

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

January 3, 2011

RECEIVED
JAN - 4 2011

CONNECTICUT
SITING COUNCIL

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

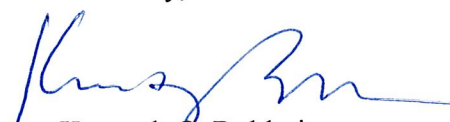
Re: **EM-VER-142-100802** – 208 Reed Road, Tolland, Connecticut
Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify you and the Connecticut Siting Council that the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facility has now been activated.

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

Sincerely,



Kenneth C. Baldwin



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

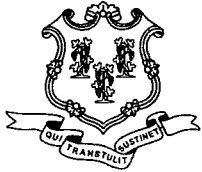
SARASOTA

www.rc.com

KCB/kmd

Copy to:

Sandy M. Carter



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

November 2, 2010

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

RE: **EM-VER-142-100802** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 208 Reed Road, Tolland, Connecticut. Modification of Acknowledgment.

Dear Attorney Baldwin:

In addition to the Connecticut Siting Council (Council) acknowledgement dated August 23, 2010 (filing dated August 2, 2010), the Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

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

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 18, 2010. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. 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
Executive Director

LR/CDM/laf

- c: The Honorable Frederick M. Daniels, Chairman Town Council, Town of Tolland
- Steven R. Werbner, Town Manager, Town of Tolland
- Linda Farmer, Town Planner, Town of Tolland
- Thomas J. Regan, Esq., Brown Rudnick LLP (o/b/o TowerCo)

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Hartford, CT 06103-3597
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Direct (860) 275-8345

ORIGINAL

October 18, 2010

RECEIVED
OCT 19 2010

CONNECTICUT
SITING COUNCIL

Michael Perrone
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-142-100802 – Cellco Partnership d/b/a Verizon Wireless
208 Reed Road, Tolland, Connecticut**

Dear Mr. Perrone:

On August 23, 2010, the Siting Council acknowledged receipt of Cellco's notice of intent to modify the above-referenced telecommunications facility. This modification involved the installation of twelve antennas at the 127-foot level of the 150-foot tower. Cellco now needs to change the cellular antenna model from that which was previously approved.

Attached to this letter is an updated Structural Analysis Report verifying that the tower can support the previously approved co-location on the tower with the new cellular antenna model.

If you have any questions regarding any of these materials, please do not hesitate to contact me or Rachel Mayo.



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

www.rc.com

Sincerely,

A handwritten signature in blue ink, appearing to read 'Ken Baldwin', written over a horizontal line.

Kenneth C. Baldwin

Attachment

Copy to:

Sandy M. Carter
Brian Ragozzine
Mark Gauger



PASS
(Foundation, 78% capacity)



September 22, 2010

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: CT2005
Site Name: Tolland 2

TowerCo Designation Site Number: CT2005
Site Name: Tolland-Reed Road

Engineering Firm Designation Vertical Solutions Project: 100157.04, Rev0

Site Data 208 Reed Road, Tolland, Tolland County, CT 06084
Latitude: N41° 51' 12.10"±; Longitude: W072° 24' 22.10"±
Elevation: 780 ft±, Topography Category: 1;
Exposure Category: "C"; Structure Class II;
150-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-F-1996, *Structural Standard for Antenna Supporting Structures and Antennas* (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,

Kingsley C. Igboanugo, E.I.
Structural Engineer-In-Training



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

09/22/2010

Table 1: Existing, Proposed and Reserved Appurtenance Configuration

Elevation (AGL, ft)	Carrier	Mount	Equipment	Coax	Location ²
149.08 ¹	Sprint/ Nextel	Low Profile Platform	(9) Decibel DB844H90E-XY (3) Kathrein AP11-880/090D/XP	(15) 1 1/4	Inside
140.50	T-Mobile	Side Arms	(3) EMS RR90-17-00DP	(6) 1 5/8	Inside
127.00	Verizon	Low Profile Platform	(4) Antel LPA-80080/6 (2) Antel LPA-80063/6 (3) Antel BXA-185063/12CF_2 (3) Antel BXA-70063/6CF 2	(12) 1 5/8	Inside ³

1 – Existing (current) equipment [EPA(A) = 73.5 sq ft] listed above and used in analysis. Tower Design loading was located within 2 feet of existing loading.

2 – See coax configuration plan, QP-for coax locations.

3 – Hand hole rim located within 5-ft of proposed loading

Table 2: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
150 to 120.96	17	O. K.	-	-
120.96 to 81.21	44	O. K.	-	-
81.21 to 39.67	53	O. K.	-	-
39.67 to 0	57	O. K.	14	O. K.

Table 3: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized	Result
Moment	4612 k-ft	2905 k-ft	63	O. K.
Shear	39 k	30 k	78	O. K.

Attachments:

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

Project History, 100157.04 Tolland Reed Road_CT2005

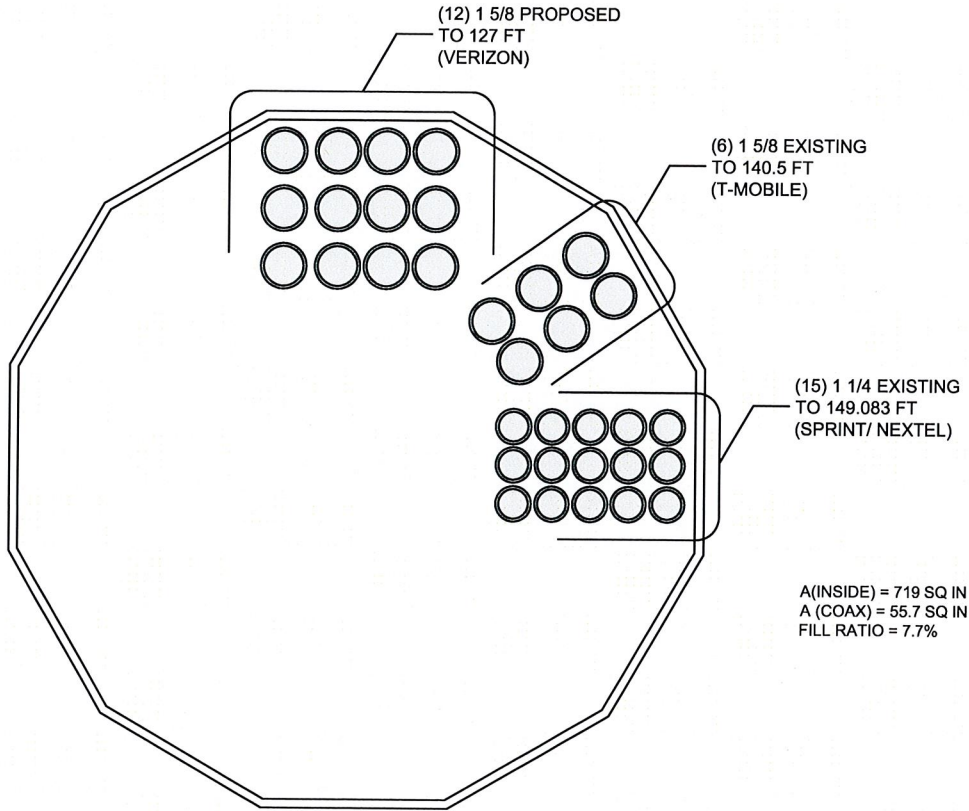
Design Documents						
TowerCo Document	Structure	Document ID	Issued Date	Issued By	Issued To	Description
197391	CT2005	19971126_TFDC_CT2005.pdf	11/26/1997	Engineered Endeavors Inc.	Nextel	Tower and Foundation Design Calculations
742213	CT2005	19971210_GEO_CT2005.pdf	12/10/1997	Applied Earth Technologies	Nextel	Geotechnical Investigation
711880	CT2005	20080923_SLA_CT2005.pdf	9/23/2008	Nextel	TowerCo	Site Lease Agreement
--	CT2005	20100128_CTA_CT2005.pdf	1/28/2010	Verizon	TowerCo	Co-location Tenant Application
--	CT2005	20100915_CTA_CT2005.pdf	9/15/2010	Verizon	TowerCo	Co-location Tenant Application

Table Note:

Files name format YYYYMMDD-XXX-ZZZZZZ.pdf

Where:

- YYYY=year
- MM=month
- DD=day published/issued
- XXX=file describer
- ZZZZZ=TowerCo Site ID



COAX CONFIGURATION PLAN AT 127.0-FT

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

DRAWN BY:	KCI	CHECKED BY:	MILL
SHEET NUMBER:	QP-P		
REVISION:	0		
VSI #:	100157.04		

REV	DATE
0	09/21/2010

PREPARED FOR:

TowerCo

5000 Valley Stone Drive
Cary, NC 27519
Office: (919) 469-5559
Fax: (919) 469-5630
www.towerco.com

PROJECT NAME:

Tolland Road

TOWERCO JOB #:

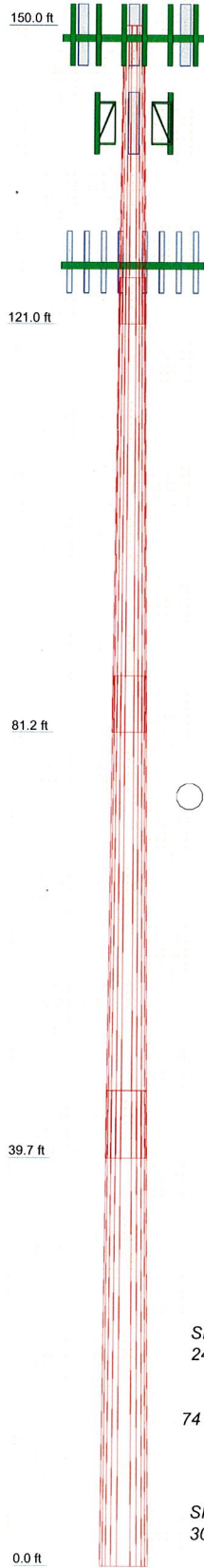
CT2005

PREPARED BY:

vertical solutions

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768
www.verticalsolutions-inc.com

Section	1	2	3	4	
Length (ft)	29.040	44.250	47.040	46.253	
Number of Sides	12	12	12	12	
Thickness (in)	0.313	0.375	0.438	0.500	
Socket Length (ft)	4.500	5.500	6.583	45.953	
Top Dia (in)	24.871	30.262	38.031	45.953	
Bot Dia (in)	31.990	39.990	48.260	56.000	
Grade			A572-65		
Weight (K)	2.8	6.3	9.6	12.8	31.5



DESIGNED APPURTENANCE LOADING

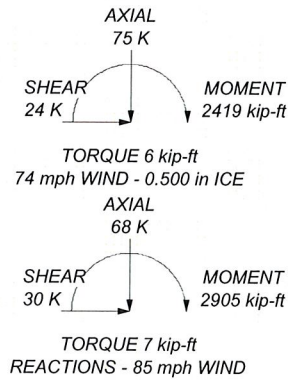
TYPE	ELEVATION	TYPE	ELEVATION
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	Pirod 4' Side Mount Standoff (1) (T-Mobile [Existing])	140.5
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	(2) Antel LPA 80080/6 with Mount Pipe (Verizon [Proposed])	127
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	(2) Antel LPA-80063/6 w MP (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	(2) Antel LPA 80080/6 with Mount Pipe (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	BXA-185063/12CF_2 w MP (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	BXA-185063/12CF_2 w MP (Verizon [Proposed])	127
PIROD 13' Low Profile Platform (Sprint/Nextel [Existing])	149.083	BXA-185063/12CF_2 w MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-70063/6CF_2 w MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-70063/6CF_2 w MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-70063/6CF_2 w MP (Verizon [Proposed])	127
Pirod 4' Side Mount Standoff (1) (T-Mobile [Existing])	140.5	PIROD 13' Low Profile Platform (Verizon [Proposed])	127
Pirod 4' Side Mount Standoff (1) (T-Mobile [Existing])	140.5		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland 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.



 TowerCo 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	TowerCo, LLC Job: CT2005
	Project: 100157.04
	Client: TowerCo Drawn by: kingsley App'd:
	Code: TIA/EIA-222-F Date: 09/22/10 Scale: NTS
	Path: L:\2010\10157 Tolland-reed Rd\Task 4 -6\Models\100157_04.dwg Dwg No. E-1

RISATower TowerCo, LLC 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	Job CT2005	Page 1 of 6
	Project 100157.04	Date 10:16:59 09/22/10
	Client TowerCo	Designed by kingsley

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 Tolland County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.500 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	150.000-120.960	29.040	4.500	12	24.871	31.990	0.313	1.250	A572-65 (65 ksi)
L2	120.960-81.210	44.250	5.500	12	30.262	39.990	0.375	1.500	A572-65 (65 ksi)
L3	81.210-39.670	47.040	6.583	12	38.031	48.260	0.438	1.750	A572-65 (65 ksi)
L4	39.670-0.000	46.253		12	45.953	56.000	0.500	2.000	A572-65 (65 ksi)

RISATower TowerCo, LLC 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469-5559 FAX: (919) 469-5530	Job CT2005	Page 2 of 6
	Project 100157.04	Date 10:16:59 09/22/10
	Client TowerCo	Designed by kingsley

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	25.749	24.712	1902.480	8.792	12.883	147.669	3854.939	12.163	5.828	18.65
	33.118	31.875	4082.672	11.341	16.571	246.377	8272.601	15.688	7.736	24.755
L2	32.354	36.088	4114.493	10.700	15.676	262.476	8337.079	17.762	7.105	18.947
	41.401	47.835	9581.910	14.182	20.715	462.563	19415.547	23.543	9.712	25.9
L3	40.611	52.960	9553.297	13.458	19.700	484.939	19357.570	26.065	9.020	20.617
	49.962	67.370	19666.030	17.120	24.999	786.683	39848.709	33.157	11.761	26.883
L4	49.055	73.180	19298.049	16.272	23.804	810.709	39103.080	36.017	10.976	21.951
	57.975	89.355	35131.021	19.869	29.008	1211.080	71184.974	43.978	13.668	27.336

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 150.000-120.960				1	1	1		
L2 120.960-81.210				1	1	1		
L3 81.210-39.670				1	1	1		
L4 39.670-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	149.000 - 0.000	15	No Ice 1/2" Ice	0.660 0.660
(Sprint / Nextel)							
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	140.500 - 0.000	6	No Ice 1/2" Ice	0.820 0.820
(T-Mobile)							
VXL7-50 (1-5/8 FOAM)	C	No	Inside Pole	127.000 - 0.000	12	No Ice 1/2" Ice	0.750 0.750
(Verizon)							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
	ft		ft ²	ft ²	ft ²	ft ²	K
L1	150.000-120.960	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.428
L2	120.960-81.210	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.947

RISATower TowerCo, LLC 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	Job	CT2005	Page	3 of 6
	Project	100157.04	Date	10:16:59 09/22/10
	Client	TowerCo	Designed by	kingsley

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L3	81.210-39.670	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.989
L4	39.670-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.945

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.000-120.960	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.428
L2	120.960-81.210	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.947
L3	81.210-39.670	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.989
L4	39.670-0.000	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.945

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	A	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	B	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	C	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	A	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	B	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	C	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
PiROD 13' Low Profile Platform	C	None	0.000	0.000	149.083	No Ice	15.700	15.700	1.300
						1/2" Ice	20.100	20.100	1.765

RISATower TowerCo, LLC 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	Job		CT2005		Page		4 of 6	
	Project		100157.04		Date		10:16:59 09/22/10	
	Client		TowerCo		Designed by		kingsley	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _{Front} ft ²	C _A A _{Side} ft ²	Weight K
(Sprint/Nextel [Existing])								

RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	A	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	B	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	C	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
PiROD 4' Side Mount Standoff (1) (T-Mobile [Existing])	A	From Leg	2.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 4.910	2.720 4.910	0.050 0.089
PiROD 4' Side Mount Standoff (1) (T-Mobile [Existing])	B	From Leg	2.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 4.910	2.720 4.910	0.050 0.089
PiROD 4' Side Mount Standoff (1) (T-Mobile [Existing])	C	From Leg	2.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 4.910	2.720 4.910	0.050 0.089

(2) Antel LPA 80080/6 with Mount Pipe (Verizon [Proposed])	A	From Face	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 5.202	11.503 12.475	0.074 0.149
(2) Antel LPA-80063/6 w MP (Verizon [Proposed])	B	From Face	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 11.273	10.599 13.013	0.053 0.147
(2) Antel LPA 80080/6 with Mount Pipe (Verizon [Proposed])	A	From Face	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 4.761	9.216 9.823	0.025 0.075
BXA-185063/12CF_2 w/ MP (Verizon [Proposed])	A	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-185063/12CF_2 w/ MP (Verizon [Proposed])	B	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-185063/12CF_2 w/ MP (Verizon [Proposed])	C	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-70063/6CF_2 w/ MP (Verizon [Proposed])	A	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
BXA-70063/6CF_2 w/ MP (Verizon [Proposed])	B	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
BXA-70063/6CF_2 w/ MP (Verizon [Proposed])	C	From Leg	3.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
PiROD 13' Low Profile Platform (Verizon [Proposed])	A	None		0.000	127.000	No Ice 1/2" Ice 20.100	15.700 20.100	1.300 1.765

RISATower TowerCo, LLC 5000 Vallestone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	Job CT2005	Page 5 of 6
	Project 100157.04	Date 10:16:59 09/22/10
	Client TowerCo	Designed by kingsley

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P/P _a
	ft		ft	ft		ksi	in ²	K	K	
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	29.040	0.000	0.0	39.000	30.765	-35.581	1199.850	0.030
L2	120.96 - 81.21 (2)	TP39.99x30.262x0.375	44.250	0.000	0.0	39.000	46.375	-42.370	1808.630	0.023
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	47.040	0.000	0.0	39.000	65.353	-52.564	2548.780	0.021
L4	39.67 - 0 (4)	TP56x45.953x0.5	46.253	0.000	0.0	39.000	89.355	-68.369	3484.850	0.020

Pole Bending Design Data

Section No.	Elevation	Size	Actual M _x	Actual f _{bx}	Allow. F _{bx}	Ratio f _{bx} /F _{bx}	Actual M _y	Actual f _{by}	Allow. F _{by}	Ratio f _{by} /F _{by}
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	150.756	-7.885	39.000	0.202	0.000	0.000	39.000	0.000
L2	120.96 - 81.21 (2)	TP39.99x30.262x0.375	789.380	-21.795	39.000	0.559	0.000	0.000	39.000	0.000
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	1661.13	-26.934	39.000	0.691	0.000	0.000	39.000	0.000
L4	39.67 - 0 (4)	TP56x45.953x0.5	2905.35	-28.788	39.000	0.738	0.000	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation	Size	Ratio P/P _a	Ratio f _{bx} /F _{bx}	Ratio f _{by} /F _{by}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	0.030	0.202	0.000	0.232	1.333	H1-3 ✓
L2	120.96 - 81.21 (2)	TP39.99x30.262x0.375	0.023	0.559	0.000	0.582	1.333	H1-3 ✓
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	0.021	0.691	0.000	0.711	1.333	H1-3 ✓

RISATower TowerCo, LLC 5000 Valleystone Drive Cary, NC 27519 Phone: (919) 469 - 5559 FAX: (919) 469-5530	Job CT2005	Page 6 of 6
	Project 100157.04	Date 10:16:59 09/22/10
	Client TowerCo	Designed by kingsley

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
L4	39.67 - 0 (4)	TP56x45.953x0.5	0.020	0.738	0.000	0.758	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	150 - 120.96	Pole	TP31.99x24.871x0.313	1	-35.581	1599.400	17.4	Pass
L2	120.96 - 81.21	Pole	TP39.99x30.262x0.375	2	-42.370	2410.904	43.7	Pass
L3	81.21 - 39.67	Pole	TP48.26x38.031x0.438	3	-52.564	3397.524	53.4	Pass
L4	39.67 - 0	Pole	TP56x45.953x0.5	4	-68.369	4645.305	56.8	Pass
						Summary		
						Pole (L4)	56.8	Pass
						RATING =	56.8	Pass



FLANGE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input - M := 2905·kip·ft = moment at top of flange plate
 P := 68·kip = axial load (use zero if base plate is grouted)
 F_y := 60·ksi = yield stress of flange plate
 b_{eff} := 26.0625·in = effective width of flange plate in flexure
 t := 2.25·in = thickness of flange plate
 ASI := 133·% = allowable stress increase

CONSTANTS:
 psi ≡ $\frac{\text{lb}}{\text{in}^2}$
 ksi ≡ 1000·psi
 kip ≡ 1000·lb

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 2 \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad d := \begin{pmatrix} 2 \cdot 12 + 8 + \frac{1}{2} \\ 2 \cdot 12 + 7 + \frac{3}{8} \\ 2 \cdot 12 + 4 + \frac{1}{8} \\ 1 \cdot 12 + 11 \\ 1 \cdot 12 + 4 + \frac{1}{4} \\ 8 \cdot 12 + \frac{7}{16} \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in} \quad A_{\text{stiff}} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2$$

$$A_{\text{stress}} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2 \quad F_t := \begin{pmatrix} .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{ksi}$$

$$\sum(Q) = 24 \quad \text{sumQAd} := \sum(Q \cdot d^2 \cdot A_{\text{stiff}}) \quad \text{sumQAd} = 197357 \cdot \text{in}^4$$

$$R_w := \frac{M \cdot (d \cdot A_{\text{stiff}})}{\text{sumQAd}} + \frac{P \cdot A_{\text{stiff}}}{\sum(A_{\text{stiff}} \cdot Q)}$$

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

$$R = \begin{pmatrix} 25.7 \\ 24.9 \\ 22.6 \\ 19.0 \\ 14.3 \\ 70.6 \\ 2.8 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \quad f_t = \begin{pmatrix} 7.9 \\ 7.7 \\ 7.0 \\ 5.8 \\ 4.4 \\ 21.7 \\ 0.9 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{ksi} \quad r = \begin{pmatrix} 13 \\ 13 \\ 12 \\ 10 \\ 7 \\ 36 \\ 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners
 d = distance from center
 A = area of fastener
 Ft = allowable tension stress

$$m := \begin{pmatrix} 2 + \frac{3}{4} \\ 2 + \frac{1}{4} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in}$$

$$M_{PL} := \left[\left[\left(\frac{Q}{2} \right) \cdot R \cdot m \right] \right]$$

$$M_{PL} = \begin{pmatrix} 5.9 \\ 9.3 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \cdot \text{ft}$$

$$\sum M_{PL} = 182.6 \cdot \text{kip} \cdot \text{in}$$

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

$$f_b = 8.3 \cdot \text{ksi}$$

$$F'_b := \text{ASI} \cdot 0.75 \cdot F_y$$

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

$$r_b = 14.0\%$$



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

August 23, 2010

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

RE: **EM-VER-142-100802** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 208 Reed Road, Tolland, Connecticut.

Dear Attorney Baldwin:

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

The proposed modifications are to be implemented as specified here and in your notice dated August 2, 2010, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/CDM/laf

c: The Honorable Frederick M. Daniels, Chairman Town Council, Town of Tolland
Steven R. Werbner, Town Manager, Town of Tolland
Linda Farmer, Town Planner, Town of Tolland
Thomas J. Regan, Esq., Brown Rudnick LLP (o/b/a TowerCo)

EM-VER-142-100802

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

ORIGINAL

August 2, 2010

Via Hand Delivery

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



Re: **Notice of Exempt Modification
208 Reed Road, Tolland, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) intends to install antennas on the existing 150-foot self-supporting monopole tower owned by TowerCo, LLC. (“TowerCo”) at 208 Reed Road in Tolland, Connecticut. 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 Tolland Town Manager, Steven R. Werbner and Dale M. Clayton, Chair of the Tolland Town Council. A copy of this letter is also being sent to Reed Road Realty, the owner of the property on which the tower is located.



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www.rc.com

The facility consists of a 150-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 208 Reed Road in Tolland. The tower is currently shared by Nextel with antennas at the 149-foot level and T-Mobile with antennas at the 140.5-foot level on the tower. Cellco intends to install twelve (12) panel-type antennas at the 127-foot level on the tower and place a 12' x 24' equipment shelter and a 1000 gallon propane tank on the ground within a fenced compound. Attached behind Tab 1 are Project Plans for the proposed Cellco facility.

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

ROBINSON & COLE_{LLP}

S. Derek Phelps

August 2, 2010

Page 2

1. The proposed modification will not result in an increase to the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 127-foot level on the 150-foot tower.
2. The proposed installation of a 12' x 24' equipment shelter and propane tank will require an extension of the existing fenced compound but not extend beyond the existing the leased area.
3. The proposed installation will not increase the noise levels at the facility by six decibels or more.
4. The operation of the antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. The worst-case RF power density calculations for all existing and Cellco antennas would be 28.3% of the FCC standard. A copy of the cumulative power density calculations table is attached behind Tab 2.

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

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

Sincerely,



Kenneth C. Baldwin

Attachments

Copy to:

Steven R. Werbner, Tolland Town Manager
Reed Road Realty
Sandy M. Carter
Michelle Kababik



Cellco Partnership

d.b.a. **verizon**wireless WIRELESS COMMUNICATIONS FACILITY

TOLLAND 2, CT
208 REED ROAD
TOLLAND, CT 06084

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE EAST HARTFORD, CONNECTICUT **TO:** 208 REED ROAD TOLLAND, CT 06084

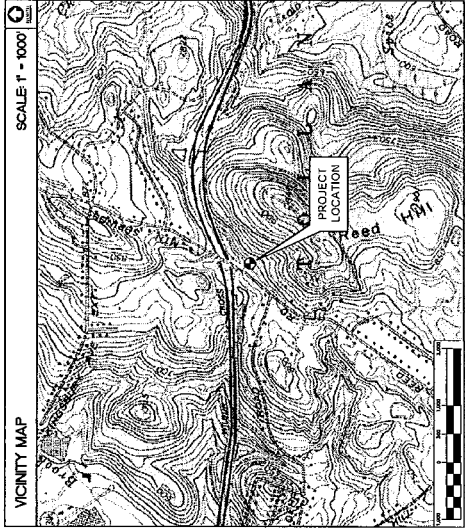
- START OUT GOING NORTHEAST ON E RIVER DRIVE
- MERGE ONTO I-84E VIA THE RAMP ON THE LEFT TOWARD CT-2 E/NORWICH 0.0 MI.
1.42 MI.
- TAKE THE CT-31 EXIT, EXIST 67, TOWARD ROCKVILLE/COVENTRY 0.2 MI.
- TURN RIGHT ONTO MILE HILL ROAD/CT-31/RESERVOIR ROAD. 0.2 MI.
- CONTINUE TO FOLLOW MILE HILL ROAD/CT-31.
- TURN LEFT ONTO BOGHER ROAD. 1.0 MI.
- TURN LEFT ONTO BOGHER ROAD ON THE RIGHT. 0.0 MI.
- ARRIVE AT 208 REED ROAD, ON THE RIGHT.

GENERAL NOTES

- PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELCO PARTNERSHIP.

PROJECT SCOPE

- THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 12'x24" PREFABRICATED WIRELESS EQUIPMENT SHELTER ON A CONCRETE FOUNDATION AND A 1,000 GALLON PROPANE TANK ON A CONCRETE PAD, LOCATED WITHIN THE EXISTING WIRELESS COMMUNICATIONS LEASE AREA.
- A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED ON AN EXISTING ±150' TALL MONOPOLE TOWER AT A CENTERLINE ELEVATION OF ±127' ABOVE THE TOWER BASE.
- ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND TO THE PROPOSED EQUIPMENT SHELTER FROM AN EXISTING UTILITY BACKBOARD LOCATED ADJACENT TO AN EXISTING EQUIPMENT SHELTER.



PROJECT SUMMARY	
SITE NAME:	TOLLAND 2, CT
SITE ADDRESS:	208 REED ROAD TOLLAND, CT 06084
LESSEE/TENANT:	CELCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELCO PARTNERSHIP (860) 803-8219
TOWER COORDINATES:	LATITUDE 41°-51'-11.78" LONGITUDE 72°-24'-21.89"
	COORDINATES ARE BASED ON CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX		
SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	A
C-1	COMPOUND PLAN AND ELEVATION	A

DESIGNED BY: CFC
DRAWN BY: TSP
CHK'D BY: DMD

CELLCO PARTNERSHIP
d.b.a. VERIZON WIRELESS

CELCO PARTNERSHIP
208 REED ROAD
TOLLAND, CT 06084

VERIZON WIRELESS COMMUNICATIONS FACILITY
TOLLAND 2, CT
TOLLAND, CT 06084

DATE: 07/29/10
SCALE: AS NOTED
JOB NO. 10017

TITLE SHEET
T-1

Sheet No. 1 of 2

REV.	DATE	BY	DESCRIPTION
A	07/29/10	TSP	ISSUED FOR CSC-CLIENT REVIEW

DESIGNED BY: CFC	TSP	DATE: 07/29/10	ISSUED FOR CSC-CLIENT REVIEW
DRAWN BY: DMD	CHK'D BY: DMD	DATE: 07/29/10	ISSUED FOR CSC-CLIENT REVIEW
REV: A	DATE: 07/29/10	DESCRIPTION: ISSUED FOR CSC-CLIENT REVIEW	

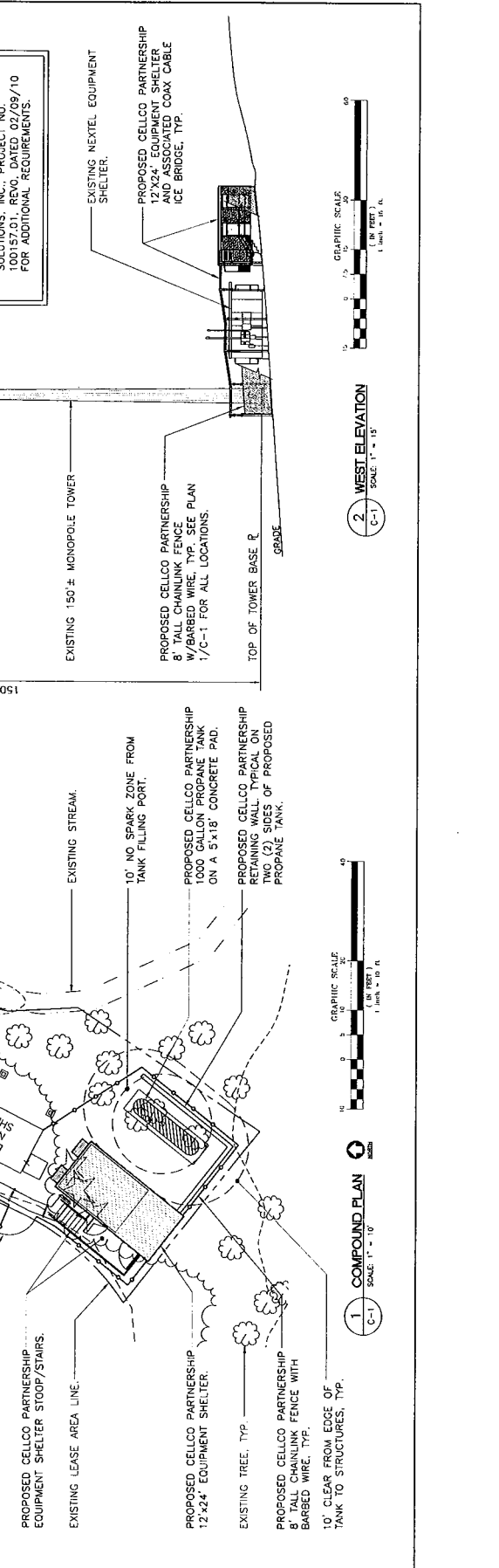
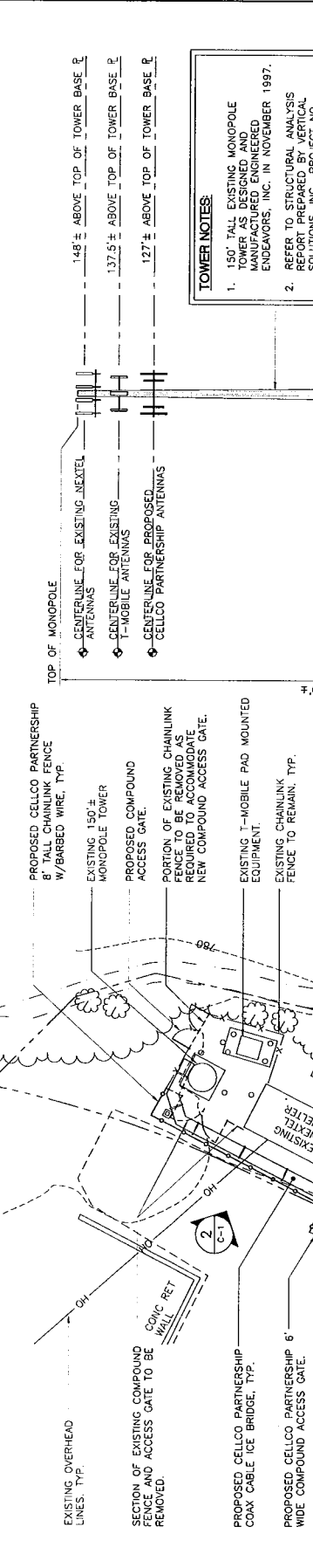
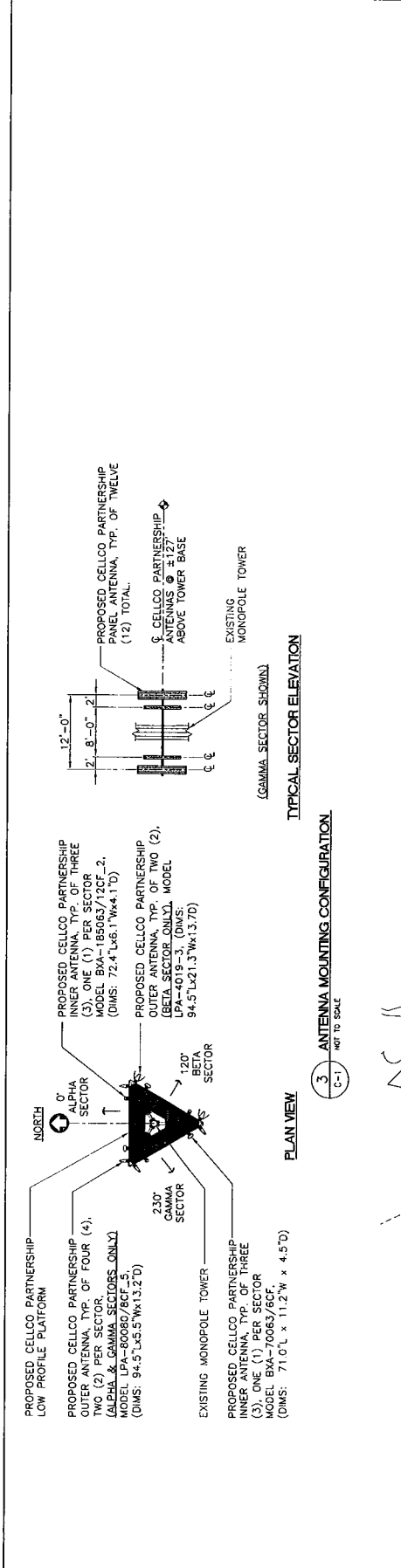
Cellco Partnership
d/b/a Verizon Wireless

Cellco Partnership
d/b/a Verizon Wireless
208 RED ROAD
TOLLAND, CT 06084

CELLCO PARTNERSHIP
WIRELESS COMMUNICATIONS FACILITY
TOLLAND 2, CT
TOLLAND, CT 06084

DATE: 07/04/10
SCALE: AS NOTED
JOB NO.: 10017

COMPOUND
PLAN AND
ELEVATION
C-1
Sheet No. 2 of 2



Site Name: Tolland 2 Tower Height: Verizon @ 127		General	Power	Density					
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	PERMISS. EXP.	FRACTION MPE	Total	
*Nextel	9	100	148	0.0148	851	0.5673	2.60%		
*T-Mobile	8	129.5	140	0.0190	1935	1.0000	1.90%		
Verizon	3	518	127	0.0346	1970	1.0000	3.46%		
Verizon	9	478	127	0.0959	869	0.5793	16.55%		
Verizon	1	853	127	0.0190	757	0.4973	3.82%		
									28.3%
* Source: Siting Council									



PASS
(Foundation, 79% capacity)



February 9, 2010

Ms. Catherine Godwin
TowerCo, LLC
5000 Vallestone 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, Collocation Site Number: N/A Site Name: Tolland 2
TowerCo Designation	Site Number: CT2005 Site Name: Tolland-Reed Road
Engineering Firm Designation	Vertical Solutions Project: 100157.01, Rev0
Site Data	207 Reed Road, Tolland, Tolland County, CT 06084 Latitude: N41° 51' 12.1"±; Longitude: W72° 24' 22.1"± Elevation: 780 ft±, Topography Category: 1; Exposure Category: "C"; Structure Class II; Site Class "E" 150-ft Self-Supporting Pole Structure (Monopole)

Dear Ms. Godwin,

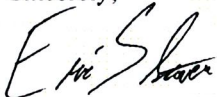
To your request, we present our structural analysis.

Our work indicates that with the proposed appurtenance configuration, the tower and foundation **will** satisfy the structural strength requirements of ANSI/TIA-222-F-1996, *Structural Standard for Antenna Supporting Structures and Antennas* (industry standard) and the *2003 International Building Code* (local building code) for:

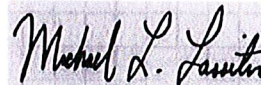
- 85-mph fastest mile basic wind speed
- 75-mph fastest mile basic wind speed with 1/2-in radial ice
- Earthquake design parameters and loading, per USGS Ground Motion Parameter Calculator and industry standard, respectively, including:
 - $S_s = 0.234$
 - $S_1 = 0.064$

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

Sincerely,



Eric S. Stover, E.I.
Structural Engineer in Training

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

FEB 09 2010

Table 1: Existing, Proposed and Reserved Appurtenance Configuration

Elevation (AGL, ft)	Carrier	Mount	Equipment	Coax	Location ²
149.08 ¹	Sprint/ Nextel	Low Profile Platform	(9) Decibel Db844H90E-XY (3) Kathrein AP11-880/090D/XP	(15) 1 1/4	Inside
140.5	T-Mobile	Side Arms	(3) EMS RR90-17-00DP	(6) 1 5/8	Inside
127	Verizon	Low Profile Platform	(4) Antel LPA-80080/8CF_5 (2) Antel LPA-4019 (3) Antel BXA-185063/12CF_2 (3) Antel BXA-70063/6CF	(12) 1 5/8	Inside ³

1 – Existing (current) equipment [EPA(A) = 73.5 sq ft] listed above and used in analysis. Tower Design loading was located within 2 feet of existing loading.

2 – See coax configuration plan, QP-for coax locations.

3 – Hand hole rim located within 5-ft of proposed loading

Table 2: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
150 to 120.96	18	O. K.	-	-
120.96 to 81.21	46	O. K.		
81.21 to 39.67	56	O. K.		
39.67 to 0	60	O. K.	32	O. K.

Table 3: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized	Result
Moment	4612 k-ft	3044 k-ft	66	O. K.
Shear	39 k	31 k	79	O. K.

Attachments:

- Project History
- Sheet QP-P, Coax configuration plan
- Program input and output- wind
- Sheet BPL, Base Plate Layout
- Base plate and anchor rod calculations

Project History, 100157.01 Tolland Reed Road_CT2005

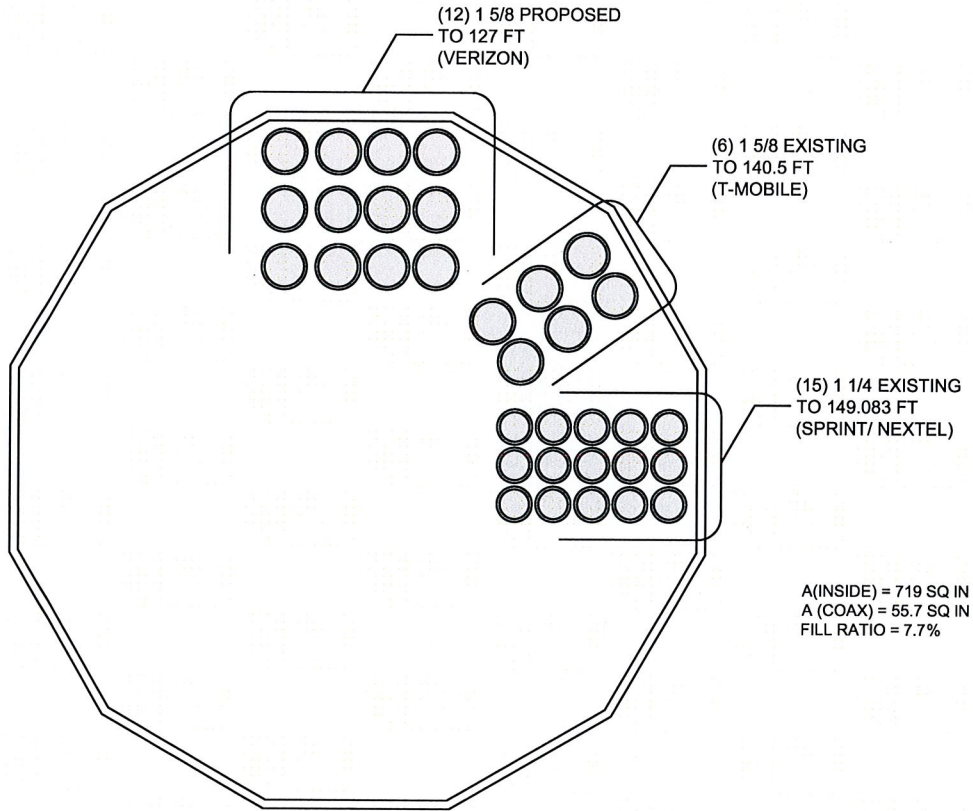
Design Documents						
TowerCo Document	Structure	Document ID	Issued Date	Issued By	Issued To	Description
197391	CT2005	19971126_TFDC_CT2005.pdf	11/26/1997	Engineered Endeavors Inc.	Nextel	Tower and Foundation Design Calculations
742213	CT2005	19971210_GEO_CT2005.pdf	12/10/1997	Applied Earth Technologies	Nextel	Geotechnical Investigation
711880	CT2005	20080923_SLA_CT2005.pdf	9/23/2008	Nextel	TowerCo	Site Lease Agreement
Collo Application tolland 2 1.doc	CT2005	20100128_CTA_CT2005.pdf	1/28/2010	Verizon	TowerCo	Co-location Tenant Application

Table Note:

Files name format YYYYMMDD-XXX-ZZZZZZ.pdf

Where:

YYYY=year
MM=month
DD=day published/issued
XXX=file describer
ZZZZZ=TowerCo Site ID



COAX CONFIGURATION PLAN AT 127.0-FT

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

DRAWN BY:	ESS	CHECKED BY:	ESS
SHEET NUMBER:	QP-P		
REVISION:	0		
VSI #:	100156.01		

REV	DATE
0	02/04/2010

PREPARED FOR:

5000 Valley Stone Drive
Cary, NC 27519
Office: (919) 489-5559
Fax: (919) 489-5530
www.towerco.com

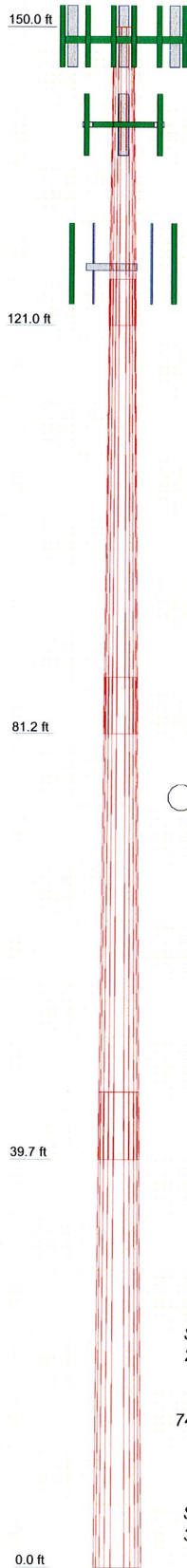
PROJECT NAME: **Pine Wood Lake**

TOWERCO JOB #: **MA2005**

PREPARED BY:

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768
www.verticalsolutions-inc.com

Section	1	2	3	4
Length (ft)	29.040	44.250	47.040	46.253
Number of Sides	12	12	12	12
Thickness (in)	0.313	0.375	0.438	0.500
Socket Length (ft)	4.500	5.500	6.583	45.953
Top Dia (in)	24.871	30.262	38.031	56.000
Bot Dia (in)	31.990	39.990	48.260	56.000
Grade			A572-65	
Weight (K)	2.8	6.3	9.6	12.8



DESIGNED APPURTENANCE LOADING

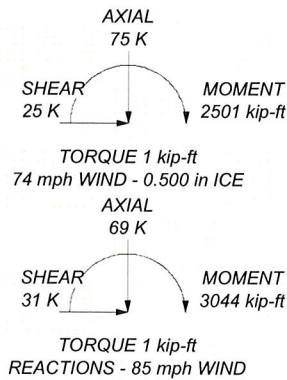
TYPE	ELEVATION	TYPE	ELEVATION
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	127
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	127
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	149.083	(2) LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	LPA-4019 w/Mount Pipe (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	LPA-4019 w/Mount Pipe (Verizon [Proposed])	127
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	149.083	BXA-185063/12CF w/ MP (Verizon [Proposed])	127
PIROD 13' Low Profile Platform (Sprint/Nextel [Existing])	149.083	BXA-185063/12CF w/ MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-185063/12CF w/ MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-70063/6CF w/ MP (Verizon [Proposed])	127
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	140.5	BXA-70063/6CF w/ MP (Verizon [Proposed])	127
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	140.5	BXA-70063/6CF w/ MP (Verizon [Proposed])	127
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	140.5	PIROD 13' Low Profile Platform (Verizon [Proposed])	127
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	140.5		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland 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.



Vertical Solutions, Inc. 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 469-1768		Job: CT2005
		Project: 100157.01
Client: TowerCo	Drawn by: estover	App'd:
Code: TIA/EIA-222-F	Date: 02/09/10	Scale: NTS
Path: L:\2010\157 Tolland-reed R0\Task 1\Models\100157.01.dwg		Dwg No. E-1

RISATower Vertical Solutions, Inc. 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 469-1768	Job	CT2005	Page	1 of 8
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	Client	TowerCo	Designed by	estover

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 Tolland County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.500 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

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

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	150.000-120.960	29.040	4.500	12	24.871	31.990	0.313	1.250	A572-65 (65 ksi)
L2	120.960-81.210	44.250	5.500	12	30.262	39.990	0.375	1.500	A572-65 (65 ksi)
L3	81.210-39.670	47.040	6.583	12	38.031	48.260	0.438	1.750	A572-65 (65 ksi)
L4	39.670-0.000	46.253		12	45.953	56.000	0.500	2.000	A572-65 (65 ksi)

RISATower Vertical Solutions, Inc. 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 469-1768	Job	CT2005	Page	2 of 8
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	Client	TowerCo	Designed by	estover

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	25.749	24.712	1902.480	8.792	12.883	147.669	3854.939	12.163	5.828	18.65
	33.118	31.875	4082.672	11.341	16.571	246.377	8272.601	15.688	7.736	24.755
L2	32.354	36.088	4114.493	10.700	15.676	262.476	8337.079	17.762	7.105	18.947
	41.401	47.835	9581.910	14.182	20.715	462.563	19415.547	23.543	9.712	25.9
L3	40.611	52.960	9553.297	13.458	19.700	484.939	19357.570	26.065	9.020	20.617
	49.962	67.370	19666.030	17.120	24.999	786.683	39848.709	33.157	11.761	26.883
L4	49.055	73.180	19298.049	16.272	23.804	810.709	39103.080	36.017	10.976	21.951
	57.975	89.355	35131.021	19.869	29.008	1211.080	71184.974	43.978	13.668	27.336

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in						
L1 150.000-120.960				1	1	1		
60 L2 120.960-81.210				1	1	1		
0 L3 81.210-39.670				1	1	1		
L4 39.670-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF6-50A (1-1/4 FOAM) (Sprint / Nextel)	C	No	Inside Pole	149.000 - 0.000	15	No Ice 1/2" Ice	0.000 0.000	0.660 0.660
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	No	Inside Pole	140.500 - 0.000	6	No Ice 1/2" Ice	0.000 0.000	0.820 0.820
VXL7-50 (1-5/8 FOAM) (Verizon)	C	No	Inside Pole	127.000 - 0.000	12	No Ice 1/2" Ice	0.000 0.000	0.750 0.750

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.000-120.960	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.428
L2	120.960-81.210	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.947

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	Client	TowerCo	Designed by	estover

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L3	81.210-39.670	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.989
L4	39.670-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.945

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.000-120.960	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.428
L2	120.960-81.210	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.947
L3	81.210-39.670	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.989
L4	39.670-0.000	A	0.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.945

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	A	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
			0.000						
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	B	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
			0.000						
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel [Existing])	C	From Leg	3.000	0.000	149.083	No Ice	3.579	5.396	0.036
			0.000			1/2" Ice	4.201	6.491	0.077
			0.000						
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	A	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
			0.000						
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	B	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
			0.000						
Kathrein AP11-880/090/XP w MP (Sprint/Nextel [Existing])	C	From Leg	3.000	0.000	149.083	No Ice	7.867	5.854	0.063
			0.000			1/2" Ice	8.429	7.046	0.120
			0.000						
PiROD 13' Low Profile Platform	C	None	0.000	0.000	149.083	No Ice	15.700	15.700	1.300
						1/2" Ice	20.100	20.100	1.765

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	Client	TowerCo	Designed by	estover

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
(Sprint/Nextel [Existing]) *** ***								
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	A	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	B	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
RR90-17-00DP w/Mount Pipe (T-Mobile [Existing])	C	From Leg	3.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 5.572	3.636 4.703	0.044 0.082
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	A	From Leg	0.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 6.265	0.350 0.432	0.152 0.194
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	B	From Leg	0.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 6.265	0.350 0.432	0.152 0.194
TS6x6x0.25 x 96" SA (T-Mobile [Existing])	C	From Leg	0.000 0.000 0.000	0.000	140.500	No Ice 1/2" Ice 6.265	0.350 0.432	0.152 0.194
*** *** *** *** ***								

LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	A	From Face	2.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 6.894	14.073 15.558	0.053 0.134
LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	B	From Face	2.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 6.894	14.073 15.558	0.053 0.134
(2) LPA-80080/8CF w/Mount Pipe (Verizon [Proposed])	C	From Face	2.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 6.894	14.073 15.558	0.053 0.134
LPA-4019 w/Mount Pipe (Verizon [Proposed])	A	From Face	2.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 20.321	14.441 15.974	0.097 0.175
LPA-4019 w/Mount Pipe (Verizon [Proposed])	B	From Face	2.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 20.321	14.441 15.974	0.097 0.175
BXA-185063/12CF w/ MP (Verizon [Proposed])	A	None		0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-185063/12CF w/ MP (Verizon [Proposed])	B	None		0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-185063/12CF w/ MP (Verizon [Proposed])	C	None		0.000	127.000	No Ice 1/2" Ice 3.539	2.982 3.589	0.028 0.057
BXA-70063/6CF w/ MP (Verizon [Proposed])	A	None		0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
BXA-70063/6CF w/ MP (Verizon [Proposed])	B	None		0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
BXA-70063/6CF w/ MP (Verizon [Proposed])	C	None		0.000	127.000	No Ice 1/2" Ice 5.860	3.628 4.237	9.918 9.958
PiROD 13' Low Profile Platform (Verizon [Proposed])	A	From Face	0.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 20.100	15.700 20.100	1.300 1.765

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120.96	27.814	36	1.517	0.002
L2	125.46 - 81.21	20.135	36	1.447	0.002
L3	86.71 - 39.67	9.728	36	1.055	0.001
L4	46.253 - 0	2.789	36	0.545	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.083	(3) DB844H90E-XY w/Mount Pipe	36	27.522	1.516	0.002	110865
140.500	RR90-17-00DP w/Mount Pipe	36	24.798	1.501	0.002	23340
127.000	LPA-80080/8CF w/Mount Pipe	36	20.602	1.456	0.002	9640

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120.96	55.712	11	3.038	0.004
L2	125.46 - 81.21	40.341	11	2.898	0.004
L3	86.71 - 39.67	19.497	11	2.113	0.002
L4	46.253 - 0	5.591	11	1.093	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.083	(3) DB844H90E-XY w/Mount Pipe	11	55.127	3.035	0.004	55775
140.500	RR90-17-00DP w/Mount Pipe	11	49.674	3.006	0.004	11741
127.000	LPA-80080/8CF w/Mount Pipe	11	41.275	2.915	0.004	4849

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 P P _a
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	29.040	0.000	0.0	39.000	30.765	-35.913	1199.850	0.030
L2	120.96 - 81.21	TP39.99x30.262x0.375	44.250	0.000	0.0	39.000	46.375	-42.702	1808.630	0.024

RISATower Vertical Solutions, Inc. 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 469-1768	Job	CT2005	Page	7 of 8
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Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
	(2)									
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	47.040	0.000	0.0	39.000	65.353	-52.929	2548.780	0.021
L4	39.67 - 0 (4)	TP56x45.953x0.5	46.253	0.000	0.0	39.000	89.355	-68.775	3484.850	0.020

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	154.436	-8.077	39.000	0.207	0.000	0.000	39.000	0.000
L2	120.96 - 81.21 (2)	TP39.99x30.262x0.375	836.083	-23.084	39.000	0.592	0.000	0.000	39.000	0.000
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	1751.65 8	-28.402	39.000	0.728	0.000	0.000	39.000	0.000
L4	39.67 - 0 (4)	TP56x45.953x0.5	3043.81 7	-30.160	39.000	0.773	0.000	0.000	39.000	0.000

Pole Interaction Design Data

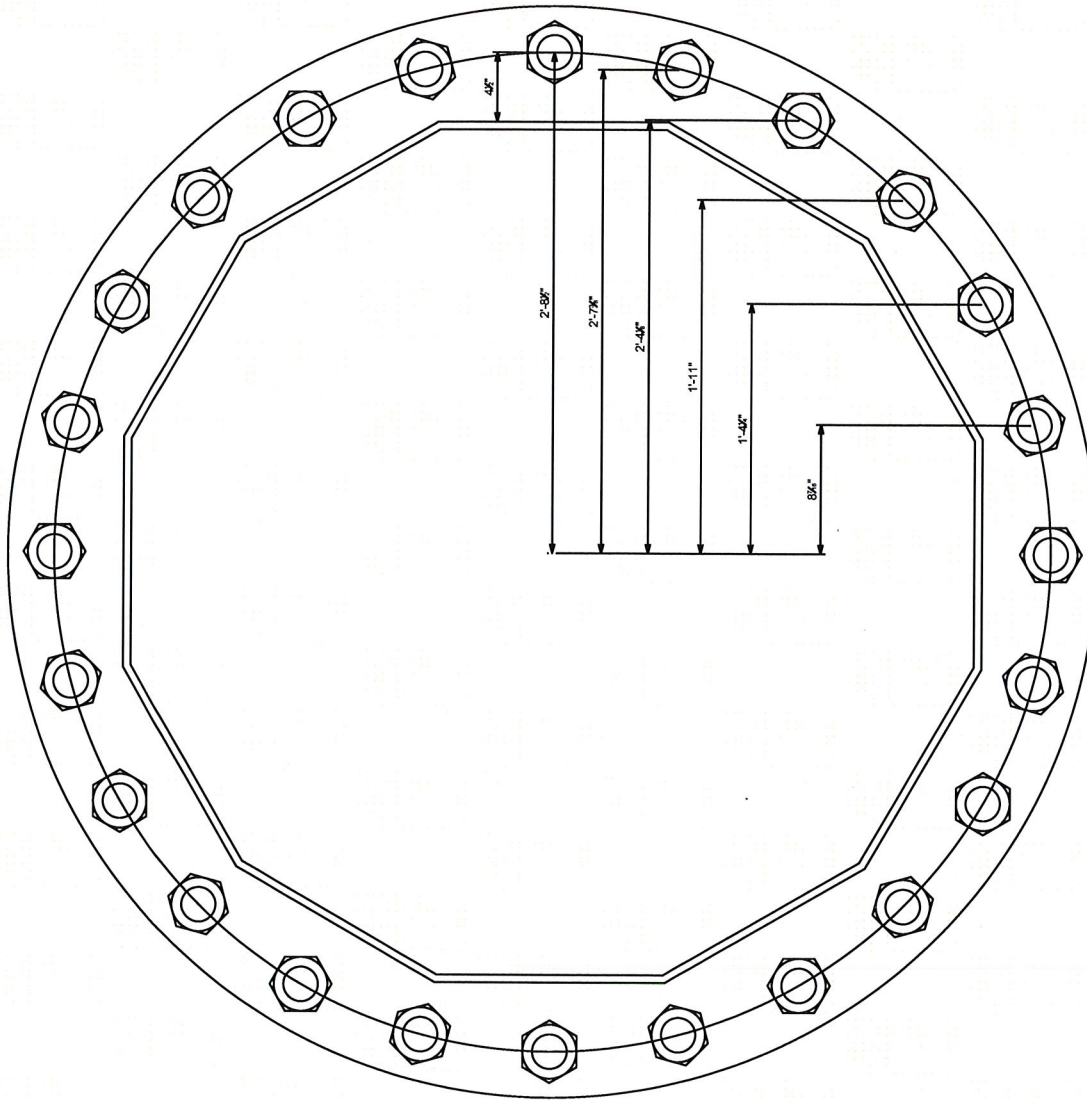
Section No.	Elevation ft	Size	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120.96 (1)	TP31.99x24.871x0.313	0.030	0.207	0.000	0.237	1.333	H1-3 ✓
L2	120.96 - 81.21 (2)	TP39.99x30.262x0.375	0.024	0.592	0.000	0.616	1.333	H1-3 ✓
L3	81.21 - 39.67 (3)	TP48.26x38.031x0.438	0.021	0.728	0.000	0.749	1.333	H1-3 ✓
L4	39.67 - 0 (4)	TP56x45.953x0.5	0.020	0.773	0.000	0.793	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	150 - 120.96	Pole	TP31.99x24.871x0.313	1	-35.913	1599.400	17.8	Pass
L2	120.96 - 81.21	Pole	TP39.99x30.262x0.375	2	-42.702	2410.904	46.2	Pass
L3	81.21 - 39.67	Pole	TP48.26x38.031x0.438	3	-52.929	3397.524	56.2	Pass
L4	39.67 - 0	Pole	TP56x45.953x0.5	4	-68.775	4645.305	59.5	Pass
Summary								
Pole (L4)							59.5	Pass
RATING =							59.5	Pass

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BASE PLATE

SCALE: 1" = 1'-0"

PREPARED BY:  2002 Production Drive Apex, NC 27539 Office: (888) 321-5167 Fax: (919) 321-1768 www.verticalsolutions-inc.com	PROJECT NAME: Pine Wood Lake TOWERCO JOB #: MA2005		PREPARED FOR:  5000 Valley Stone Drive Cary, NC 27519 Office: (919) 469-5559 Fax: (919) 469-5530 www.towerco.com		DRAWN BY: ESS CHECKED BY: ESS
	SHEET NUMBER: BLP	REVISION: 0	REV 0	DATE 02/04/2010	VSI #: 100156.01

FLANGE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input - M := 3044·kip·ft = moment at top of flange plate
 P := 69·kip = axial load (use zero if base plate is grouted)
 F_y := 60·ksi = yield stress of flange plate
 b_{eff} := 7.5·in = effective width of flange plate in flexure
 t := 2.25·in = thickness of flange plate
 ASI := 133.% = allowable stress increase

CONSTANTS:

psi ≡ $\frac{\text{lb}}{\text{in}^2}$
 ksi ≡ 1000·psi
 kip ≡ 1000·lb

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 2 \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad d := \begin{pmatrix} 2 \cdot 12 + 8 + \frac{1}{2} \\ 2 \cdot 12 + 7 + \frac{3}{8} \\ 2 \cdot 12 + 4 + \frac{1}{8} \\ 1 \cdot 12 + 11 \\ 1 \cdot 12 + 4 + \frac{1}{4} \\ 8 \cdot 12 + \frac{7}{16} \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in} \quad A_{\text{stiff}} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in}^2$$

$$A_{\text{stress}} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in}^2 \quad F_t := \begin{pmatrix} .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ .6 \cdot 75 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{ksi}$$

$$\sum(Q) = 24 \quad \text{sumQAd} := \sum(Q \cdot d^2 \cdot A_{\text{stiff}}) \quad \text{sumQAd} = 197357 \cdot \text{in}^4$$

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

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

$$R = \begin{pmatrix} 26.8 \\ 26.0 \\ 23.6 \\ 19.8 \\ 14.8 \\ 73.9 \\ 2.9 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \quad f_t = \begin{pmatrix} 8.3 \\ 8.0 \\ 7.3 \\ 6.1 \\ 4.6 \\ 22.7 \\ 0.9 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{ksi} \quad r = \begin{pmatrix} 14 \\ 13 \\ 12 \\ 10 \\ 8 \\ 38 \\ 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners
 d = distance from center
 A = area of fastener
 Ft = allowable tension stress

$$m := \begin{pmatrix} 4.5 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in}$$

$$M_{PL} := \left[\left[\left(\frac{Q}{2} \right) \cdot R \cdot m \right] \right]$$

$$M_{PL} = \begin{pmatrix} 10.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \cdot \text{ft}$$

$$\sum M_{PL} = 120.7 \cdot \text{kip} \cdot \text{in}$$

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

$$f_b = 19.1 \cdot \text{ksi}$$

$$F'_b := \text{ASI} \cdot 0.75 \cdot F_y$$

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

$$r_b = 32\%$$
