0000	128.00		No Ice	7.45	6.95	0.04
Antel BXA-171063/12 BF w/MP	C	From Face	0.00				1/2" Ice	7.96	7.76	0.10
(Verizon)			0.00				1" Ice	8.47	8.52	0.18
(2) Andrew DB846F65ZAXY w/MP	A	From Face	4.00	0.0000	128.00		No Ice	7.45	6.95	0.04
(Verizon)			0.00				1/2" Ice	7.96	7.76	0.10
(2) Andrew DB846F65ZAXY w/MP	B	From Face	0.00				1" Ice	8.47	8.52	0.18
(Verizon)			2.00	0.0000	128.00		No Ice	4.97	5.23	0.04
(2) Andrew DB846F65ZAXY w/MP	C	From Face	0.00				1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00				1" Ice	6.04	7.26	0.14
(2) RFS Diplexers	A	From Face	2.00	0.0000	128.00		No Ice	4.97	5.23	0.04
(Verizon)			0.00				1/2" Ice	5.52	6.39	0.08
(2) RFS Diplexers	B	From Face	0.00				1" Ice	6.04	7.26	0.14
(Verizon)			2.00	0.0000	128.00		No Ice	7.27	7.82	0.05
(2) RFS Diplexers	C	From Face	0.00				1/2" Ice	7.88	9.01	0.11
(Verizon)			0.00				1" Ice	8.48	9.91	0.19
****			2.00	0.0000	128.00		No Ice	7.27	7.82	0.05
PiROD 15' Low Profile Platform	C	None	0.00				1/2" Ice	7.88	9.01	0.11
(AT&T)					0.0000	118.00	1" Ice	8.48	9.91	0.19
Powerwave P65-16-XLH-RR w/ MP	A	From Face	2.00	0.0000	118.00		No Ice	1.28	0.31	0.02
			0.00				1/2" Ice	1.44	0.41	0.02
			0.00				1" Ice	1.60	0.52	0.03
			2.00	0.0000	128.00		No Ice	1.28	0.31	0.02
			0.00				1/2" Ice	1.44	0.41	0.02
			0.00				1" Ice	1.60	0.52	0.03
			2.00	0.0000	128.00		No Ice	1.28	0.31	0.02
			0.00				1/2" Ice	1.44	0.41	0.02
			0.00				1" Ice	1.60	0.52	0.03
					0.0000	118.00	No Ice	17.30	17.30	1.50
							1/2" Ice	22.10	22.10	2.03
							1" Ice	26.90	26.90	2.56
			2.00	0.0000	118.00		No Ice	8.64	6.36	0.09
			0.00				1/2" Ice	9.29	7.54	0.15

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
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
Powerwave P65-16-XLH-RR	B	From Face	2.00	0.0000	118.00	No Ice	8.64	6.36	0.09
w/ MP			0.00			1/2" Ice	9.29	7.54	0.15
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
Powerwave P65-16-XLH-RR	C	From Face	2.00	0.0000	118.00	No Ice	8.64	6.36	0.09
w/ MP			0.00			1/2" Ice	9.29	7.54	0.15
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
(2) 7770.00	A	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) 7770.00	B	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) 7770.00	C	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) Powerwave LGP21401	A	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
(2) Powerwave LGP21401	B	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
(2) Powerwave LGP21401	C	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
Powerwave	A	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
Powerwave	B	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
Powerwave	C	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
(2) Ericsson RRUS-11	A	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
(2) Ericsson RRUS-11	B	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
(2) Ericsson RRUS-11	C	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
Raycap DC6-48-60-18-8F	C	From Face	2.00	0.0000	118.00	No Ice	1.47	1.47	0.02
(AT&T)			0.00			1/2" Ice	1.67	1.67	0.04
			0.00			1" Ice	1.88	1.88	0.06
****									
Pipe & Chain	C	None		0.0000	75.00	No Ice	2.00	2.00	0.35
(Sprint)						1/2" Ice	3.00	3.00	0.53
						1" Ice	4.00	4.00	0.70
GPS	C	From Face	2.00	0.0000	75.00	No Ice	0.30	0.30	0.00
(Sprint)			0.00			1/2" Ice	0.43	0.43	0.00
			0.00			1" Ice	0.58	0.58	0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	158 - 123	23.905	47	1.2574	0.0002
L2	123 - 79	15.014	47	1.1210	0.0002
L3	84 - 39	7.115	47	0.7819	0.0001
L4	45 - 0	2.100	47	0.4232	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.60	(4) DB980F90E-M w/Mount Pipe	47	23.905	1.2574	0.0002	52276
149.00	PiROD 15' Low Profile Platform	47	21.540	1.2323	0.0002	29042
138.00	PiROD 15' Low Profile Platform	47	18.698	1.1955	0.0002	13068
128.00	PiROD 15' Low Profile Platform	47	16.210	1.1499	0.0002	8712
118.00	PiROD 15' Low Profile Platform	47	13.858	1.0872	0.0002	7345
75.00	Pipe & Chain	47	5.675	0.6972	0.0001	6078

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	158 - 123	131.334	20	6.9200	0.0048
L2	123 - 79	82.523	20	6.1692	0.0045
L3	84 - 39	39.123	20	4.3030	0.0032
L4	45 - 0	11.549	18	2.3286	0.0017

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.60	(4) DB980F90E-M w/Mount Pipe	20	131.334	6.9200	0.0048	9756
149.00	PiROD 15' Low Profile Platform	20	118.351	6.7819	0.0047	5419
138.00	PiROD 15' Low Profile Platform	20	102.751	6.5791	0.0047	2436
128.00	PiROD 15' Low Profile Platform	20	89.088	6.3285	0.0046	1621
118.00	PiROD 15' Low Profile Platform	20	76.174	5.9832	0.0044	1363
75.00	Pipe & Chain	20	31.203	3.8365	0.0028	1115

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	158 - 123 (1)	TP31.112x24x0.2188	35.00	0.00	0.0	21.4544	-10.99	1429.55	0.008
L2	123 - 79 (2)	TP40.053x31.112x0.3125	44.00	0.00	0.0	38.4098	-21.49	2682.95	0.008
L3	79 - 39 (3)	TP47.555x38.412x0.375	45.00	0.00	0.0	54.7050	-33.72	3834.99	0.009
L4	39 - 0 (4)	TP54.73x45.5859x0.375	45.00	0.00	0.0	64.6960	-49.98	4265.60	0.012

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	158 - 123 (1)	TP31.112x24x0.2188	410.86	908.85	0.452	0.00	908.85	0.000
L2	123 - 79 (2)	TP40.053x31.112x0.3125	1490.90	2135.99	0.698	0.00	2135.99	0.000
L3	79 - 39 (3)	TP47.555x38.412x0.375	2798.97	3623.40	0.772	0.00	3623.40	0.000
L4	39 - 0 (4)	TP54.73x45.5859x0.375	4529.11	4772.28	0.949	0.00	4772.28	0.000

Pole Shear Design Data

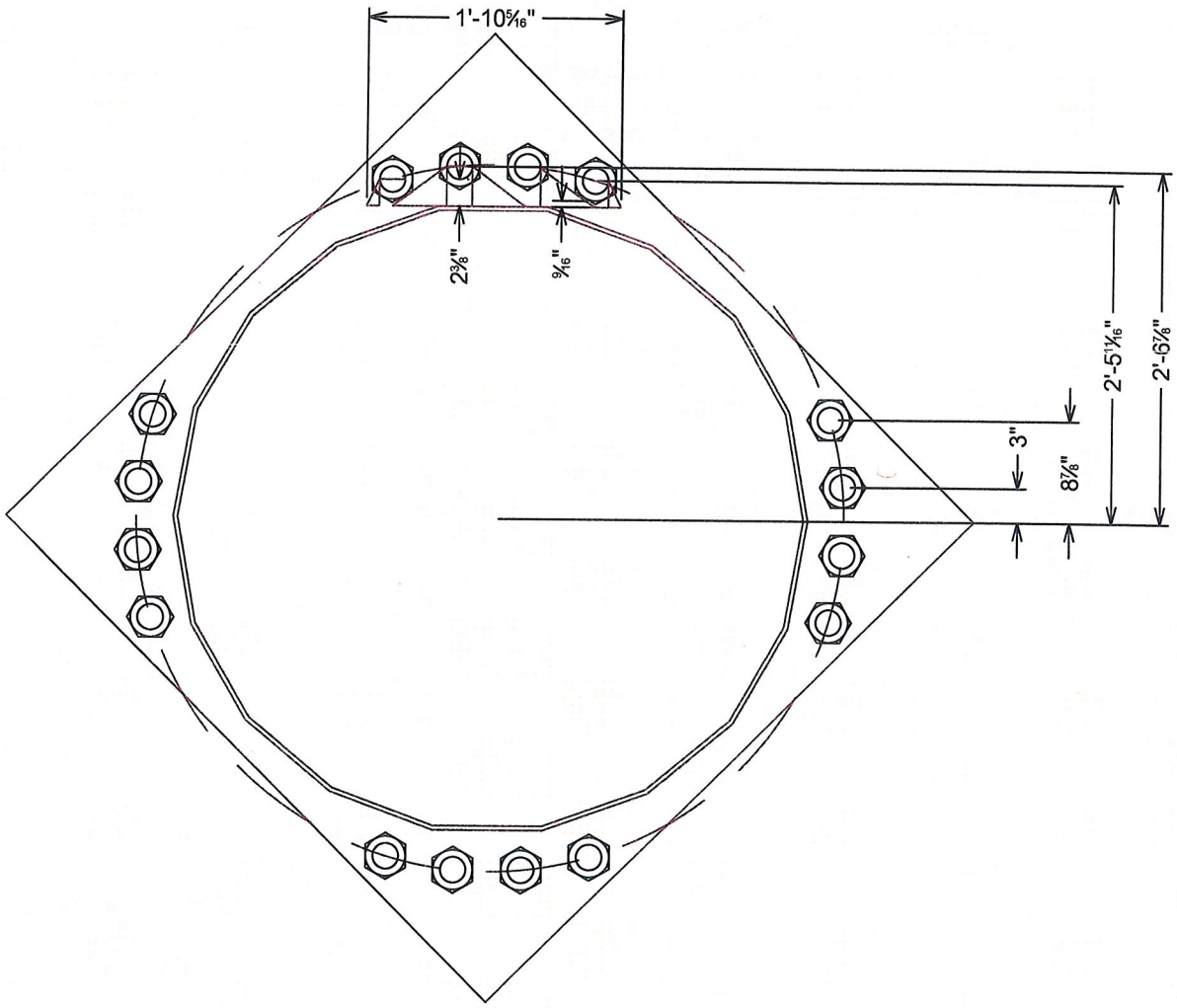
Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	158 - 123 (1)	TP31.112x24x0.2188	21.28	714.78	0.030	0.00	1819.92	0.000
L2	123 - 79 (2)	TP40.053x31.112x0.3125	30.84	1341.47	0.023	0.20	4277.21	0.000
L3	79 - 39 (3)	TP47.555x38.412x0.375	36.02	1917.50	0.019	0.26	7255.67	0.000
L4	39 - 0 (4)	TP54.73x45.5859x0.375	40.49	2132.80	0.019	0.26	9556.25	0.000

Pole Interaction Design Data

Section No.	Elevation	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft								
L1	158 - 123 (1)	0.008	0.452	0.000	0.030	0.000	0.461 ✓	1.000	4.8.2 ✓
L2	123 - 79 (2)	0.008	0.698	0.000	0.023	0.000	0.707 ✓	1.000	4.8.2 ✓
L3	79 - 39 (3)	0.009	0.772	0.000	0.019	0.000	0.782 ✓	1.000	4.8.2 ✓
L4	39 - 0 (4)	0.012	0.949	0.000	0.019	0.000	0.961 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	158 - 123	Pole	TP31.112x24x0.2188	1	-10.99	1429.55	46.1	Pass
L2	123 - 79	Pole	TP40.053x31.112x0.3125	2	-21.49	2682.95	70.7	Pass
L3	79 - 39	Pole	TP47.555x38.412x0.375	3	-33.72	3834.99	78.2	Pass
L4	39 - 0	Pole	TP54.73x45.5859x0.375	4	-49.98	4265.60	96.1	Pass
							Summary	
						Pole (L4)	96.1	Pass
						RATING =	**96.1**	**Pass**



BASE PLATE PLAN

SCALE: 3/4" = 1'-0"

PROJECT INFORMATION:

EASTON-EVERETTS ROAD
CT2007

206 EVERETT RD,
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	12-7-11	TowerCo, LLC.

DRAWN BY: MBA | CHECKED BY: AVF

SHEET NUMBER: **BPL**

REVISION: 0

VSI #: 111645

PLANS PREPARED FOR:

TowerCo

5000 Valleystone Drive
Cary, NC 27519
Office (919) 469-5559
Fax (919) 469-5530

PLANS PREPARED BY:

vertical solutions

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

VSi Job 111645
Date: 12/5/2011
Calculated by: MBA

ANCHOR ROD DESIGN, DEFORMATION METHOD, TIA-222-G

Input -

$M_u := 4529 \cdot kip \cdot ft$ = factored moment reaction at top of base plate

$V_{.ut} := 40 \cdot kip$ = factored shear reaction at top of base plate

$\eta := 0.50$ = coefficient per Figure 4.4

$F_{ub} := 100 \cdot ksi$ = specified minimum tensile stength of bolt

$b_{eff} := 22.31 \cdot in$ = tributary width of base plate

$t := 3.25 \cdot in$ = thickness of flange plate

$F_y := 50 \cdot ksi$ = yield stress of flange plate

$\phi := 0.80$

$$Q := \begin{pmatrix} 4 \\ 4 \\ 4 \\ 4 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \qquad d := \begin{pmatrix} 24 + 6 + \frac{7}{8} \\ 24 + 5 + \frac{11}{16} \\ 8 + \frac{7}{8} \\ 3 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad A := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} in^2 \qquad \phi R_{nt} := \begin{pmatrix} 260 \\ 260 \\ 260 \\ 260 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} kip$$

$$V_{utn} := \frac{V_{ut}}{\eta} \qquad V_{un} := \frac{V_{utn}}{\sum \overrightarrow{(Q)}} \qquad V_u := \begin{pmatrix} V_{un} \\ V_{un} \\ V_{un} \\ V_{un} \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

ϕRnt = nominal tension strength

d = distance from center

A = area of fastener

Q = quantity of fasteners

$$sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A\right)} \qquad sumQAd = 24991 \cdot in^4$$

$$P_u := \frac{M_u \cdot \overrightarrow{(d \cdot A)}}{sumQAd}$$

$$r := \left(\frac{\overrightarrow{P_u + V_u}}{\phi R_{nt}}\right) \qquad \textbf{[section 4.9.9]}$$

CONSTANTS:

$$psi \equiv \frac{lb}{in^2}$$

$$ksi \equiv 1000 \cdot psi$$

$$kip \equiv 1000 \cdot lb$$

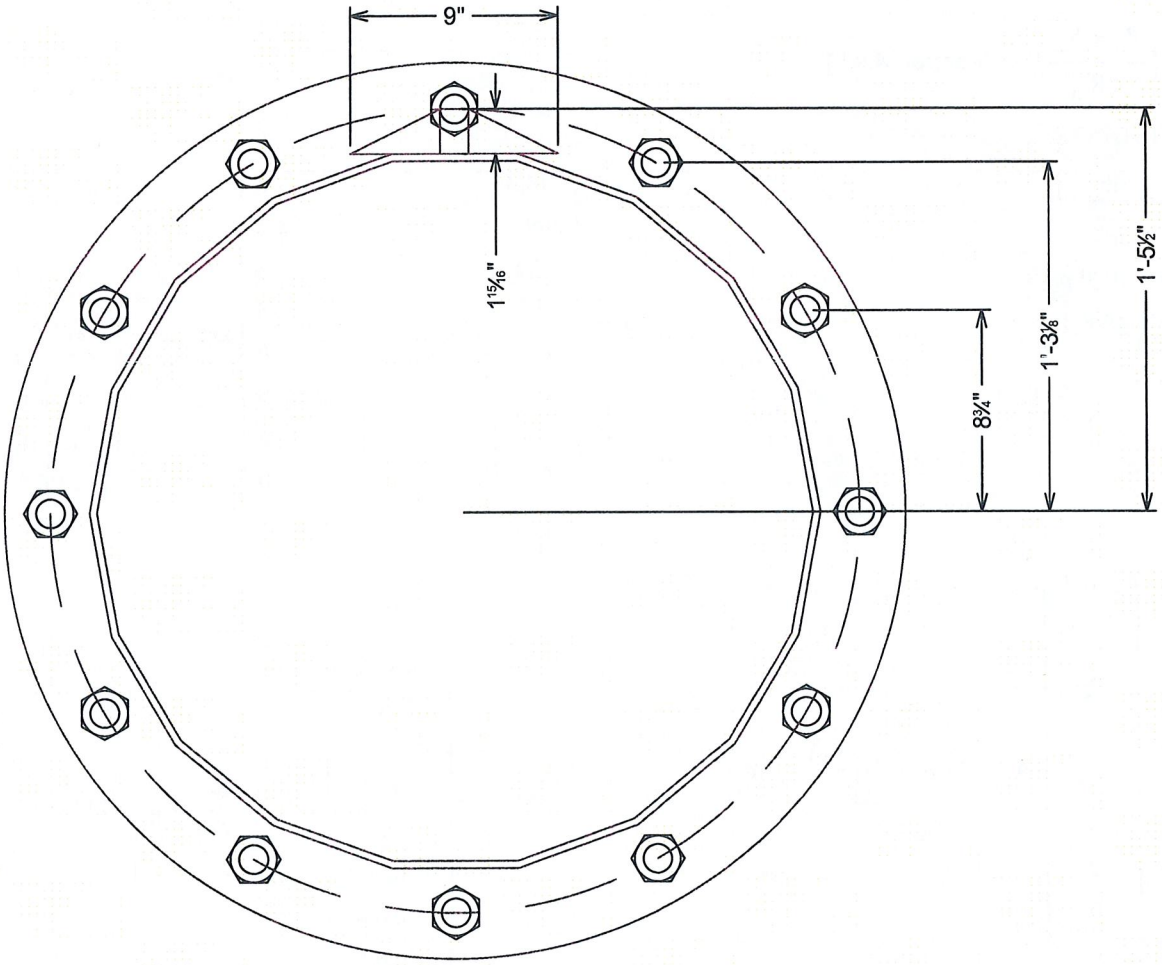
$$P_u = \begin{pmatrix} 218.2 \\ 209.8 \\ 62.7 \\ 21.2 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \qquad V_u = \begin{pmatrix} 5 \\ 5 \\ 5 \\ 5 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot kip \qquad r = \begin{pmatrix} 86 \\ 83 \\ 26 \\ 10 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

$$m := \begin{pmatrix} 2 + \frac{3}{8} \\ \frac{9}{16} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot P_u \cdot m\right]}$$

$$M_{PL} = \begin{pmatrix} 1.0 \times 10^3 \\ 236.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot in \qquad \sum M_{PL} = 1272.6 \cdot kip \cdot in$$

$$\phi M_n := 0.9 \cdot 1.5 \cdot \frac{b_{eff} \cdot t^2}{6} \cdot F_y \qquad \phi M_n = 2.7 \times 10^3 \cdot kip \cdot in$$

$$r_b := \frac{\sum M_{PL}}{\phi M_n} \qquad r_b = 48 \cdot \%$$



FLANGE PLATE AT 123-FT

SCALE: 1 1/2" = 1'-0"

PROJECT INFORMATION:

EASTON-EVERETTS ROAD
CT2007

206 EVERETT RD,
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	12-7-11	TowerCo, LLC.

DRAWN BY: MBA | CHECKED BY: AVF

SHEET NUMBER: **FP**

REVISION: 0

VSI #: 111645

PLANS PREPARED FOR:

TowerCo

5000 Valleystone Drive
Cary, NC 27519
Office (919) 469-5559
Fax (919) 469-5530

PLANS PREPARED BY:

vertical solutions

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

VSi Job No.: 111645
Date: 12/08/11
Calculated by: MBA

FLANGE PLATE DESIGN, DEFORMATION METHOD, TIA-222-G

Input -

$M_u := 411 \cdot kip \cdot ft$ = factored moment reaction at top of base plate

$V_{ut} := 21 \cdot kip$ = factored shear reaction at top of base plate

$\eta := 0.50$ = coefficient per Figure 4.4

$F_{ub} := 105 \cdot ksi$ = specified minimum tensile stength of bolt

$b_{eff} := 9 \cdot in$ = tributary width of base plate

$t := 1.5 \cdot in$ = thickness of flange plate

$F_y := 50 \cdot ksi$ = yield stress of flange plate

$\phi := 0.75$

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 2 \\ 0 \\ 0 \end{pmatrix} \quad d := \begin{pmatrix} 12 + 5 + \frac{1}{2} \\ 12 + 3 + \frac{1}{8} \\ 8 + \frac{3}{4} \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot A_b := \begin{pmatrix} 1.23 \\ 1.23 \\ 1.23 \\ 1.23 \\ 0 \\ 0 \end{pmatrix} in^2 \quad A_n := \begin{pmatrix} 0.969 \\ 0.969 \\ 0.969 \\ 0.969 \\ 0 \\ 0 \end{pmatrix} in^2 \quad V_{utn} := \frac{V_{ut}}{\eta} \quad V_{un} := \frac{V_{utn}}{\sum \overrightarrow{(Q)}} \quad V_u := \begin{pmatrix} V_{un} \\ V_{un} \\ V_{un} \\ V_{un} \\ 0 \\ 0 \end{pmatrix}$$

ϕR_{nt} = nominal tension strength

d = distance from center

A = area of fastener

Q = quantity of fasteners

$$\phi R_{nt} := \phi \cdot F_{ub} \cdot \overrightarrow{(A_n)} \quad \phi R_{nv} := \phi \cdot 0.45 \cdot F_{ub} \cdot \overrightarrow{(A_b)}$$

$$\phi R_{nt} = \begin{pmatrix} 76.3 \\ 76.3 \\ 76.3 \\ 76.3 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \quad \phi R_{nv} = \begin{pmatrix} 43.6 \\ 43.6 \\ 43.6 \\ 43.6 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip$$

$$sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_b\right)} \qquad sumQAd = 2256 \cdot in^4$$

$$P_u := \frac{M_u \cdot \overrightarrow{(d \cdot A_b)}}{sumQAd}$$

$$r := \overrightarrow{\left(\frac{P_u}{\phi R_{nt}}\right)} \quad \text{[section 4.9.6.1]} \qquad r_c := \left[\overrightarrow{\left(\frac{P_u}{\phi R_{nt}}\right)^2 + \left(\frac{V_u}{\phi R_{nv}}\right)^2}\right] \quad \text{[section 4.9.6.4]}$$

$$P_u = \begin{pmatrix} 47.1 \\ 40.7 \\ 23.5 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \qquad V_u = \begin{pmatrix} 3.5 \\ 3.5 \\ 3.5 \\ 3.5 \\ 0 \\ 0 \end{pmatrix} \cdot kip \qquad r = \begin{pmatrix} 62 \\ 53 \\ 31 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \% \qquad r_c = \begin{pmatrix} 39 \\ 29 \\ 10 \\ 1 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

$$m := \begin{pmatrix} 1 + \frac{15}{16} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot P_u \cdot m\right]} \qquad M_{PL} = \begin{pmatrix} 7.6 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot ft \qquad \sum M_{PL} = 91.2 \cdot kip \cdot in$$

$$\phi M_n := 0.9 \cdot 1.5 \cdot \frac{b_{eff} \cdot t^2}{6} \cdot F_y \qquad \phi M_n = 227.8 \cdot kip \cdot in$$

$$r_b := \frac{\sum M_{PL}}{\phi M_n} \qquad r_b = 40 \cdot \%$$

CAISSON Version 4.91 4:49:47 PM Thursday, December 08, 2011
Vertical Solutions Inc.

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*************************************************************************
*                                                                       *
*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*
*                                                                       *
*************************************************************************
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*** ANALYSIS IDENTIFICATION : CT2007
NOTES : 111645, Revision 0

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 7.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	S	4.00	0.00	115.0		1.000	-0.00
2	S	16.00	4.00	125.0		4.204	38.00
3	S	5.00	20.00	62.6		4.204	38.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 4529.0 VERTICAL (k) = 50.0 SHEAR (k) = 40.0
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33

*** CALCULATED PIER LENGTH (ft) = 20.000

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
S	0.50	4.00	115.0		1.000	19.32	3.17
S	4.50	10.24	125.0		4.204	994.77	10.61
S	14.74	5.26	125.0		4.204	-960.34	17.51

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)
0.00	53.7	6195.8	40.4	4658.5
2.00	51.0	6301.9	38.4	4738.3
4.00	39.0	6393.5	29.3	4807.2
6.00	-38.9	6411.6	-29.2	4820.8
8.00	-175.3	6204.8	-131.8	4665.3
10.00	-355.8	5681.0	-267.5	4271.4
12.00	-580.5	4752.0	-436.5	3572.9
14.00	-849.3	3329.5	-638.6	2503.4
16.00	-758.4	1575.6	-570.2	1184.6
18.00	-401.3	408.6	-301.7	307.2
20.00	0.0	-0.0	0.0	-0.0

*** TOTAL REINFORCEMENT PCT = 0.60 REINFORCEMENT AREA (in^2) = 33.25
*** USABLE AXIAL CAP. (k) = 50.0 USABLE MOMENT CAP. (ft-k) = 4974.3

*** US Standard Re-Bars (Select one of the following):

167	BARS #4	(AREA = 0.20 in^2	DIA = 0.500 in)	AT SPACING (in) =	1.39
108	BARS #5	(AREA = 0.31 in^2	DIA = 0.625 in)	AT SPACING (in) =	2.15
76	BARS #6	(AREA = 0.44 in^2	DIA = 0.750 in)	AT SPACING (in) =	3.06
56	BARS #7	(AREA = 0.60 in^2	DIA = 0.875 in)	AT SPACING (in) =	4.15
43	BARS #8	(AREA = 0.79 in^2	DIA = 1.000 in)	AT SPACING (in) =	5.41
34	BARS #9	(AREA = 1.00 in^2	DIA = 1.128 in)	AT SPACING (in) =	6.84
27	BARS #10	(AREA = 1.27 in^2	DIA = 1.270 in)	AT SPACING (in) =	8.61
22	BARS #11	(AREA = 1.56 in^2	DIA = 1.410 in)	AT SPACING (in) =	10.57
15	BARS #14	(AREA = 2.25 in^2	DIA = 1.693 in)	AT SPACING (in) =	15.50

*** WEIGHT OF CAISSON (kips) = 115.454
*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 1299.2

SELF-SUPPORTING POLE STRUCTURE, FILL RATIO TOOL

Fill Ratio

Section Letter	Elevation (ft)	Section #	Group 1 #	Group 1 Nominal Diameter (in)	Group 1 Area (in^2)	Group 2 #	Group 2 Nominal Diameter (in)	Group 2 Area (in^2)	Group 3 #	Group 3 Nominal Diameter (in)	Group 3 Area (in^2)	Group 4 #	Group 4 Nominal Diameter (in)	Group 4 Area (in^2)	Group 5 #	Group 5 Nominal Diameter (in)	Group 5 Area (in^2)	Group 6 #	Group 6 Nominal Diameter (in)	Group 6 Area (in^2)	Group 7 #	Group 7 Nominal Diameter (in)	Group 7 Area (in^2)	Group 8 #	Group 8 Nominal Diameter (in)	Group 8 Area (in^2)	A_{LA} (in2)	FR	Result
G	158.5	1	12	1-5/8	36.95																						36.95	8%	O.K.
F	148	1	12	1-5/8	36.95	12	1-1/4	23.23																			60.18	11%	O.K.
E	138	1	12	1-5/8	36.95	12	1-1/4	23.23	18	1-1/4	34.85																95.03	16%	O.K.
D	128	1	12	1-5/8	36.95	12	1-1/4	23.23	18	1-1/4	34.85	12	1-5/8	36.95													131.98	19%	O.K.
C	118	2	12	1-5/8	36.95	12	1-1/4	23.23	18	1-1/4	34.85	12	1-5/8	36.95	12	1-1/4	23.23	1	3/8	0.15	2	5/8	1.19				156.55	20%	O.K.
B	75	3	12	1-5/8	36.95	12	1-1/4	23.23	18	1-1/4	34.85	12	1-5/8	36.95	12	1-1/4	23.23	1	3/8	0.15	2	5/8	1.19	1	1/2	0.31	156.85	13%	O.K.
A	0	4	12	1-5/8	36.95	12	1-1/4	23.23	18	1-1/4	34.85	12	1-5/8	36.95	12	1-1/4	23.23	1	3/8	0.15	2	5/8	1.19	1	1/2	0.31	156.85	7%	O.K.
Carrier:			Sprint/Nextel						T-Mobile			Verizon			AT&T														