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

June 27, 2012

RECEIVED
JUN 29
CONNECTICUT
SITING COUNCIL

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

Re: **EM-VER-107-111213 – 525 Orange Center Road, Orange, Connecticut**
EM-VER-108-120123 – 691 Oxford Road, Oxford, Connecticut
EM-VER-111-120320 – 171 Town Hill Road, Plymouth, Connecticut
EM-VER-126-120214 – Birdseye Road, Shelton, Connecticut
EM-VER-139-120202B – 44 Fyler Place, Suffield, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

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

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

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter

Law Offices
BOSTON
PROVIDENCE
HARTFORD
NEW LONDON
STAMFORD
WHITE PLAINS
NEW YORK CITY
ALBANY
SARASOTA
www.rc.com

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

March 2, 2012

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

RE: **EM-VER-126-120214** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Birdseye Road, Shelton, 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 February 9, 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,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Mark A. Lauretti, Mayor, City of Shelton
Richard Schultz, Planning Administrator, City of Shelton
Thomas J. Regan, Esq., Brown Rudnick LLP (representative for TowerCo)

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 15, 2012

The Honorable Mark A. Lauretti
Mayor
City of Shelton
54 Hill Street
P. O. Box 364
Shelton, CT 06484

RE: **EM-VER-126-120214** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Birdseye Road, Shelton, Connecticut.

Dear Mayor Lauretti:

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 March 1, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts UHB

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Richard Schultz, Planning Administrator, City of Shelton

CSC
CONNECTICUT SITING COUNCIL

TowerCo

PASS
(Shaft, **98%** capacity)

vertical solutions

February 16, 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: Shelton North**
TowerCo Designation	**Site Number: CT2009** **Site Name: Shelton-North** **JIRA Ticket: ENG-12535**
Engineering Firm Designation	**Vertical Solutions Project: 120148, Revision 01**
Site Data	**162 Birdseye Rd, Shelton, Fairfield County, CT 06484** **Latitude: N41° 19' 32.80"±; Longitude: W73° 8' 55.30"±** **Elevation: 593 ft±, Topography Category: 1;** **Exposure Category: "C"; Structure Class II; Site Class "D"** **118-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 TIA/EIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* (industry standard) and the *2005 Connecticut State Building Code* (local building code) for:

- 85-mph fastest-mile basic wind speed
- 74-mph fastest-mile basic wind speed with 1/2-in radial ice

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

Sincerely,

Avery V. Fann, E.I.
Structural Engineer in Training

Reviewed by: MER

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED
PROFESSIONAL ENGINEER
02/28/2012

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
120[1]	Sprint / Nextel (Existing)	Platform w/ Handrails	(9) Andrew DB844H90E-XY (3) Andrew 932LG65VTE-B	(9) 1 1/4 (6) 1 5/8	Inside
	Sprint / Nextel (Design)	Platform w/ Handrails	(12) Swedcom ALP-9212-N	(12) 1 5/8	Inside
108	AT&T	Low Profile Platform	(3) Kathrein 800-10121 (3) Powerwave P65-16-XLH-RR (6) Powerwave LGP-21401 (3) REC/RETs (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(6) 1 1/4 (1) 1/2 (1) 3/8 (2) 5/8	Inside
91[2]	**Verizon**	Low Profile Platform	**(3) Antel BXA-70063/4CF** **(6) Antel LPA-80063/4CF** **(3) Antel BXA-171063/12BF** **(6) RFS FD9R6004/2C-3L diplexers**	(12) 1 5/8	Inside

1. Design loading was used in the analysis.
2. Verizon to remove (6) Antel LPA-80080/4CF and (6) Antel LPA-185080/8CF

Table 2: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
118 to 77.0	91	O. K.	-	-
77.0 to 40.8	88	O. K.	-	-
40.8 to 0	**98**	**O. K.**	87	O. K.

Table 3: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized[1]	Result
Moment	2040 kip-ft	2000 kip-ft	98	O. K.
Shear	24 kip	23 kip	96	O. K.

1 – Percent utilization based on ratio of analysis reactions to design reactions.

Attachments:

- Project History
- Coax configuration, QP-P
- Program input and output – wind
- Base plate and anchor rod plan and calculations

Project History

VSi Project #: 120148, Revision 01
TowerCo Site Id: CT2009
TowerCo Site Name: Shelton-north

Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
506284	CT2009	6/5/2000	506284_CT2009 Shelton-North Geotechnical Report - 06-05-2000.pdf	Geotechnical Engineering	Diversified Technology Consultants	Geotechnical Investigation
723709	CT2009	7/10/2000	723709_CT2009 Shelton-North Tower and Foundation Design Drawings and Calculations - 07-10-2000.pdf	Paul J. Ford	Summit Manufacturing, LLC	Tower and Foundation Design Calculations
506288	CT2009	8/1/2000	506288_CT2009 Shelton-North CD-s 8-1-00.pdf	Diversified Technology Consultants	Nextel	Construction Drawings
723706	CT2009	11/15/2000	723706_CT2009 Shelton-North Tower and Foundation Design Calculations - 11-15-2000.pdf	Paul J. Ford	Summit Manufacturing, LLC	Tower and Foundation Design Calculations
242461	CT2009	3/5/2002	242461_CT2009 Shelton-North PJF Structural Analysis AT&T CoLo 03-05-2002.pdf	Paul J. Ford	Natcomm, LLC	Structural Analysis Report
197435	CT2009	5/3/2002	197435_CT2009 Shelton-North CT0921T AT&T Site Agreement.pdf	Nextel	AT&T	Site Lease Agreement
242447	CT2009	5/31/2002	242447_CT2009 Shelton-North CT0921 Site Agreement.pdf	Nextel	AT&T	Site Lease Agreement
242460	CT2009	11/19/2002	242460_CT2009 Shelton-North PJF Structural Analysis Verizon CoLo 11-19-2002.pdf	Paul J. Ford	Structure Consulting Group	Structural Analysis Report
242462	CT2009	1/13/2003	242462_CT2009 Shelton-North CT0921T Executed Verizon License Supplement.pdf	Cellco	Nextel	Site Lease Agreement
516756	CT2009	1/13/2003	516756_CT2009 Shelton-north Verizon SLA.pdf	Cellco	Nextel	Site Lease Agreement
242426	CT2009	8/14/2006	242426_CT2009 Shelton-North CT09211 Sprint SLA.pdf	Nextel	Sprint Spectrum	Site Lease Agreement
242429	CT2009	8/7/2007	242429_CT2009 Shelton-North Cingular Feasibility Structural Evaluation 8-7-07.pdf	Malouf Engineering Intl	Hudson Design Group	Structural Analysis Report
197434	CT2009	2/19/2008	197434_CT2009 Shelton-North 02 First Amendment New Cingular SLA.pdf	Nextel	New Cingular	Amendment SLA
242427	CT2009	2/19/2008	242427_CT2009 Shelton-North CT0921 First Amend to New Cingular SLA.pdf	Nextel	New Cingular	Amendment SLA
242436	CT2009	2/19/2008	242436_CT2009 Shelton-North Cingular First Amendment to SLA.pdf	Nextel	New Cingular	Amendment SLA
711884	CT2009	9/23/2008	711884_CT2009 Shelton-north SLA.pdf	TowerCo	Nextel	Site Lease Agreement
714948	CT2009	11/2/2008	714948_CT2009 Shelton-north Tower Profile.pdf	SiteMaster	TowerCo	Tower Profile Drawing

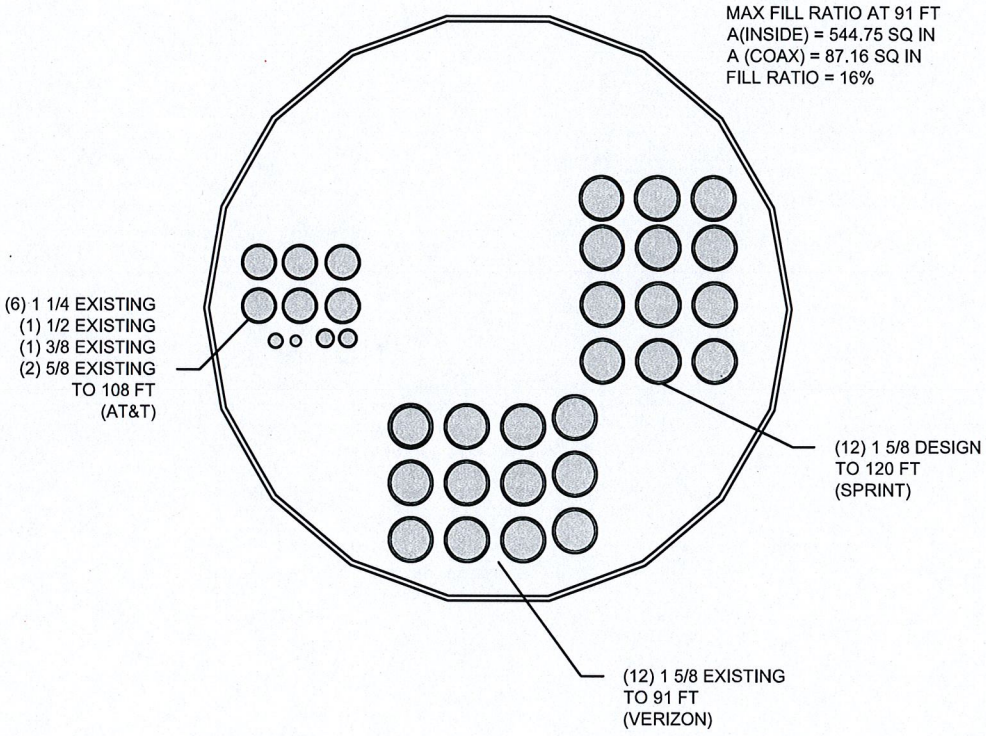
Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
719729	CT2009	11/2/2008	719729_CT2009 Shelton-north SiteMaster Inspection Report.pdf	SiteMaster	TowerCo	Tower Inspection Report
826220	CT2009	3/4/2011	826220_CT2009 Shelton-north _Vertical_Structural Analysis_T-Mobile_Colocation_20110304.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
708806	CT2009	3/21/2011	708806_CT2009 Shelton-north Site Plan.pdf	TowerCo		Site Plan
840071	CT2009	5/16/2011	840071_CT2009 Shelton-north _Vertical_Structural Analysis_AT&T_Reconfiguration_20110516.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
843371	CT2009	7/5/2011	843371_CT2009 Shelton-north 2nd Amendment - New Cingular Wireless.pdf	TowerCo	New Cingular	Amendment SLA
846653	CT2009	8/10/2011	846653_CT2009 Shelton-north AT&T 2nd Amendment Rent Comm Notice.pdf	TowerCo	New Cingular	Amendment SLA
--	CT2009	12/15/2011	TowerCo Shelton North.doc	Verizon	TowerCo	Reconfiguration Tenant Application
859678	CT2009	1/6/2012	859678_CT2009 Shelton-north _Vertical_Structural Analysis_Verizon_Reconfiguration_20120106.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
860825	CT2009	1/26/2012	860825_CT2009 Shelton-north Verizon 1st Amendment to SLA Fully Executed.pdf	TowerCo	Cellco	Amendment SLA
860878	CT2009	1/27/2012	860878_CT2009 Shelton-north Verizon 1st Amendment Rent Commencement Notice.pdf	TowerCo	Verizon	Commencement Notice
--	CT2009	1/30/2012	CT2009 SA Loading.xls	TowerCo	Vertical Solutions	SA Loading
--	CT2009	1/30/2012	TowerCo Shelton North. [1]doc.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 - 91 FT

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

PROJECT INFORMATION:

Shelton-North
SITE #: CT2009

162 Birdseye Rd
Shelton, CT 06484
(Fairfield County)

REV	DATE:	Issued For:
01	02-16-12	TowerCo, LLC.
0	02-05-12	TowerCo, LLC.

DRAWN BY: AVF | CHECKED BY: MER

SHEET NUMBER: **QP-P**

REVISION: 01

VSI #: 120148

PLANS PREPARED FOR:
TowerCo
5000 Valleystone Drive
Cary, NC 27519
Office (919) 469-5559
Fax (919) 469-5530

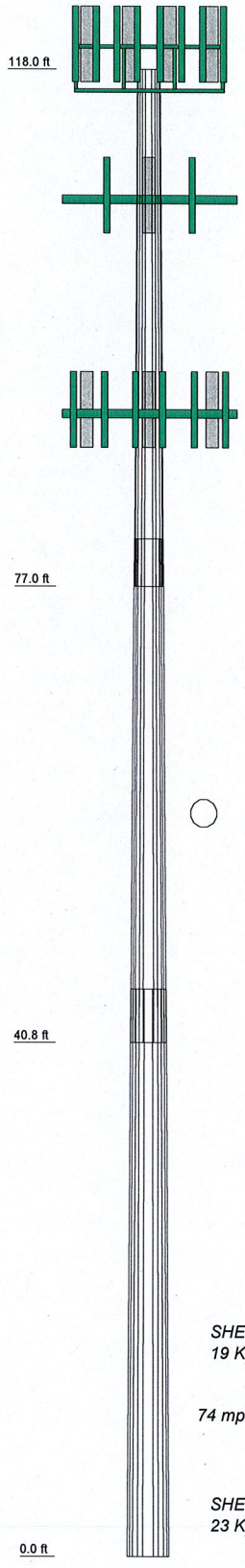
PLANS PREPARED BY:
vertical solutions
2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

SELF-SUPPORTING POLE STRUCTURE, FILL RATIO TOOL

Fill Ratio

			Group 1			Group 2			Group 3			Group 4			Group 5			Group 6			A_{LA}	FR	Result
Section Letter	Elevation (ft)	Section #	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	(in2)		
D	118	1	12	1-5/8	36.95																36.95	10%	O.K.
C	108	1	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19				50.21	12%	O.K.
B	91	1	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19	12	1-5/8	36.95	87.16	16%	O.K.
A	0	3	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19	12	1-5/8	36.95	87.16	7%	O.K.
Carrier:			Sprint / Nextel - Design			AT&T - Existing												Verizon - Existing			Max =	16%	O.K.

Section	1	2	3
Length (ft)	41.00	40.00	45.00
Number of Sides	12	12	12
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)	3.75	4.25	
Top Dia (in)	22.0000	27.7713	33.0448
Bot Dia (in)	28.7650	34.3710	40.4700
Grade		A572-65	
Weight (K)	2.1	4.2	6.7



AXIAL
28 K
SHEAR
19 K
MOMENT
1697 kip-ft
TORQUE 0 kip-ft
74 mph WIND - 0.5000 in ICE

AXIAL
22 K
SHEAR
23 K
MOMENT
2000 kip-ft
TORQUE 0 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
PiROD 13' Platform w/handrail (Sprint)	118	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	PiROD 13' Low Profile Platform (Verizon)	91
REC/RETs (ATI)	108		
REC/RETs (ATI)	108		
REC/RETs (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
Raycap DC6-48-60-18-8F (ATI)	108		
PiROD 13' Low Profile Platform (ATI)	108		

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 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 60 mph wind.
5. TOWER RATING: 98.3%

"Execute and Deliver"

Vertical Solutions, Inc.
2002 Production Drive
Apex, NC 27539
Phone: (888) 321-6167
FAX: (919) 321-1768

Job: *CT2009-ERP*			
Project: *ENG-12535 (98%)*			
Client: TowerCo, LLC.	Drawn by: afann		App'd:
Code: TIA/EIA-222-F	Date: 02/05/12		Scale: NTS
Path: L:\2012\0148_Shelton-North_CT\Task 1\Models\SAR\tnxTower\CT2009-ERP.er			Dwg No. E-1

tnxTower	Job	Page
	CT2009-ERP	1 of 6
Vertical Solutions, Inc. 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 321-1768	**Project** ENG-12535 (98%)	**Date** 11:54:28 02/05/12
	Client TowerCo, LLC.	**Designed by** afann

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 Fairfield 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.
Temperature drop of 50 °F.
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 1.333.
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*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	118.00-77.00	41.00	3.75	12	22.0000	28.7650	0.1875	0.7500	A572-65 (65 ksi)
L2	77.00-40.75	40.00	4.25	12	27.7713	34.3710	0.3125	1.2500	A572-65 (65 ksi)
L3	40.75-0.00	45.00		12	33.0448	40.4700	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	13.1693	799.7595	7.8089	11.3960	70.1790	1620.5296	6.4815	5.3935	28.765
	29.7797	17.2537	1798.5222	10.2307	14.9003	120.7040	3644.2935	8.4917	7.2065	38.435
L2	29.3915	27.6304	2659.0967	9.8302	14.3855	184.8455	5388.0509	13.5988	6.6052	21.137
	35.5835	34.2714	5074.2095	12.1929	17.8042	285.0011	10281.7241	16.8673	8.3739	26.797
L3	34.9365	39.4488	5374.1723	11.6958	17.1172	313.9634	10889.5300	19.4155	7.8510	20.936
	41.8976	48.4147	9934.4480	14.3540	20.9635	473.8935	20129.8851	23.8282	9.8410	26.243

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 118.00-77.00				1	1	1		
L2 77.00-40.75				1	1	1		
L3 40.75-0.00				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
LDF7-50A (1-5/8 FOAM) (Sprint) ****	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
LDF4P-50A (1/2 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF2-50A (3/8 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
LDF4.5-50 (5/8 FOAM) (AT&T) ***	C	No	Inside Pole	108.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM) (Verizon) ***	C	No	Inside Pole	91.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

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	118.00-77.00	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	0.68
L2	77.00-40.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	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
		C	0.000	0.000	0.000	0.000	0.88
L3	40.75-0.00	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	0.000	0.98

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	118.00-77.00	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	0.68
L2	77.00-40.75	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	0.88
L3	40.75-0.00	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	0.98

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
***									
(4) ALP 9212-N w/Mount Pipe (Sprint)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(4) ALP 9212-N w/Mount Pipe (Sprint)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(4) ALP 9212-N w/Mount Pipe (Sprint)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
PiROD 13' Platform w/handrail (Sprint)	C	None		0.0000	118.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
***									
Kathrein 800 10121 (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Kathrein 800 10121 (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Kathrein 800 10121 (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Powerwave P65-16-XLH-RR w/ MP	A	From Leg	3.00 0.00	0.0000	108.00	No Ice 1/2" Ice	8.64 9.29	6.36 7.54	0.09 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: Lateral ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)				0.00							
Powerwave P65-16-XLH-RR	B	From Leg	3.00			0.0000	108.00	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							
Powerwave P65-16-XLH-RR	C	From Leg	3.00			0.0000	108.00	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							
(2) Powerwave LGP21401	A	From Leg	3.00			0.0000	108.00	No Ice	0.00	0.37	0.02
(AT&T)			0.00					1/2" Ice	0.00	0.48	0.03
				0.00							
(2) Powerwave LGP21401	B	From Leg	3.00			0.0000	108.00	No Ice	0.00	0.37	0.02
(AT&T)			0.00					1/2" Ice	0.00	0.48	0.03
				0.00							
(2) Powerwave LGP21401	C	From Leg	3.00			0.0000	108.00	No Ice	1.43	0.37	0.02
(AT&T)			0.00					1/2" Ice	1.59	0.48	0.03
				0.00							
REC/RETs	A	From Leg	3.00			0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00					1/2" Ice	0.00	0.81	0.02
				0.00							
REC/RETs	B	From Leg	3.00			0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00					1/2" Ice	0.00	0.81	0.02
				0.00							
REC/RETs	C	From Leg	3.00			0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00					1/2" Ice	0.00	0.81	0.02
				0.00							
(2) Ericsson RRUS-11	A	From Leg	3.00			0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00					1/2" Ice	3.17	1.77	0.08
				0.00							
(2) Ericsson RRUS-11	B	From Leg	3.00			0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00					1/2" Ice	3.17	1.77	0.08
				0.00							
(2) Ericsson RRUS-11	C	From Leg	3.00			0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00					1/2" Ice	3.17	1.77	0.08
				0.00							
Raycap DC6-48-60-18-8F	C	From Leg	3.00			0.0000	108.00	No Ice	0.00	1.20	0.05
(AT&T)			0.00					1/2" Ice	0.00	1.38	0.06
				0.00							
PiROD 13' Low Profile	A	None				0.0000	108.00	No Ice	15.70	15.70	1.30
Platform								1/2" Ice	20.10	20.10	1.76
(AT&T)											
***											
Antel BXA-70063/4CFw/	A	From Leg	3.00			0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00					1/2" Ice	5.86	4.32	0.07
(Verizon)				0.00							
Antel BXA-70063/4CFw/	B	From Leg	3.00			0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00					1/2" Ice	5.86	4.32	0.07
(Verizon)				0.00							
Antel BXA-70063/4CFw/	C	From Leg	3.00			0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00					1/2" Ice	5.86	4.32	0.07
(Verizon)				0.00							
(2) Antel LPA-80063/4CF w	A	From Leg	3.00			0.0000	91.00	No Ice	7.26	7.27	0.04
MP			0.00					1/2" Ice	7.73	7.98	0.10
(Verizon)				0.00							
(2) Antel LPA-80063/4CF w	B	From Leg	3.00			0.0000	91.00	No Ice	7.26	7.27	0.04
MP			0.00					1/2" Ice	7.73	7.98	0.10
(Verizon)				0.00							
(2) Antel LPA-80063/4CF w	C	From Leg	3.00			0.0000	91.00	No Ice	7.26	7.27	0.04

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
MP			0.00			1/2" Ice	7.73	7.98	0.10
(Verizon)			0.00						
Antel BXA-171063/12 BF	A	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
Antel BXA-171063/12 BF	B	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
Antel BXA-171063/12 BF	C	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
(2) RFS FD9R6004/2C-3L	A	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
(2) RFS FD9R6004/2C-3L	B	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
(2) RFS FD9R6004/2C-3L	C	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
PiROD 13' Low Profile	C	None		0.0000	91.00	No Ice	15.70	15.70	1.30
Platform						1/2" Ice	20.10	20.10	1.76
(Verizon)									

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	118 - 77 (1)	TP28.765x22x0.1875	41.00	0.00	0.0	34.465	16.8801	-7.60	581.78	0.013
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	40.00	0.00	0.0	39.000	33.5658	-12.74	1309.06	0.010
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	45.00	0.00	0.0	39.000	48.4147	-21.86	1888.17	0.012

Pole Bending Design Data

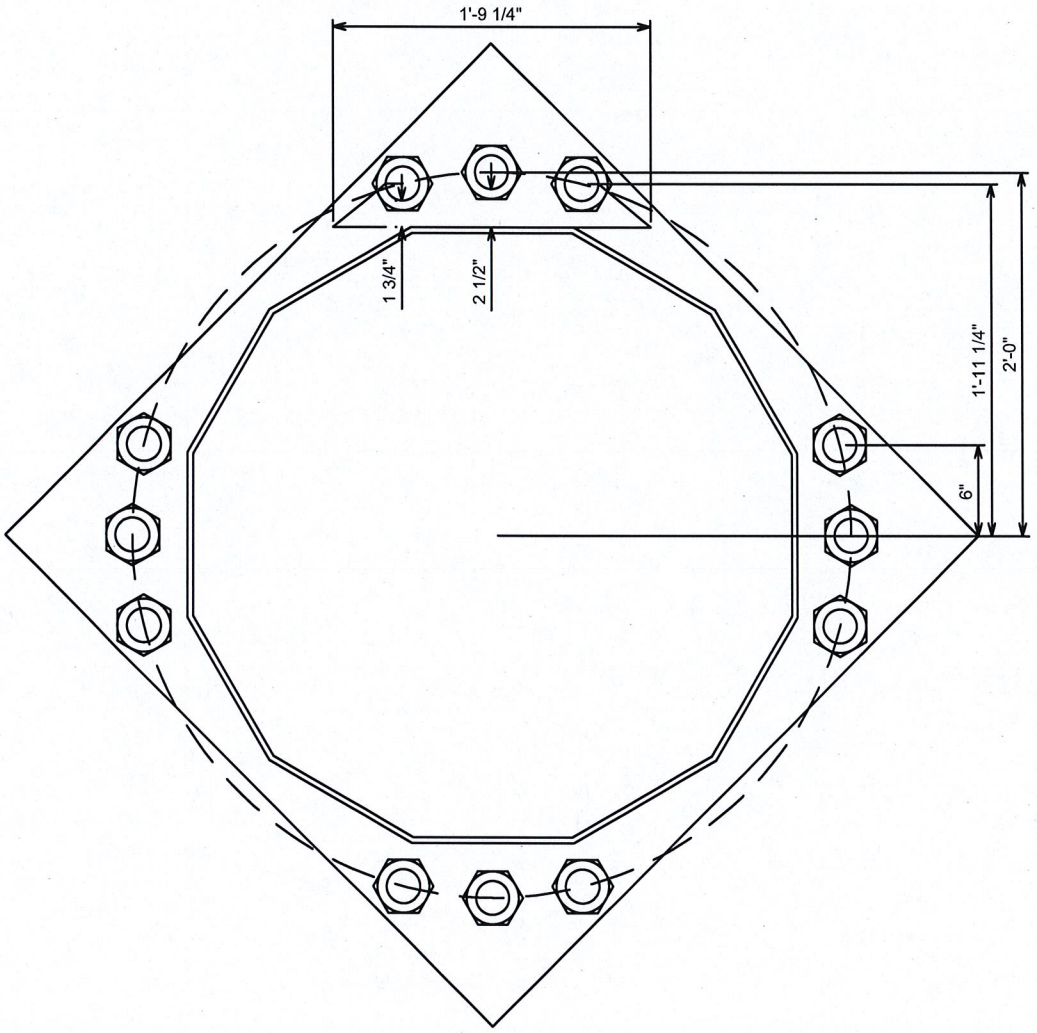
Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	118 - 77 (1)	TP28.765x22x0.1875	400.10	-41.562	34.465	1.206	0.00	0.000	34.465	0.000
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	1034.96	-45.437	39.000	1.165	0.00	0.000	39.000	0.000
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	2000.27	-50.651	39.000	1.299	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	118 - 77 (1)	TP28.765x22x0.1875	0.013	1.206	0.000	1.219 ✔	1.333	H1-3 ✔
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	0.010	1.165	0.000	1.175 ✔	1.333	H1-3 ✔
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	0.012	1.299	0.000	1.310 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	118 - 77	Pole	TP28.765x22x0.1875	1	-7.60	775.51	91.4	Pass
L2	77 - 40.75	Pole	TP34.371x27.7713x0.3125	2	-12.74	1744.98	88.1	Pass
L3	40.75 - 0	Pole	TP40.47x33.0448x0.375	3	-21.86	2516.93	98.3	Pass
							Summary	
						Pole (L3)	98.3	Pass
						RATING =	**98.3**	**Pass**



BASE PLATE LAYOUT

SCALE: 1" = 1'-0"

PROJECT INFORMATION:

Shelton-North
SITE #: CT2009

162 Birdseye Rd
Shelton, CT 06484
(Fairfield County)

01	02-16-12	TowerCo, LLC.
0	02-05-12	TowerCo, LLC.
REV	DATE:	Issued For:

DRAWN BY: AVF | CHECKED BY: MER

SHEET NUMBER: **BP**

REVISION: 01

VSI #: 120148

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.: 120148
Date: 02/05/2012
Calculated by: AVF

BASE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input -

$M := 2000 \cdot kip \cdot ft$ = moment at top of flange plate

$P := 22 \cdot kip$ = axial load (use zero if base plate is grouted)

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

$b_{eff} := 21.25 \cdot in$ = effective width of base plate in flexure

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

$ASI := 133 \cdot \%$ = allowable stress increase

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 2 \\ 0 \end{pmatrix} \qquad d := \begin{pmatrix} 24 \\ 23.25 \\ 6 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad A_{stiff} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 0 \end{pmatrix} in^2 \qquad A_{stress} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 0 \end{pmatrix} in^2 \qquad F_t := \begin{pmatrix} 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0 \end{pmatrix} \cdot ksi$$

$$\sum \overrightarrow{(Q)} = 12 \qquad sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_{stiff}\right)}$$

$sumQAd = 13764 \cdot in^4$

$$R := \frac{M \cdot \overrightarrow{\left(d \cdot A_{stiff}\right)}}{sumQAd} + \frac{P \cdot A_{stiff}}{\sum \overrightarrow{\left(A_{stiff} \cdot Q\right)}}$$

Anchor Rods =

$$f_t := \overrightarrow{\left(\frac{R}{A_{stress}}\right)} \qquad r := \overrightarrow{\left(\frac{f_t}{ASI \cdot F_t}\right)}$$

$$R = \begin{pmatrix} 168.4 \\ 163.2 \\ 43.5 \\ 1.8 \\ 0.0 \end{pmatrix} \cdot kip \qquad f_t = \begin{pmatrix} 51.8 \\ 50.2 \\ 13.4 \\ 0.6 \\ 0.0 \end{pmatrix} \cdot ksi \qquad r = \begin{pmatrix} 87 \\ 84 \\ 22 \\ 1 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress

$$m := \begin{pmatrix} 2.5 \\ 1.75 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot R \cdot m\right]} \qquad M_{PL} = \begin{pmatrix} 35.1 \\ 47.6 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot ft \qquad \sum M_{PL} = 992.1 \cdot kip \cdot in$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6}\right)} \qquad f_b = 26.5 \cdot ksi$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

Base Plate =

$r_b = 53 \cdot \%$

EM-VER-126-120214

ROBINSON & COL

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

February 9, 20121

RECEIVED
FEB 14 2012
CONNECTICUT
SITING COUNCIL

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

Re: **Notice of Exempt Modification – Antenna Swap**
Birdseye Road, Shelton, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 91-foot level on the existing 118-foot tower at the above-referenced address. The tower is owned by TowerCo, LLC. The Council approved Cellco's use of the tower in 2007. Cellco now intends to modify its installation by replacing all of its existing antennas with six (6) model LPA-80063-4CF cellular antennas; three (3) model BXA-171063-12BF PCS antennas; and three (3) model BXA-70063-4CF LTE antennas, all at the same 91-foot level on the tower. Cellco also intends to install six (6) coax cable diplexers on its 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 Mark A. Lauretti, Mayor of the City of Shelton. A copy of this letter is also being sent to Rudolph and Roberta G. Hudak, the owners 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 overall height of the existing tower. Cellco's replacement antennas and diplexers will be located at the 91-foot level on the existing 118-foot tower.

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WHITE PLAINS
NEW YORK CITY
ALBANY
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www.rc.com

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 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:
Mark A. Lauretti, Shelton Mayor
Rudolph and Roberta G. Hudak
Sandy M. Carter

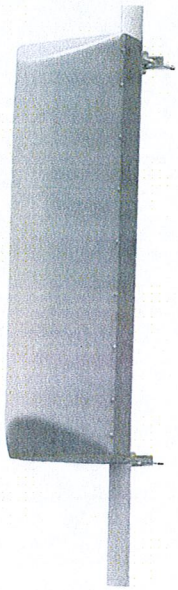
Amphenol ANTENNA SOLUTIONS

LPA-80063-4CF-EDIN-X

V-Pol | Log Periodic | 63° | 13.0 dBd

Replace "X" with desired electrical downtilt.

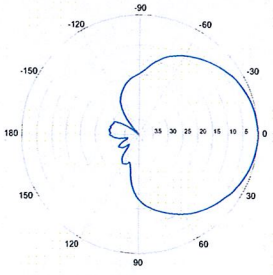
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.



Electrical Characteristics		
Frequency bands	806-960 MHz	
Polarization	Vertical	
Horizontal beamwidth	63°	
Vertical beamwidth	15°	
Gain	13.0 dBd (15.1 dBi)	
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.4:1	
Upper sidelobe suppression (0°)	-15.7 dB	
Front-to-back ratio (+/-30°)	-31.7 dB	
Null fill	5% (-26.02 dB)	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 385 x 332 mm	47.4 x 15.2 x 13.1 in
Depth of antenna with z-bracket	372 mm	14.6 in
Weight without mounting brackets	9.1 kg	20 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.46 m² Side: 0.39 m²	Front: 5.0 ft² Side: 4.2 ft²
Wind load @ 161 km/hr (100 mph)	Front: 660 N Side: 550 N	Front: 149 lbf Side: 124 lbf

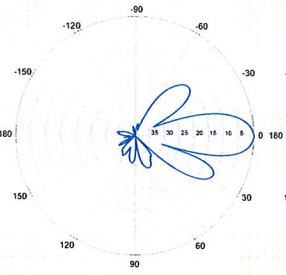
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm 2.0-4.0 in	5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80063-4CF-EDIN-X



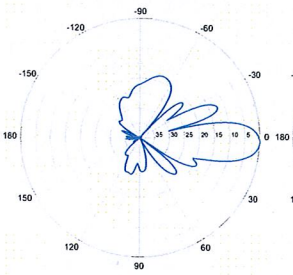
Horizontal

LPA-80063-4CF-EDIN-0



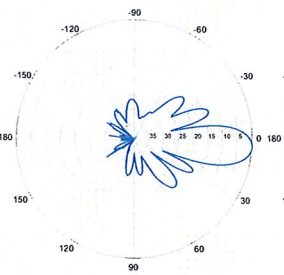
0° | Vertical

LPA-80063-4CF-EDIN-2



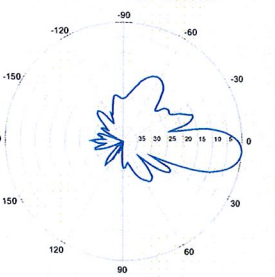
2° | Vertical

LPA-80063-4CF-EDIN-4



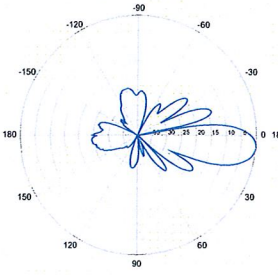
4° | Vertical

LPA-80063-4CF-EDIN-5



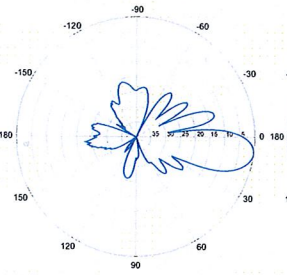
5° | Vertical

LPA-80063-4CF-EDIN-6



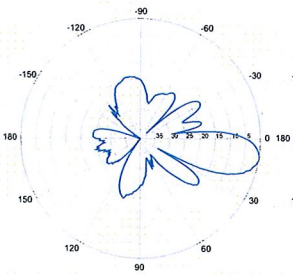
6° | Vertical

LPA-80063-4CF-EDIN-8



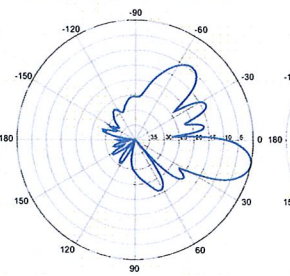
8° | Vertical

LPA-80063-4CF-EDIN-10



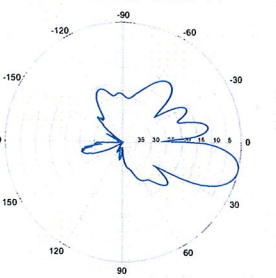
10° | Vertical

LPA-80063-4CF-EDIN-12



12° | Vertical

LPA-80063-4CF-EDIN-14



14° | Vertical

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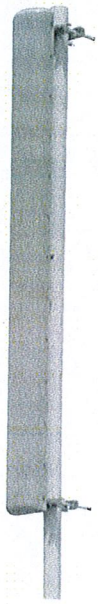
BXA-171063-12BF-EDIN-X

Replace 'X' with desired electrical downtilt.

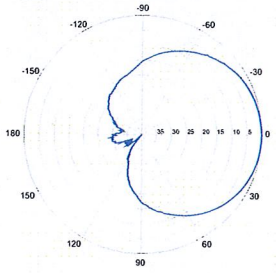
X-Pol | FET Panel | 63° | 19.0 dBi

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		

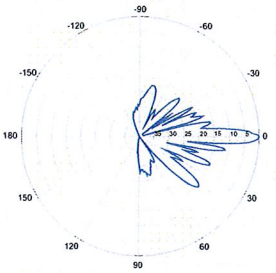


BXA-171063-12BF-EDIN-X



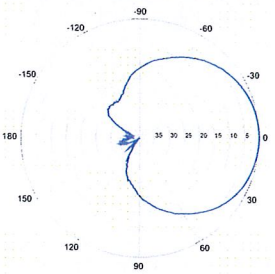
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



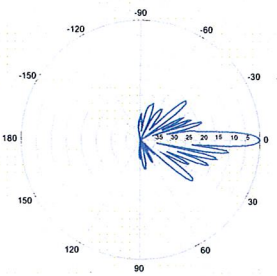
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



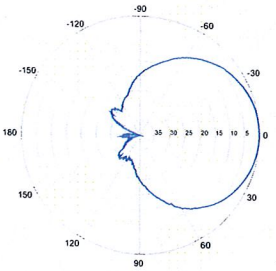
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-0



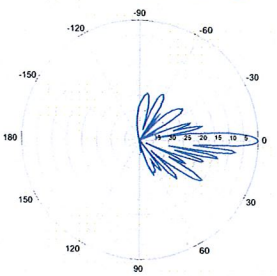
0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



0° | Vertical | 1920-2170 MHz

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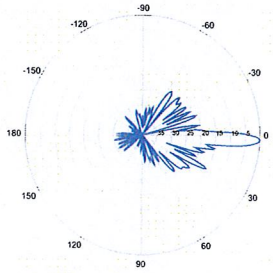
BXA-171063-12BF-EDIN-X

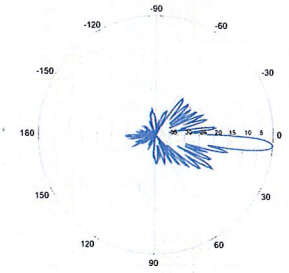
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



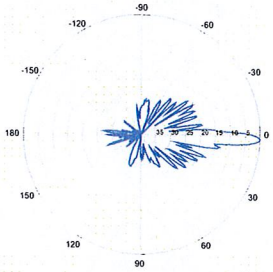
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



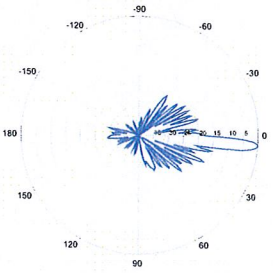
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



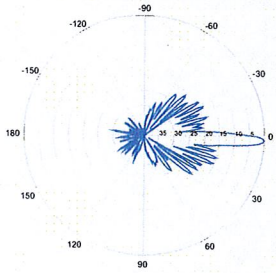
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-5



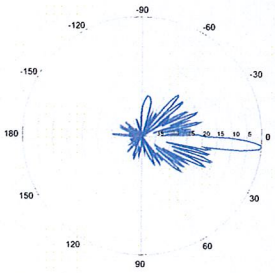
5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1920-2170 MHz

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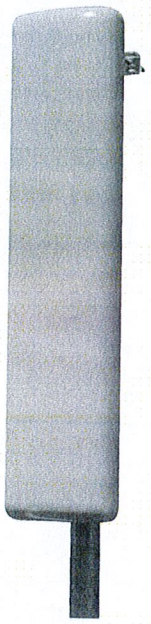
BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

Replace "X" with desired electrical downtilt.

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

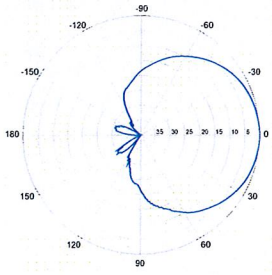


Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	17°	15°
Gain	12.5 dBd (14.6 dBi)	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 9, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-16.3 dB	-22.1 dB
Front-to-back ratio (+/-30°)	-36.1 dB	-34.9 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -30 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	

Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 285 x 133 mm	47.4 x 11.2 x 5.2 in
Depth with z-brackets	173 mm	6.8 in
Weight without mounting brackets	4.5 kg	9.9 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.34 m² Side: 0.16 m²	Front: 3.7 ft² Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 498 N Side: 260 N	Front: 111 lbf Side: 55 lbf

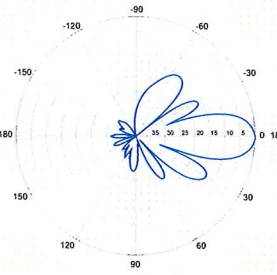
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	36210002	50-160 mm 2.0-6.3 in	4.5 kg 10 lbs
2-Point Downtilt Bracket Kit (0-20°)	36114003	50-160 mm 2.0-6.3 in	4.9 kg 11 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		
Concealment Configurations	For concealment configurations, order BXA-70063-4CF-EDIN-X-FP		

BXA-70063-4CF-EDIN-X



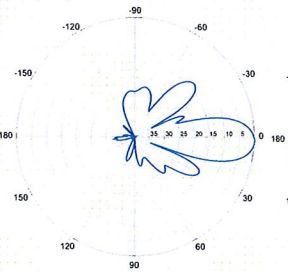
Horizontal | 750 MHz

BXA-70063-4CF-EDIN-0



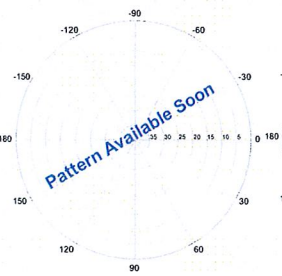
0° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-2



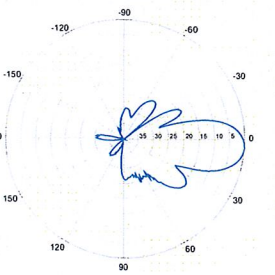
2° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-3

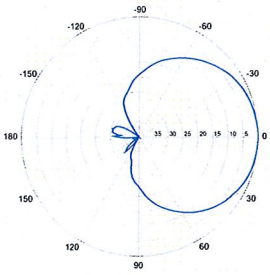


3° | Vertical | 750 MHz

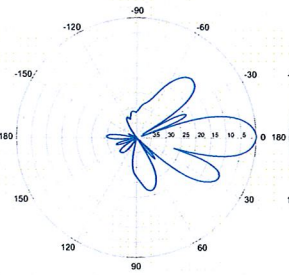
BXA-70063-4CF-EDIN-4



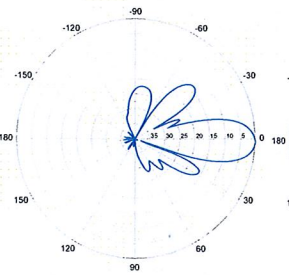
4° | Vertical | 750 MHz



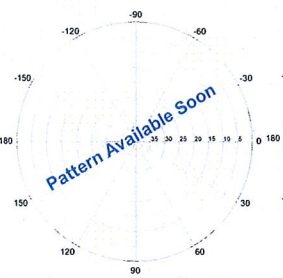
Horizontal | 850 MHz



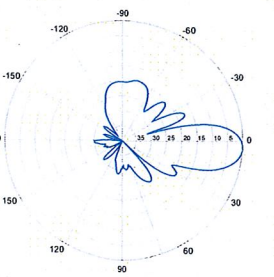
0° | Vertical | 850 MHz



2° | Vertical | 850 MHz



3° | Vertical | 850 MHz



4° | Vertical | 850 MHz

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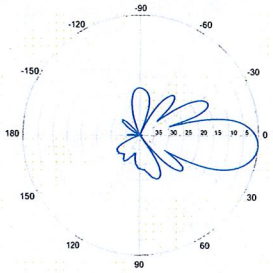
BXA-70063-4CF-EDIN-X

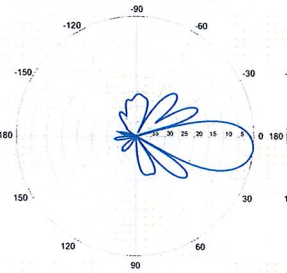
X-Pol | FET Panel | 63° | 13.0 dBd

BXA-70063-4CF-EDIN-5



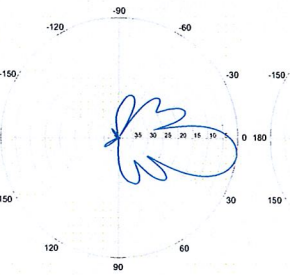
5° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-6



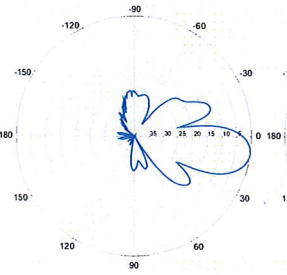
6° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-8



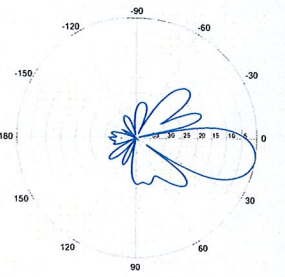
8° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-9

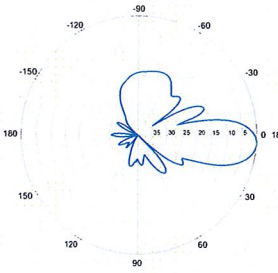


9° | Vertical | 750 MHz

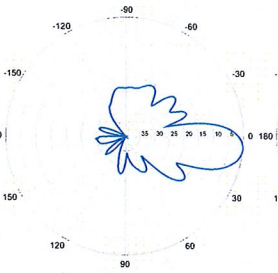
BXA-70063-4CF-EDIN-10



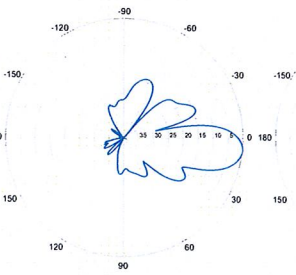
10° | Vertical | 750 MHz



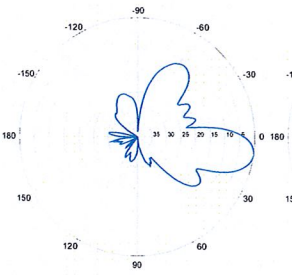
5° | Vertical | 850 MHz



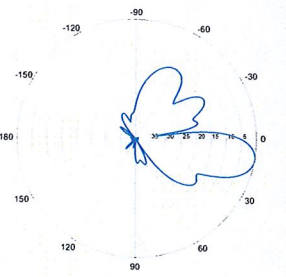
6° | Vertical | 850 MHz



8° | Vertical | 850 MHz

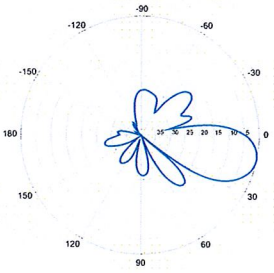


9° | Vertical | 850 MHz



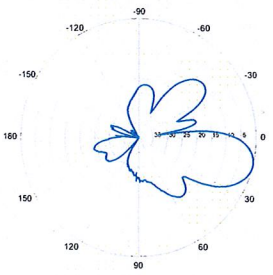
10° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-12

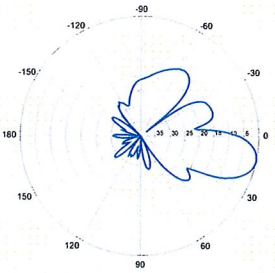


12° | Vertical | 750 MHz

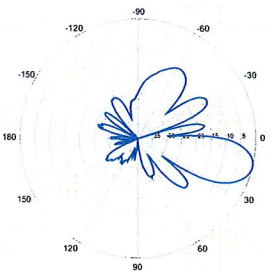
BXA-70063-4CF-EDIN-14



14° | Vertical | 750 MHz



12° | Vertical | 850 MHz



14° | Vertical | 850 MHz

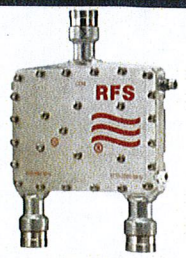
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

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

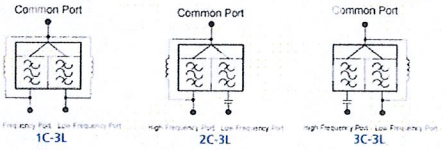
All information contained in the present datasheet is subject to confirmation at time of ordering

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

Other Documentation

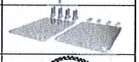
FD9R6004/2C-3L Installation Instructions: Wideband_Diplexer_Installation_Rev5.pdf

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



1C-3L 2C-3L 3C-3L

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)	

All information contained in the present datasheet is subject to confirmation at time of ordering

	General	Power	Density					
Site Name: Shelton N								
Tower Height: Verizon @ 91								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	1	500	108	0.0154	1900	1.0000	1.54%	
*AT&T UMTS	1	500	108	0.0154	880	0.5867	2.63%	
*AT&T GSM	6	427	108	0.0790	1900	1.0000	7.90%	
*AT&T GSM	6	296	108	0.0547	880	0.5867	9.33%	
*AT&T LTE	1	500	108	0.0154	740	0.4933	3.12%	
*Nextel	9	100	120	0.0225	860	0.5733	3.92%	
Verizon PCS	**15**	**309**	**91**	**0.2013**	**1970**	**1.0000**	**20.13%**	
Verizon Cellular	**9**	**289**	**91**	**0.1129**	**869**	**0.5793**	**19.50%**	
Verizon AWS	**1**	**771**	**91**	**0.0335**	**2145**	**1.0000**	**3.35%**	
Verizon 700	**1**	**596**	**91**	**0.0259**	**698**	**0.4653**	**5.56%**	
								76.97%
* Source: Siting Council								

TowerCo

PASS
(Shaft, **98%** capacity)

vertical solutions

February 5, 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: Shelton North**
TowerCo Designation	**Site Number: CT2009** **Site Name: Shelton-North** **JIRA Ticket: ENG-12535**
Engineering Firm Designation	**Vertical Solutions Project: 120148, Revision 0**
Site Data	**162 Birdseye Rd, Shelton, Fairfield County, CT 06484** **Latitude: N41° 19' 32.80"±; Longitude: W73° 8' 55.30"±** **Elevation: 593 ft±, Topography Category: 1;** **Exposure Category: "C"; Structure Class II; Site Class "D"** **118-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 TIA/EIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* (industry standard) and the *2003 International Building Code* (local building code) for:

- 85-mph fastest-mile basic wind speed
- 74-mph fastest-mile basic wind speed with 1/2-in radial ice

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

Sincerely,

Avery V. Fann, E.I.
Structural Engineer in Training

Reviewed by: MER

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED PROFESSIONAL ENGINEER
02/07/2012

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
120[1]	Sprint / Nextel (Existing)	Platform w/ Handrails	(9) Andrew DB844H90E-XY (3) Andrew 932LG65VTE-B	(9) 1 1/4 (6) 1 5/8	Inside
	Sprint / Nextel (Design)	Platform w/ Handrails	(12) Swedcom ALP-9212-N	(12) 1 5/8	Inside
108	AT&T	Low Profile Platform	(3) Kathrein 800-10121 (3) Powerwave P65-16-XLH-RR (6) Powerwave LGP-21401 (3) REC/RETs (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(6) 1 1/4 (1) 1/2 (1) 3/8 (2) 5/8	Inside
91[2]	**Verizon**	Low Profile Platform	**(3) Antel BXA-70063/4CF** **(6) Antel LPA-80063/4CF** **(3) Antel BXA-171063/12BF** **(6) RFS FD9R6004/2C-3L diplexers**	(12) 1 5/8	Inside

1. Design loading was used in the analysis.
2. Verizon to remove (6) Antel LPA-80080/4CF and (6) Antel LPA-185080/8CF

Table 2: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
118 to 77.0	91	O. K.	-	-
77.0 to 40.8	88	O. K.	-	-
40.8 to 0	**98**	**O. K.**	87	O. K.

Table 3: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized[1]	Result
Moment	2040 kip-ft	2000 kip-ft	98	O. K.
Shear	24 kip	23 kip	96	O. K.

1 – Percent utilization based on ratio of analysis reactions to design reactions.

Attachments:

- Project History
- Coax configuration, QP-P
- Program input and output – wind
- Base plate and anchor rod plan and calculations

Project History

VSi Project #: 120148, Revision 0
TowerCo Site Id: CT2009
TowerCo Site Name: Shelton-north

Design Documents						
TowerCo Document	**Structure**	**Issued Date**	**Document ID**	**Issued By**	**Issued To**	**Description**
506284	CT2009	6/5/2000	506284_CT2009 Shelton-North Geotechnical Report - 06-05-2000.pdf	Geotechnical Engineering	Diversified Technology Consultants	Geotechnical Investigation
723709	CT2009	7/10/2000	723709_CT2009 Shelton-North Tower and Foundation Design Drawings and Calculations - 07-10-2000.pdf	Paul J. Ford	Summit Manufacturing, LLC	Tower and Foundation Design Calculations
506288	CT2009	8/1/2000	506288_CT2009 Shelton-North CD-s 8-1-00.pdf	Diversified Technology Consultants	Nextel	Construction Drawings
723706	CT2009	11/15/2000	723706_CT2009 Shelton-North Tower and Foundation Design Calculations - 11-15-2000.pdf	Paul J. Ford	Summit Manufacturing, LLC	Tower and Foundation Design Calculations
242461	CT2009	3/5/2002	242461_CT2009 Shelton-North PJF Structural Analysis AT&T CoLo 03-05-2002.pdf	Paul J. Ford	Natcomm, LLC	Structural Analysis Report
197435	CT2009	5/3/2002	197435_CT2009 Shelton-North CT0921T AT&T Site Agreement.pdf	Nextel	AT&T	Site Lease Agreement
242447	CT2009	5/31/2002	242447_CT2009 Shelton-North CT0921 Site Agreement.pdf	Nextel	AT&T	Site Lease Agreement
242460	CT2009	11/19/2002	242460_CT2009 Shelton-North PJF Structural Analysis Verizon CoLo 11-19-2002.pdf	Paul J. Ford	Structure Consulting Group	Structural Analysis Report
242462	CT2009	1/13/2003	242462_CT2009 Shelton-North CT0921T Executed Verizon License Supplement.pdf	Cellco	Nextel	Site Lease Agreement
516756	CT2009	1/13/2003	516756_CT2009 Shelton-north Verizon SLA.pdf	Cellco	Nextel	Site Lease Agreement
242426	CT2009	8/14/2006	242426_CT2009 Shelton-North CT09211 Sprint SLA.pdf	Nextel	Sprint Spectrum	Site Lease Agreement
242429	CT2009	8/7/2007	242429_CT2009 Shelton-North Cingular Feasibility Structural Evaluation 8-7-07.pdf	Malouf Engineering Intl	Hudson Design Group	Structural Analysis Report
197434	CT2009	2/19/2008	197434_CT2009 Shelton-North 02 First Amendment New Cingular SLA.pdf	Nextel	New Cingular	Amendment SLA
242427	CT2009	2/19/2008	242427_CT2009 Shelton-North CT0921 First Amend to New Cingular SLA.pdf	Nextel	New Cingular	Amendment SLA
242436	CT2009	2/19/2008	242436_CT2009 Shelton-North Cingular First Amendment to SLA.pdf	Nextel	New Cingular	Amendment SLA
711884	CT2009	9/23/2008	711884_CT2009 Shelton-north SLA.pdf	TowerCo	Nextel	Site Lease Agreement
714948	CT2009	11/2/2008	714948_CT2009 Shelton-north Tower Profile.pdf	SiteMaster	TowerCo	Tower Profile Drawing

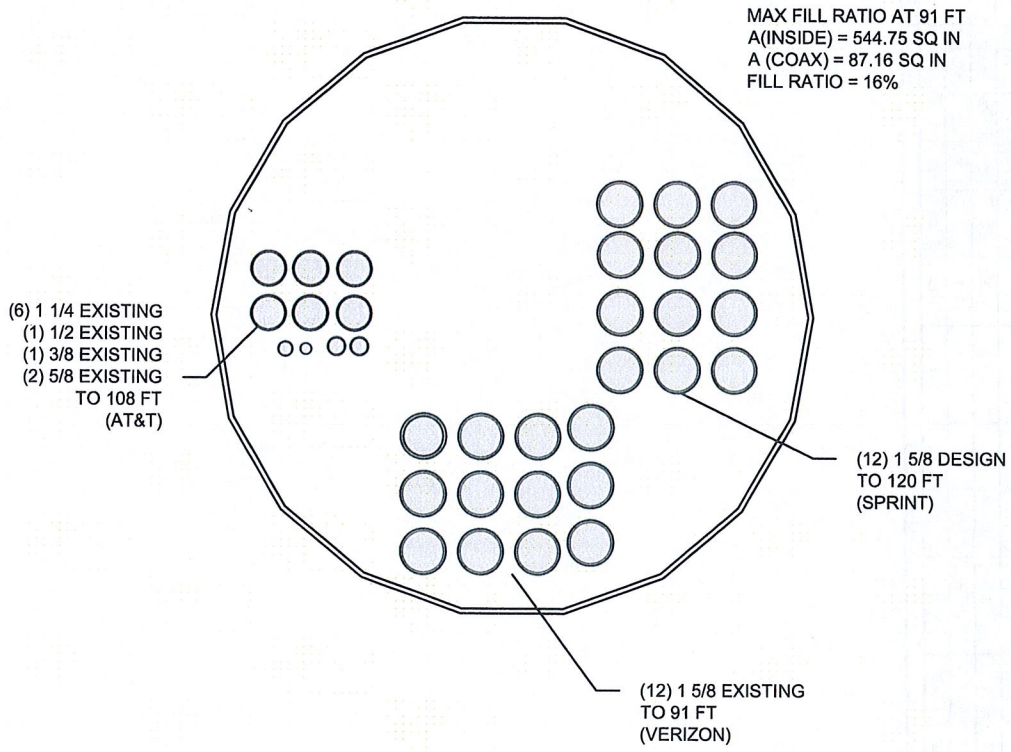
Design Documents						
TowerCo Document	Structure	Issued Date	Document ID	Issued By	Issued To	Description
719729	CT2009	11/2/2008	719729_CT2009 Shelton-north SiteMaster Inspection Report.pdf	SiteMaster	TowerCo	Tower Inspection Report
826220	CT2009	3/4/2011	826220_CT2009 Shelton-north _Vertical_Structural Analysis_T-Mobile_Colocation_20110304.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
708806	CT2009	3/21/2011	708806_CT2009 Shelton-north Site Plan.pdf	TowerCo		Site Plan
840071	CT2009	5/16/2011	840071_CT2009 Shelton-north _Vertical_Structural Analysis_AT&T_Reconfiguration_20110516.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
843371	CT2009	7/5/2011	843371_CT2009 Shelton-north 2nd Amendment - New Cingular Wireless.pdf	TowerCo	New Cingular	Amendment SLA
846653	CT2009	8/10/2011	846653_CT2009 Shelton-north AT&T 2nd Amendment Rent Comm Notice.pdf	TowerCo	New Cingular	Amendment SLA
--	CT2009	12/15/2011	TowerCo Shelton North.doc	Verizon	TowerCo	Reconfiguration Tenant Application
859678	CT2009	1/6/2012	859678_CT2009 Shelton-north _Vertical_Structural Analysis_Verizon_Reconfiguration_20120106.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
860825	CT2009	1/26/2012	860825_CT2009 Shelton-north Verizon 1st Amendment to SLA Fully Executed.pdf	TowerCo	Cellco	Amendment SLA
860878	CT2009	1/27/2012	860878_CT2009 Shelton-north Verizon 1st Amendment Rent Commencement Notice.pdf	TowerCo	Verizon	Commencement Notice
--	CT2009	1/30/2012	CT2009 SA Loading.xls	TowerCo	Vertical Solutions	SA Loading
--	CT2009	1/30/2012	TowerCo Shelton North. [1]doc.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 - 91 FT

SCALE: 1–1/2" = 1'–0"

PROJECT INFORMATION:

Shelton-North
SITE #: CT2009

162 Birdseye Rd
Shelton, CT 06484
(Fairfield County)

REV	DATE:	Issued For:
0	02-05-12	TowerCo, LLC.

DRAWN BY: AVF | CHECKED BY: MER

SHEET NUMBER: **QP-P**

REVISION: 0

VSI #: 120148

PLANS PREPARED FOR:
TowerCo
5000 Valleystone Drive
Cary, NC 27519
Office (919) 469-5559
Fax (919) 469-5530

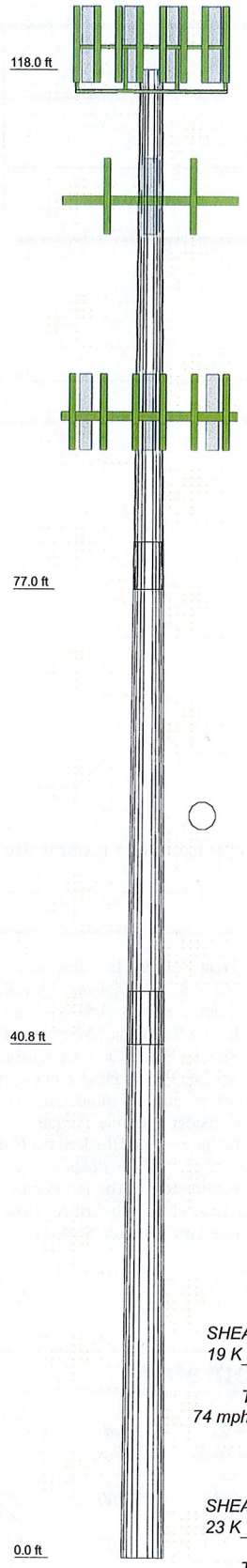
PLANS PREPARED BY:
vertical solutions
2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

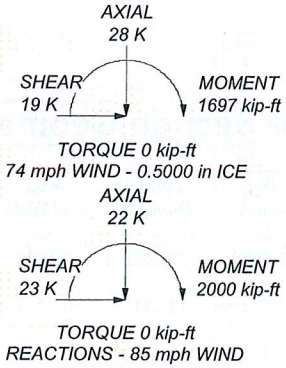
SELF-SUPPORTING POLE STRUCTURE, FILL RATIO TOOL

Fill Ratio

			Group 1			Group 2			Group 3			Group 4			Group 5			Group 6			A_{LA}	FR	Result
Section Letter	Elevation (ft)	Section #	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	(in2)		
D	118	1	12	1-5/8	36.95																36.95	10%	O.K.
C	108	1	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19				50.21	12%	O.K.
B	91	1	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19	12	1-5/8	36.95	87.16	16%	O.K.
A	0	3	12	1-5/8	36.95	6	1-1/4	11.62	1	1/2	0.31	1	3/8	0.15	2	5/8	1.19	12	1-5/8	36.95	87.16	7%	O.K.
Carrier:			Sprint / Nextel - Design			AT&T - Existing												Verizon - Existing			Max =	16%	O.K.

Section	1	2	3
Length (ft)	41.00	40.00	45.00
Number of Sides	12	12	12
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)	3.75	4.25	
Top Dia (in)	22.0000	27.7713	33.0448
Bot Dia (in)	28.7650	34.3710	40.4700
Grade		A572-65	
Weight (K)	2.1	4.2	6.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
(4) ALP 9212-N w/Mount Pipe (Sprint)	120	Antel BXA-70063/4CFw/ Mount Pipe (Verizon)	91
PiROD 13' Platform w/handrail (Sprint)	118	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	(2) Antel LPA-80063/4CF w MP (Verizon)	91
Kathrein 800 10121 (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	Antel BXA-171063/12 BF w/MP (Verizon)	91
Powerwave P65-16-XLH-RR w/ MP (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	(2) RFS FD9R6004/2C-3L (Verizon)	91
(2) Powerwave LGP21401 (ATI)	108	PiROD 13' Low Profile Platform (Verizon)	91
REC/RETs (ATI)	108		
REC/RETs (ATI)	108		
REC/RETs (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
(2) Ericsson RRUS-11 (ATI)	108		
Raycap DC6-48-60-18-8F (ATI)	108		
PiROD 13' Low Profile Platform (ATI)	108		

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 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 60 mph wind.
5. TOWER RATING: 98.3%

"Execute and Deliver"

Vertical Solutions, Inc.
2002 Production Drive
Apex, NC 27539
Phone: (888) 321-6167
FAX: (919) 321-1768

Job: *CT2009-ERP*			
Project: *ENG-12535 (98%)*			
Client: TowerCo, LLC.	Drawn by: afann	App'd:	
Code: TIA/EIA-222-F	Date: 02/05/12	Scale: NTS	
Path: L:\2012\0148_Shelton-North_CT\Task 1\Models\SAR\tnxTowerCT2009-ERP.er		Dwg No. E-1	

Tower Input Data

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

Tower is located in Fairfield 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.
Temperature drop of 50 °F.
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 1.333.
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	118.00-77.00	41.00	3.75	12	22.0000	28.7650	0.1875	0.7500	A572-65 (65 ksi)
L2	77.00-40.75	40.00	4.25	12	27.7713	34.3710	0.3125	1.2500	A572-65 (65 ksi)
L3	40.75-0.00	45.00		12	33.0448	40.4700	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	13.1693	799.7595	7.8089	11.3960	70.1790	1620.5296	6.4815	5.3935	28.765
	29.7797	17.2537	1798.5222	10.2307	14.9003	120.7040	3644.2935	8.4917	7.2065	38.435
L2	29.3915	27.6304	2659.0967	9.8302	14.3855	184.8455	5388.0509	13.5988	6.6052	21.137
	35.5835	34.2714	5074.2095	12.1929	17.8042	285.0011	10281.7241	16.8673	8.3739	26.797
L3	34.9365	39.4488	5374.1723	11.6958	17.1172	313.9634	10889.5300	19.4155	7.8510	20.936
	41.8976	48.4147	9934.4480	14.3540	20.9635	473.8935	20129.8851	23.8282	9.8410	26.243

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				1	1	1		
118.00-77.00								
L2 77.00-40.75				1	1	1		
L3 40.75-0.00				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
LDF7-50A (1-5/8 FOAM) (Sprint) ****	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
LDF4P-50A (1/2 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF2-50A (3/8 FOAM) (AT&T)	C	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
LDF4.5-50 (5/8 FOAM) (AT&T) ***	C	No	Inside Pole	108.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM) (Verizon) ***	C	No	Inside Pole	91.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

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	118.00-77.00	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	0.68
L2	77.00-40.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	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
		C	0.000	0.000	0.000	0.000	0.88
L3	40.75-0.00	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	0.000	0.98

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	118.00-77.00	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	0.68
L2	77.00-40.75	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	0.88
L3	40.75-0.00	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	0.98

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
(4) ALP 9212-N w/Mount Pipe (Sprint)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(4) ALP 9212-N w/Mount Pipe (Sprint)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(4) ALP 9212-N w/Mount Pipe (Sprint)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
PiROD 13' Platform w/handrail (Sprint)	C	None		0.0000	118.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
***									
Kathrein 800 10121 (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Kathrein 800 10121 (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Kathrein 800 10121 (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
Powerwave P65-16-XLH-RR w/ MP	A	From Leg	3.00 0.00	0.0000	108.00	No Ice 1/2" Ice	8.64 9.29	6.36 7.54	0.09 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						
Powerwave P65-16-XLH-RR	B	From Leg	3.00	0.0000	108.00	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						
Powerwave P65-16-XLH-RR	C	From Leg	3.00	0.0000	108.00	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						
(2) Powerwave LGP21401	A	From Leg	3.00	0.0000	108.00	No Ice	0.00	0.37	0.02
(AT&T)			0.00			1/2" Ice	0.00	0.48	0.03
			0.00						
(2) Powerwave LGP21401	B	From Leg	3.00	0.0000	108.00	No Ice	0.00	0.37	0.02
(AT&T)			0.00			1/2" Ice	0.00	0.48	0.03
			0.00						
(2) Powerwave LGP21401	C	From Leg	3.00	0.0000	108.00	No Ice	1.43	0.37	0.02
(AT&T)			0.00			1/2" Ice	1.59	0.48	0.03
			0.00						
REC/RETs	A	From Leg	3.00	0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00			1/2" Ice	0.00	0.81	0.02
			0.00						
REC/RETs	B	From Leg	3.00	0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00			1/2" Ice	0.00	0.81	0.02
			0.00						
REC/RETs	C	From Leg	3.00	0.0000	108.00	No Ice	0.00	0.68	0.01
(AT&T)			0.00			1/2" Ice	0.00	0.81	0.02
			0.00						
(2) Ericsson RRUS-11	A	From Leg	3.00	0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00						
(2) Ericsson RRUS-11	B	From Leg	3.00	0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00						
(2) Ericsson RRUS-11	C	From Leg	3.00	0.0000	108.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00						
Raycap DC6-48-60-18-8F	C	From Leg	3.00	0.0000	108.00	No Ice	0.00	1.20	0.05
(AT&T)			0.00			1/2" Ice	0.00	1.38	0.06
			0.00						
PiROD 13' Low Profile	A	None		0.0000	108.00	No Ice	15.70	15.70	1.30
Platform						1/2" Ice	20.10	20.10	1.76
(AT&T)									
***									
Antel BXA-70063/4CFw/	A	From Leg	3.00	0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00			1/2" Ice	5.86	4.32	0.07
(Verizon)			0.00						
Antel BXA-70063/4CFw/	B	From Leg	3.00	0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00			1/2" Ice	5.86	4.32	0.07
(Verizon)			0.00						
Antel BXA-70063/4CFw/	C	From Leg	3.00	0.0000	91.00	No Ice	5.41	3.70	0.03
Mount Pipe			0.00			1/2" Ice	5.86	4.32	0.07
(Verizon)			0.00						
(2) Antel LPA-80063/4CF w	A	From Leg	3.00	0.0000	91.00	No Ice	7.26	7.27	0.04
MP			0.00			1/2" Ice	7.73	7.98	0.10
(Verizon)			0.00						
(2) Antel LPA-80063/4CF w	B	From Leg	3.00	0.0000	91.00	No Ice	7.26	7.27	0.04
MP			0.00			1/2" Ice	7.73	7.98	0.10
(Verizon)			0.00						
(2) Antel LPA-80063/4CF w	C	From Leg	3.00	0.0000	91.00	No Ice	7.26	7.27	0.04

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
MP			0.00			1/2" Ice	7.73	7.98	0.10
(Verizon)			0.00						
Antel BXA-171063/12 BF	A	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
Antel BXA-171063/12 BF	B	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
Antel BXA-171063/12 BF	C	From Leg	3.00	0.0000	91.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00						
(2) RFS FD9R6004/2C-3L	A	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
(2) RFS FD9R6004/2C-3L	B	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
(2) RFS FD9R6004/2C-3L	C	From Leg	3.00	0.0000	91.00	No Ice	0.37	0.08	0.00
(Verizon)			0.00			1/2" Ice	0.45	0.14	0.00
			0.00						
PiROD 13' Low Profile	C	None		0.0000	91.00	No Ice	15.70	15.70	1.30
Platform						1/2" Ice	20.10	20.10	1.76
(Verizon)									

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	118 - 77 (1)	TP28.765x22x0.1875	41.00	0.00	0.0	34.465	16.8801	-7.60	581.78	0.013
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	40.00	0.00	0.0	39.000	33.5658	-12.74	1309.06	0.010
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	45.00	0.00	0.0	39.000	48.4147	-21.86	1888.17	0.012

Pole Bending Design Data

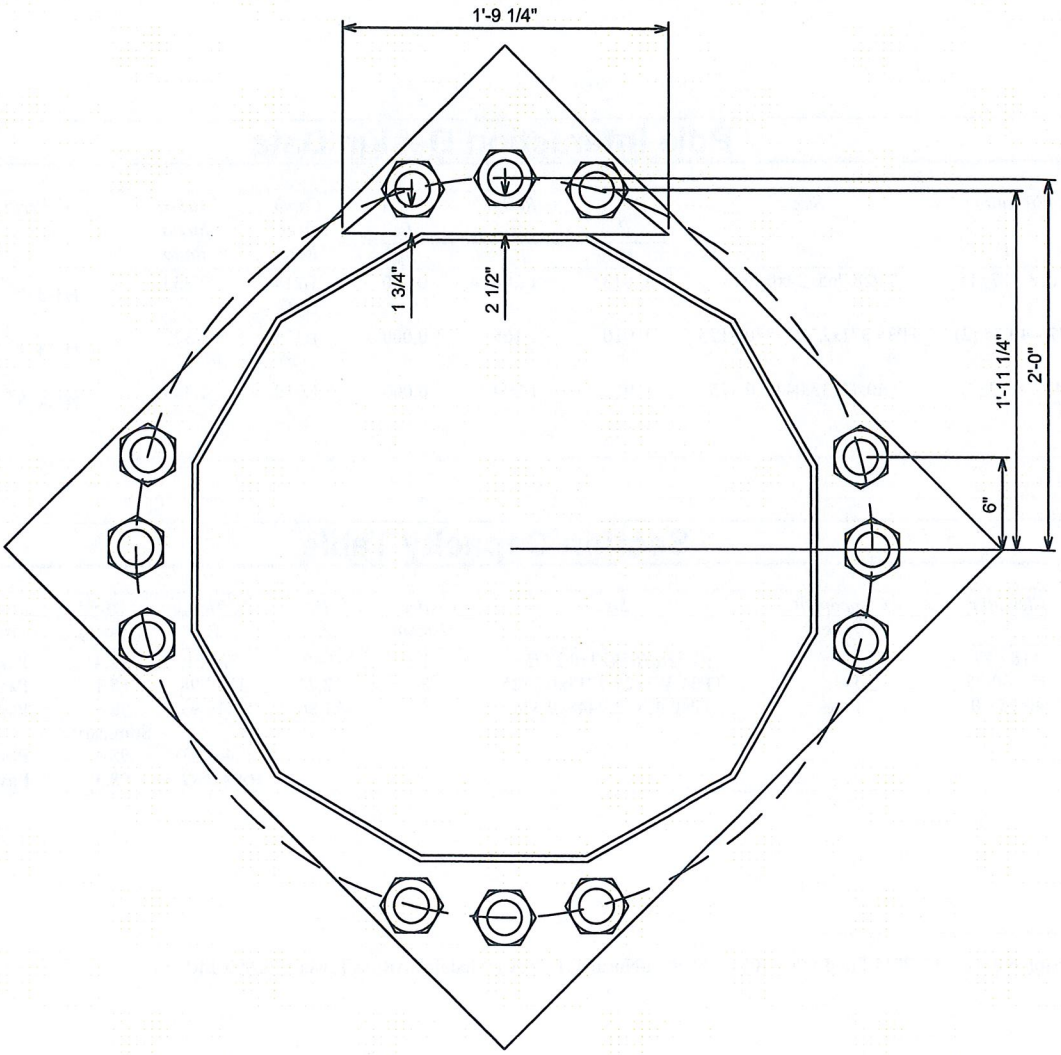
Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	118 - 77 (1)	TP28.765x22x0.1875	400.10	-41.562	34.465	1.206	0.00	0.000	34.465	0.000
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	1034.96	-45.437	39.000	1.165	0.00	0.000	39.000	0.000
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	2000.27	-50.651	39.000	1.299	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	118 - 77 (1)	TP28.765x22x0.1875	0.013	1.206	0.000	1.219 ✓	1.333	H1-3 ✓
L2	77 - 40.75 (2)	TP34.371x27.7713x0.3125	0.010	1.165	0.000	1.175 ✓	1.333	H1-3 ✓
L3	40.75 - 0 (3)	TP40.47x33.0448x0.375	0.012	1.299	0.000	1.310 ✓	1.333	H1-3 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	118 - 77	Pole	TP28.765x22x0.1875	1	-7.60	775.51	91.4	Pass
L2	77 - 40.75	Pole	TP34.371x27.7713x0.3125	2	-12.74	1744.98	88.1	Pass
L3	40.75 - 0	Pole	TP40.47x33.0448x0.375	3	-21.86	2516.93	98.3	Pass
							Summary	
						Pole (L3)	98.3	Pass
						RATING =	**98.3**	**Pass**



BASE PLATE LAYOUT

SCALE: 1" = 1'-0"

PROJECT INFORMATION:

Shelton-North
SITE #: CT2009

162 Birdseye Rd
Shelton, CT 06484
(Fairfield County)

0	02-05-12	TowerCo, LLC.
REV	DATE:	Issued For:

DRAWN BY: AVF | CHECKED BY: MER

SHEET NUMBER: **BP**

REVISION: 0

VSI #: 120148

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.: 120148
Date: 02/05/2012
Calculated by: AVF

BASE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input -

$M := 2000 \cdot kip \cdot ft$ = moment at top of flange plate

$P := 22 \cdot kip$ = axial load (use zero if base plate is grouted)

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

$b_{eff} := 21.25 \cdot in$ = effective width of base plate in flexure

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

$ASI := 133 \cdot \%$ = allowable stress increase

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 2 \\ 0 \end{pmatrix} \qquad d := \begin{pmatrix} 24 \\ 23.25 \\ 6 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad A_{stiff} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 0 \end{pmatrix} in^2 \qquad A_{stress} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 0 \end{pmatrix} in^2 \qquad F_t := \begin{pmatrix} 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0.60 \cdot 75 \\ 0 \end{pmatrix} \cdot ksi$$

$$\sum \overrightarrow{(Q)} = 12 \qquad sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_{stiff}\right)}$$

$sumQAd = 13764 \cdot in^4$

$$R := \frac{M \cdot \overrightarrow{\left(d \cdot A_{stiff}\right)}}{sumQAd} + \frac{P \cdot A_{stiff}}{\sum \overrightarrow{\left(A_{stiff} \cdot Q\right)}}$$

Anchor Rods =

$$f_t := \overrightarrow{\left(\frac{R}{A_{stress}}\right)} \qquad r := \overrightarrow{\left(\frac{f_t}{ASI \cdot F_t}\right)}$$

$$R = \begin{pmatrix} 168.4 \\ 163.2 \\ 43.5 \\ 1.8 \\ 0.0 \end{pmatrix} \cdot kip \qquad f_t = \begin{pmatrix} 51.8 \\ 50.2 \\ 13.4 \\ 0.6 \\ 0.0 \end{pmatrix} \cdot ksi \qquad r = \begin{pmatrix} 87 \\ 84 \\ 22 \\ 1 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress

$$m := \begin{pmatrix} 2.5 \\ 1.75 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot R \cdot m\right]} \qquad M_{PL} = \begin{pmatrix} 35.1 \\ 47.6 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot ft \qquad \sum M_{PL} = 992.1 \cdot kip \cdot in$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6}\right)} \qquad f_b = 26.5 \cdot ksi$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

Base Plate =

$r_b = 53 \cdot \%$
