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@po.state.ct.us
www.ct.gov/csc

August 25, 2005

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

RE: **EM-VER-097-050713** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 151 Berkshire Road, Newtown, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on August 24, 2005, the Connecticut Siting Council (Council) acknowledged 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 July 13, 2005, 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,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: The Honorable Herbert C. Rosenthal, First Selectman, Town of Newtown
Gary Frenette, Zoning Enforcement Officer, Town of Newtown
Keith Coppins, Vice President of Development, Optasite, Inc.
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels, LLP
Christine Farrell, T-Mobile USA

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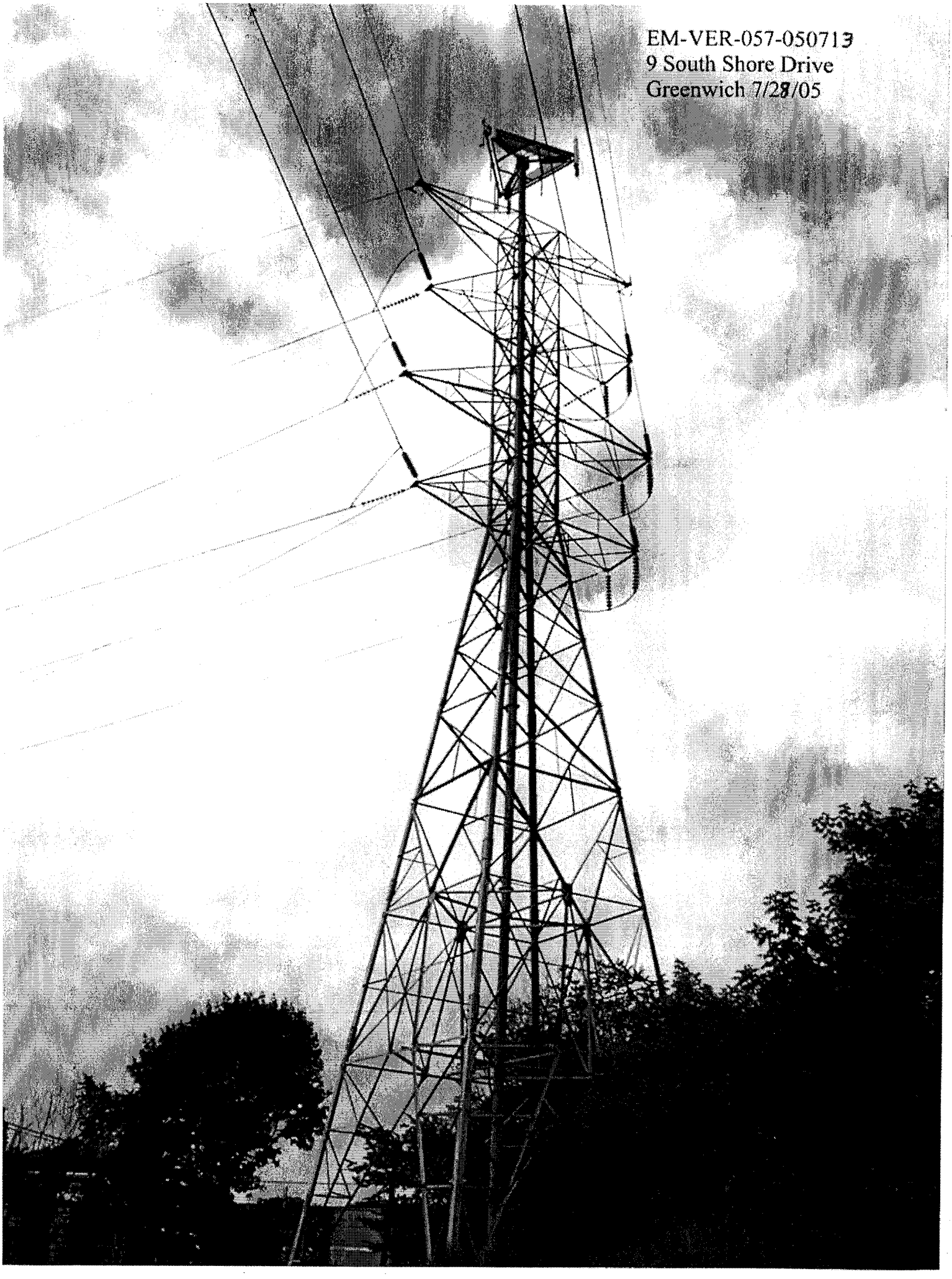
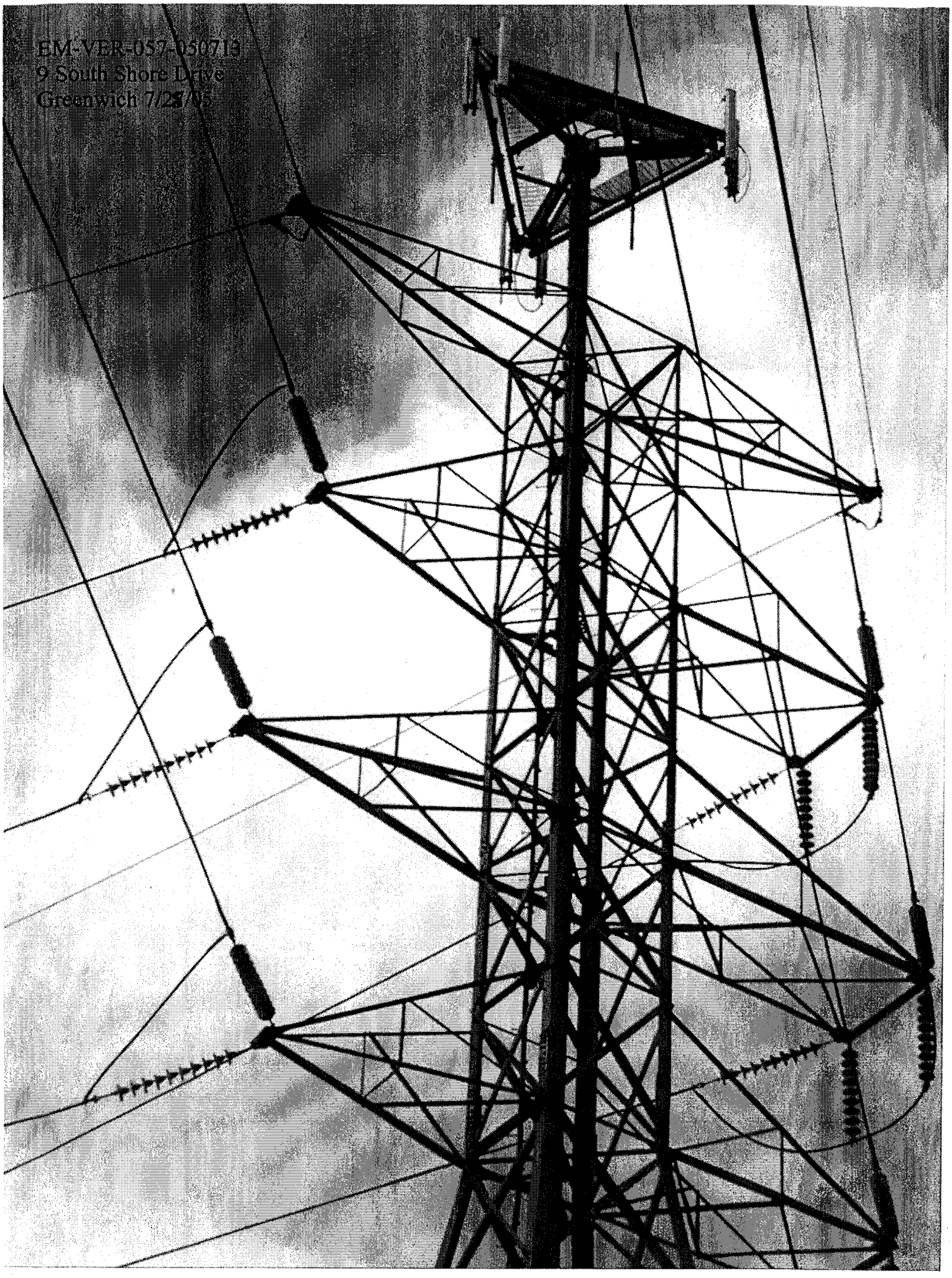
CSC
CONNECTICUT SITING COUNCIL


EM-VER-057-050713
9 South Shore Drive
Greenwich 7/28/05


EM-VER-057-050713
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9 South Shore Drive
Greenwich 7/28/05

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

EM-VER-097-050713

July 13, 2005

Via Hand Delivery

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

Re: **Notice of Exempt Modification**
151 Berkshire Road
Newtown, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on the existing 150-foot monopole tower owned by Optasite, Inc. at 151 Berkshire Road in Newtown, 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 First Selectman, Herbert C. Rosenthal.

The facility consists of a 150-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at the 151 Berkshire Road in Newtown. The tower is currently shared by the Town at the top level; AT&T at the 117.5-foot level; Sprint at the 107.5-foot level; and T-Mobile at the 97.5-foot level. Cellco proposes to install twelve (12) panel-type antennas at the 137.5-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced site compound. Attached behind Tab 1 are Project Plans for the proposed Cellco facility.

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 137.5-foot level on the 150-foot tower.

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

3. The proposed antenna modification 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 the proposed Cellco antennas would be 7.66% of the FCC standard. A copy of the general power density calculations table is attached behind Tab 2.

Also attached, behind Tab 3, is a structural analysis confirming that the tower can support the existing and proposed 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

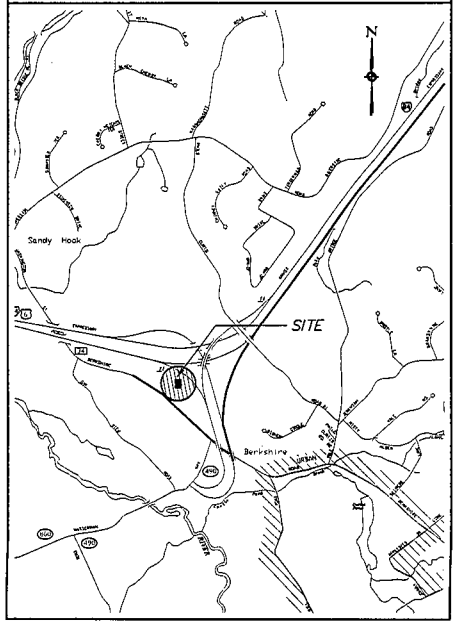
Attachments
cc: Herbert C. Rosenthal, First Selectman
Sandy M. Carter

CELLCO PARTNERSHIP
DBA
verizon wireless

NEWTOWN SOUTHEAST

151 BERKSHIRE ROAD
NEWTOWN, CONNECTICUT

VICINITY MAP — NO SCALE



PROJECT SUMMARY

SITE NAME:	NEWTOWN SOUTHEAST
SITE ADDRESS:	151 BERKSHIRE ROAD NEWTOWN, CONNECTICUT
CONTACT PERSON:	CELLCO PARTNERSHIP DBA VERIZON WIRELESS SANDY CARTER (860) 803-8219
GOVERNING CODE:	CONNECTICUT STATE BUILDING AND LIFE SAFETY CODE
APPLICANT:	CELLCO PARTNERSHIP DBA VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
ARCHITECT:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE ROCKY HILL, CT 06067
SURVEY:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE ROCKY HILL, CT 06067

LEGEND

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

ABBREVIATIONS

MIN.	MINIMUM
V.I.F.	VERIFY IN FIELD
O.C.	ON CENTER
PSF	POUND/SQUARE FOOT
TYP.	TYPICAL
TOC	TOP OF CONCRETE
TOW	TOP OF WALL

SHEET INDEX

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET – GENERAL NOTES AND LEGENDS
SC-1	SITE PLAN AND TOWER ELEVATION

verizon wireless

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

A&E SEAL

PROJECT NO: 36930803
JOB NO: VZ-146
DRAWN BY: RRH
CHECKED BY:

ISSUED FOR

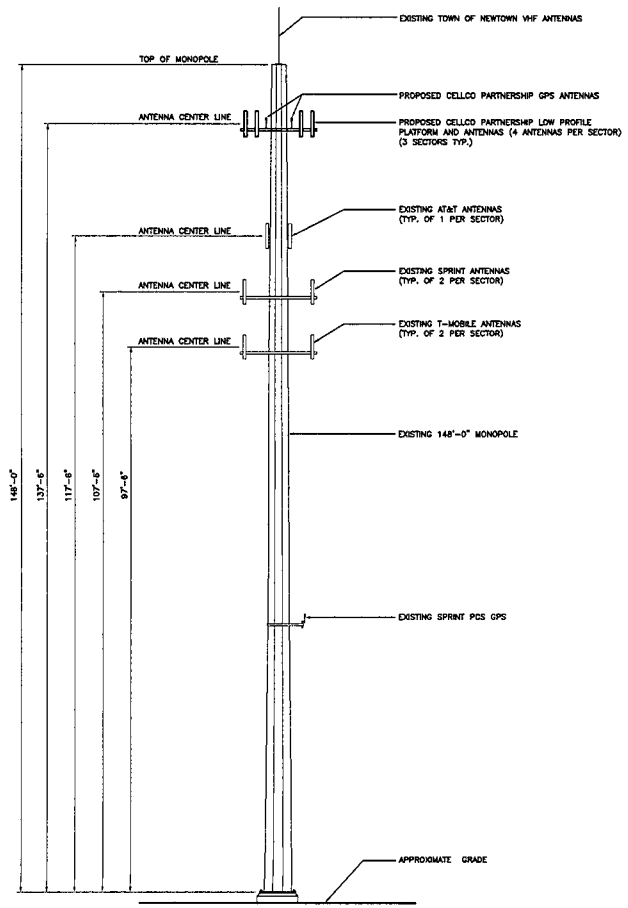
05-18-05	REVIEW
05-27-05	SITING COUNCIL

NEWTOWN SOUTHEAST
151 BERKSHIRE ROAD
NEWTOWN, CONNECTICUT

SCALE: AS NOTED

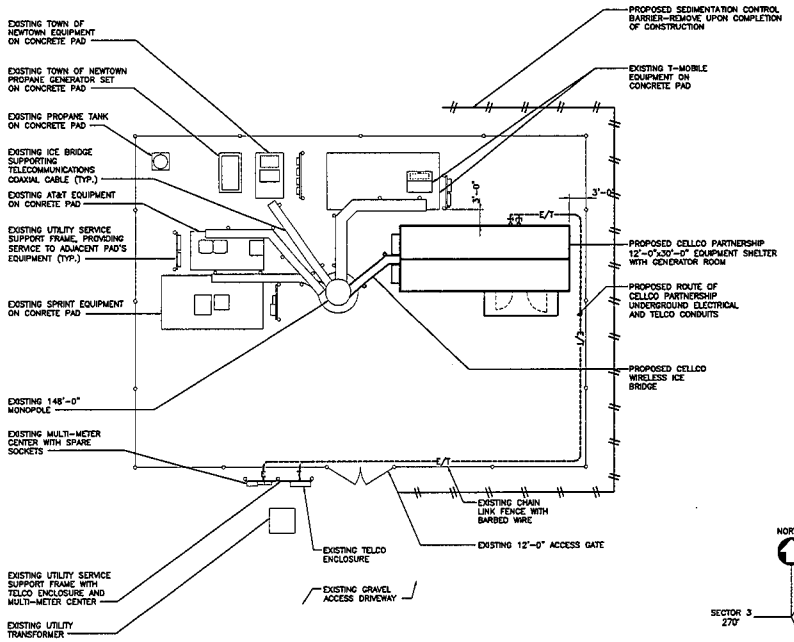
TITLE SHEET-
GENERAL NOTES
AND LEGEND

T-1



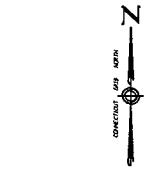
2 SC-1 TOWER ELEVATION
SCALE: 1"=10'-0"

0 5 10 20 30



1 SC-1 COMPOUND PLAN
SCALE: 1"=10'-0"

0 5 10 20 30



ANTENNA ORIENTATION KEY

verizon wireless

A&E FIRM
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
1-(860)-529-5882

A&E SEAL

PROJECT NO: 36930803
JOB NO: VZ-146
DRAWN BY: CRS
CHECKED BY:

ISSUED FOR	
05-18-05	REVIEW
05-27-05	SITING COUNCIL

NEWTOWN SOUTHEAST

151 BERKSHIRE ROAD
NEWTOWN, CONNECTICUT

SCALE: AS NOTED

SITE PLAN AND TOWER ELEVATION

SC-1

General Power Density

Site Name: Newtown Southeast, CT
Tower Height: 137.5 Ft. rad center

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
Verizon	880	9	200	1800	137.5	0.0342	0.56733	6.03%
Verizon	1900	3	285	855	137.5	0.0163	1	1.63%
Total Percentage of Maximum Permissible Exposure								7.66%

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

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

Absolute worst case scenario, maximum values used.

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 148' MONOPOLE FOR NEW ANTENNA ARRANGEMENT

151 Berkshire Road
Newtown, Connecticut

prepared for

Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36930808.00000
VZ1-146

May 10, 2005

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 148' steel monopole structure located at 151 Berkshire Rd in Newtown, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 85 mph and 74 mph concurrent with ½" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined on the Introduction of this report. The proposed Verizon Wireless additions are listed below:

(6) Antel LPA80080/4CF and (6) Antel LPA185080/8CF_2 antennas mounted on a new low-profile platform with (12) 1 5/8" coax cables within the monopole	Verizon Wireless (proposed)	@ 137.5' elevation

The results of the analysis indicate the steel monopole structure is in compliance with the proposed loading conditions. **The steel monopole structure is structurally adequate under the TIA/EIA-222-F wind load classification specified above and the existing and proposed antenna loadings.**

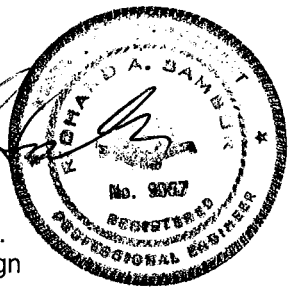
This analysis was based on:

1. The tower structure's capacity not including any assessment of the condition of the tower.
2. Tower geometry and member sizes taken from original construction drawings and structural calculations prepared by Paul J. Ford and Company, signed and stamped April 22, 2003.
3. Antenna inventory as specified in section 2 of this report.

This report is only valid per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumptions of the antenna and mount configurations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

Should you have any questions, please contact us.

Sincerely,
URS Corporation AES



Richard A. Sambor, P.E.
Manager Facilities Design

RAS/jek

cc: Alitz Abadjian – URS
CF/Book

2. INTRODUCTION

A structural analysis of the existing 148' steel monopole located at 151 Berkshire Rd in Newtown, Connecticut was performed by URS Corporation AES (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the monopole and foundation with its existing and proposed antenna loads.

The structure is self-supporting and was designed by Paul J. Ford and Company and manufactured by PennSummit Tubular, LLC. The tower geometry and member sizes taken from original construction drawings and structural calculations prepared by Paul J. Ford and Company, signed and stamped April 22, 2003.

The existing structure supports several communication antennas. The inventory is summarized below:

Antenna Type	***Carrier***	***Mount***	***Antenna Centerline Elevation***	***Cable***
(1) DB-222	Town (existing)	side arm mount	153'	(1) 7/8" coax cable (within monopole)
(1) 1 bay dipole	Town (existing)	side arm mount (listed above)	148'	(1) 7/8" coax cable (within monopole)
(6) Antel LPA185080/8CF_2	**Verizon (proposed)**	**13' low-profile platform (Valmont p/n 852208)**	**137.5'**	**(6) 1 5/8" coax cables (within monopole)**
(6) Antel LPA80080/8CF	**Verizon (proposed)**	**low-profile platform (listed above)**	**137.5'**	**(6) 1 5/8" coax cables (within monopole)**
(3) Allgon 7250.03	AT&T (existing)	Flush mount	117.5'	(6) 1 5/8" coax cables (within monopole)
(9) Allgon 7250.03	AT&T (future)	low-profile platform (to replace existing flush mount)	117.5'	(18) 1 5/8" coax cables (within monopole)
(6) Decibel DB980F90E-M	Sprint (existing)	low-profile platform	107.5'	(6) 1 1/4" coax cables (within monopole)
(6) Decibel DB980F90E-M	Sprint (future)	low-profile platform (listed above)	107.5'	(6) 1 1/4" coax cables (within monopole)
(6) EMS DR65-18-02DPL2	T-Mobile (existing)	low-profile platform	97.5'	(12) 1 1/4" coax cables (within monopole)
(6) EMS DR65-18-02DPL2	T-Mobile (future)	low-profile platform (listed above)	97.5'	(12) 1 1/4" coax cables (within monopole)
(1) GPS	Sprint (existing)	side arm mount	50'	(1) 1/2" coax cable (outside the monopole)

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with TIA/EIA-222-F, Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction, Allowable Stress Design (ASD).

The analysis was conducted using ERI Tower 3.0. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 85 mph Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 74 mph Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the monopole members were increased by one-third.

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the steel monopole structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were below the allowable stresses. Detailed analysis and calculations for the proposed antenna arrangement and load condition are provided in section 6 of this report. No further analysis was conducted on the foundation since the shear and moment at the top of the foundation were below the original design.

5. CONCLUSIONS

The results of the analysis indicate the steel monopole structure is in compliance with the proposed loading conditions. **The steel monopole structure is structurally adequate under the TIA/EIA-222-F wind load classification specified above and the existing and proposed antenna loadings.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed within the monopole.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

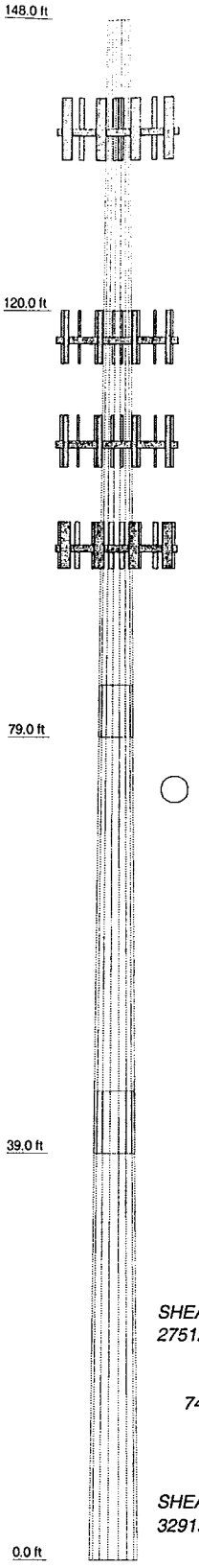
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

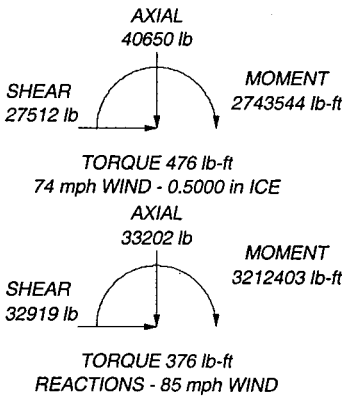
The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

ERI TOWER INPUT/OUTPUT SUMMARY

Section	4	3	2	1
Length (ft)	45.00	41.00	28.00	
Number of Sides	18	16	18	
Thickness (in)	0.3750	0.3125	0.2500	0.1875
Lap Splice (ft)		6.00	5.00	
Top Dia (in)	45.9879	38.4289	31.3750	25.5000
Bot Dia (in)	55.4300	47.8720	39.9780	31.3750
Grade	A572-65			
Weight (lb)	9173.7	6539.1	3941.6	1601.8
				21256.2





APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
DB222 (Town)	153	(4) 7250.03 w/Mount Pipe (ATT)	117.5
1-Bay Dipole	148	14' Low Profile Platform (ATT)	117.5
PiROD 13' Low Profile Platform (Verizon)	137.5	(4) DB980F90E-M w/Mount Pipe (Sprint)	107.5
(2) LPA-185080/8CFx2 w/Mount Pipe (Verizon)	137.5	(4) DB980F90E-M w/Mount Pipe (Sprint)	107.5
(2) LPA-80080/8CF w/Mount Pipe (Verizon)	137.5	(4) DB980F90E-M w/Mount Pipe (Sprint)	107.5
(2) LPA-185080/8CFx2 w/Mount Pipe (Verizon)	137.5	14' Low Profile Platform (Sprint)	107.5
(2) LPA-80080/8CF w/Mount Pipe (Verizon)	137.5	(4) DR65-18-02DPL2Q w/Mount Pipe (T-Mobile)	97.5
(2) LPA-185080/8CFx2 w/Mount Pipe (Verizon)	137.5	(4) DR65-18-02DPL2Q w/Mount Pipe (T-Mobile)	97.5
(2) LPA-80080/8CF w/Mount Pipe (Verizon)	137.5	(4) DR65-18-02DPL2Q w/Mount Pipe (T-Mobile)	97.5
(4) 7250.03 w/Mount Pipe (ATT)	117.5	14' Low Profile Platform (T-Mobile)	97.5
(4) 7250.03 w/Mount Pipe (ATT)	117.5	GPS (Sprint)	50

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 50 mph wind.
5. TOWER RATING: 85.3%

URS Corp. AES
500 Enterprise Dr, Suite 3B
Rocky Hill, CT 06067
Phone: (860) 529-8882
FAX: (860) 529-5566

Job: **148' Monopole**			
Project: **151 Berkshire Rd, Newtown, CT**			
Client: Verizon Wirless	Drawn by: Jed Kiernan	App'd:	
Code: TIA/EIA-222-F	Date: 05/10/05	Scale: NTS	
Path: P:\Structural\ERI Files\Newtown148' en		Dwg No. E-	

ERI TOWER DETAILED OUTPUT

ERITower	Job	Page
URS Corp. AES 500 Enterprise Dr, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	148' Monopole	1 of 17
	Project 151 Berkshire Rd, Newtown, CT	Date 12:58:08 05/10/05
	Client Verizon Wirless	Designed by Jed Kiernan

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 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	Use Azimuth Dish Coefficients	Consider Feedline Torque
Use Special Wind Profile	Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	148.00-120.00	28.00	0.00	18	25.5000	31.3750	0.1875	0.7500	A572-65 (65 ksi)
L2	120.00-79.00	41.00	5.00	16	31.3750	39.9780	0.2500	1.0000	A572-65 (65 ksi)
L3	79.00-39.00	45.00	6.00	16	38.4289	47.8720	0.3125	1.2500	A572-65 (65 ksi)
L4	39.00-0.00	45.00		18	45.9879	55.4300	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	25.8934	15.0641	1219.4128	8.9859	12.9540	94.1341	2440.4302	7.5335	4.1580	22.176
	31.8590	18.5605	2280.8007	11.0716	15.9385	143.1001	4564.6025	9.2820	5.1920	27.691
L2	31.9897	24.8222	3037.8976	11.0805	16.0012	189.8538	6121.7927	12.2733	5.7461	22.985
	40.7612	31.6831	6317.3532	14.1432	20.3888	309.8446	12730.3589	15.6656	7.4581	29.832
L3	40.2515	37.9972	6974.1153	13.5694	19.5987	355.8455	14053.8272	18.7876	7.0255	22.481
	48.8099	47.4109	13547.7417	16.9312	24.4147	554.9006	27300.6127	23.4422	8.9047	28.495
L4	47.9757	54.2908	14270.4969	16.1926	23.3619	610.8459	28559.7712	27.1505	7.4339	19.824
	56.2851	65.5292	25093.7716	19.5445	28.1584	891.1634	50220.5623	32.7708	9.0957	24.255

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 148.00-120.00				1	1	1		
L2 120.00-79.00				1	1	1		
L3 79.00-39.00				1	1	1		
L4 39.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8 (Town)	C	No	Inside Pole	148.00 - 0.00	2	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1 5/8 (Verizon)	C	No	Inside Pole	137.50 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (ATT)	C	No	Inside Pole	117.50 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 1/4 (Sprint)	C	No	Inside Pole	107.50 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
1 1/4 (T-Mobile)	C	No	Inside Pole	97.50 - 0.00	24	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
1/2 (Sprint)	C	No	CaAa (Out Of Face)	50.00 - 0.00	1	No Ice	0.06	0.25
						1/2" Ice	0.16	0.91

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 lb
L1	148.00-120.00	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	248.64
L2	120.00-79.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1555.20

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 lb
L3	79.00-39.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.638	1994.75
L4	39.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.262	1951.95

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 lb
L1	148.00-120.00	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	248.64
L2	120.00-79.00	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	1555.20
L3	79.00-39.00	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	1.738	2002.01
L4	39.00-0.00	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	6.162	1977.69

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 lb
PiROD 13' Low Profile Platform (Verizon)	C	None			0.0000	137.50	No Ice	15.70	15.70	1300.00
							1/2" Ice	20.10	20.10	1765.00
14' Low Profile Platform (ATT)	C	None			0.0000	117.50	No Ice	19.50	19.50	950.00
							1/2" Ice	28.40	28.40	1300.00
14' Low Profile Platform (Sprint)	C	None			0.0000	107.50	No Ice	19.50	19.50	950.00
							1/2" Ice	28.40	28.40	1300.00
14' Low Profile Platform (T-Mobile)	C	None			0.0000	97.50	No Ice	19.50	19.50	950.00
							1/2" Ice	28.40	28.40	1300.00
DB222 (Town)	C	From Face	2.00	0.00	0.0000	153.00	No Ice	1.60	1.60	16.00
							1/2" Ice	2.88	2.88	20.80
				0.00						
(2) LPA-185080/8CFx2 w/Mount Pipe (Verizon)	A	From Face	2.00	0.00	0.0000	137.50	No Ice	2.82	4.45	32.55
							1/2" Ice	3.43	5.48	66.25
				0.00						
(2) LPA-80080/8CF w/Mount Pipe (Verizon)	A	From Face	2.00	0.00	0.0000	137.50	No Ice	6.31	14.07	53.20
							1/2" Ice	6.89	15.56	134.40
				0.00						
(2) LPA-185080/8CFx2 w/Mount Pipe	B	From Face	2.00	0.00	0.0000	137.50	No Ice	2.82	4.45	32.55
							1/2" Ice	3.43	5.48	66.25

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 lb
(Verizon)			0.00						
(2) LPA-80080/8CF w/Mount	B	From Face	2.00	0.0000	137.50	No Ice	6.31	14.07	53.20
Pipe			0.00			1/2" Ice	6.89	15.56	134.40
(Verizon)			0.00						
(2) LPA-185080/8CFx2	C	From Face	2.00	0.0000	137.50	No Ice	2.82	4.45	32.55
w/Mount Pipe			0.00			1/2" Ice	3.43	5.48	66.25
(Verizon)			0.00						
(2) LPA-80080/8CF w/Mount	C	From Face	2.00	0.0000	137.50	No Ice	6.31	14.07	53.20
Pipe			0.00			1/2" Ice	6.89	15.56	134.40
(Verizon)			0.00						
(4) 7250.03 w/Mount Pipe	A	From Face	2.00	0.0000	117.50	No Ice	4.45	3.54	40.95
(ATT)			0.00			1/2" Ice	5.03	4.72	76.25
			0.00						
(4) 7250.03 w/Mount Pipe	B	From Face	2.00	0.0000	117.50	No Ice	4.45	3.54	40.95
(ATT)			0.00			1/2" Ice	5.03	4.72	76.25
			0.00						
(4) 7250.03 w/Mount Pipe	C	From Face	2.00	0.0000	117.50	No Ice	4.45	3.54	40.95
(ATT)			0.00			1/2" Ice	5.03	4.72	76.25
			0.00						
(4) DB980F90E-M w/Mount	A	From Face	2.00	0.0000	107.50	No Ice	4.37	3.95	34.05
Pipe			0.00			1/2" Ice	4.96	5.04	70.69
(Sprint)			0.00						
(4) DB980F90E-M w/Mount	B	From Face	2.00	0.0000	107.50	No Ice	4.37	3.95	34.05
Pipe			0.00			1/2" Ice	4.96	5.04	70.69
(Sprint)			0.00						
(4) DB980F90E-M w/Mount	C	From Face	2.00	0.0000	107.50	No Ice	4.37	3.95	34.05
Pipe			0.00			1/2" Ice	4.96	5.04	70.69
(Sprint)			0.00						
(4) DR65-18-02DPL2Q	A	From Face	2.00	0.0000	97.50	No Ice	6.89	4.09	49.55
w/Mount Pipe			0.00			1/2" Ice	7.59	5.15	97.07
(T-Mobile)			0.00						
(4) DR65-18-02DPL2Q	B	From Face	2.00	0.0000	97.50	No Ice	6.89	4.09	49.55
w/Mount Pipe			0.00			1/2" Ice	7.59	5.15	97.07
(T-Mobile)			0.00						
(4) DR65-18-02DPL2Q	C	From Face	2.00	0.0000	97.50	No Ice	6.89	4.09	49.55
w/Mount Pipe			0.00			1/2" Ice	7.59	5.15	97.07
(T-Mobile)			0.00						
GPS	C	From Face	2.00	0.0000	50.00	No Ice	1.00	1.00	10.00
(Sprint)			0.00			1/2" Ice	1.50	1.50	15.00
			0.00						
1-Bay Dipole	C	None		0.0000	148.00	No Ice	0.41	0.41	10.00
						1/2" Ice	0.56	0.56	14.00

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-120.00	133.52	1.491	28	66.354	A	0.000	66.354	66.354	100.00	0.000	0.000
					B	0.000	66.354		100.00		
					C	0.000	66.354		100.00		
L2 120.00-79.00	98.98	1.369	25	121.895	A	0.000	121.895	121.895	100.00	0.000	0.000
					B	0.000	121.895		100.00		
					C	0.000	121.895		100.00		
L3 79.00-39.00	58.85	1.18	22	145.583	A	0.000	145.583	145.583	100.00	0.000	0.638
					B	0.000	145.583		100.00		
					C	0.000	145.583		100.00		
L4 39.00-0.00	18.98	1	18	166.850	A	0.000	166.850	166.850	100.00	0.000	2.262
					B	0.000	166.850		100.00		
					C	0.000	166.850		100.00		

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-120.00	133.52	1.491	21	0.5000	68.688	A	0.000	68.688	68.688	100.00	0.000	0.000
						B	0.000	68.688		100.00		
						C	0.000	68.688		100.00		
L2 120.00-79.00	98.98	1.369	19	0.5000	125.311	A	0.000	125.311	125.311	100.00	0.000	0.000
						B	0.000	125.311		100.00		
						C	0.000	125.311		100.00		
L3 79.00-39.00	58.85	1.18	16	0.5000	148.917	A	0.000	148.917	148.917	100.00	0.000	1.738
						B	0.000	148.917		100.00		
						C	0.000	148.917		100.00		
L4 39.00-0.00	18.98	1	14	0.5000	170.100	A	0.000	170.100	170.100	100.00	0.000	6.162
						B	0.000	170.100		100.00		
						C	0.000	170.100		100.00		

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 148.00-120.00	133.52	1.491	10	66.354	A	0.000	66.354	66.354	100.00	0.000	0.000
					B	0.000	66.354		100.00		
					C	0.000	66.354		100.00		
L2 120.00-79.00	98.98	1.369	9	121.895	A	0.000	121.895	121.895	100.00	0.000	0.000
					B	0.000	121.895		100.00		
					C	0.000	121.895		100.00		
L3 79.00-39.00	58.85	1.18	8	145.583	A	0.000	145.583	145.583	100.00	0.000	0.638
					B	0.000	145.583		100.00		
					C	0.000	145.583		100.00		
L4 39.00-0.00	18.98	1	6	166.850	A	0.000	166.850	166.850	100.00	0.000	2.262

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	0.000	166.850		100.00		
					C	0.000	166.850		100.00		

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	2009.93	71.78	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	5212.51	127.13	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	5362.38	134.06	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	3460.74	88.74	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	1165547.29 lb-ft	16045.57		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	2009.93	71.78	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	5212.51	127.13	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	5362.38	134.06	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	3460.74	88.74	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	1165547.29 lb-ft	16045.57		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	2009.93	71.78	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	5212.51	127.13	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	5362.38	134.06	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	3460.74	88.74	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	1165547.29 lb-ft	16045.57		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	2101.90	A	1	0.65	1	1	1	68.688	1560.46	55.73	C
			B	1	0.65	1	1	1	68.688			
			C	1	0.65	1	1	1	68.688			
L2 120.00-79.00	1555.20	4861.65	A	1	1.002	1	1	1	125.311	4018.97	98.02	C
			B	1	1.002	1	1	1	125.311			
			C	1	1.002	1	1	1	125.311			
L3 79.00-39.00	2002.01	7635.09	A	1	1	1	1	1	148.917	4143.73	103.59	C
			B	1	1	1	1	1	148.917			
			C	1	1	1	1	1	148.917			
L4 39.00-0.00	1977.69	10421.44	A	1	0.65	1	1	1	170.100	2736.52	70.17	C
			B	1	0.65	1	1	1	170.100			
			C	1	0.65	1	1	1	170.100			
Sum Weight:	5783.54	25020.08						OTM	901936.90 lb-ft	12459.68		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	2101.90	A	1	0.65	1	1	1	68.688	1560.46	55.73	C
			B	1	0.65	1	1	1	68.688			
			C	1	0.65	1	1	1	68.688			
L2 120.00-79.00	1555.20	4861.65	A	1	1.002	1	1	1	125.311	4018.97	98.02	C
			B	1	1.002	1	1	1	125.311			
			C	1	1.002	1	1	1	125.311			
L3 79.00-39.00	2002.01	7635.09	A	1	1	1	1	1	148.917	4143.73	103.59	C
			B	1	1	1	1	1	148.917			
			C	1	1	1	1	1	148.917			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L4 39.00-0.00	1977.69	10421.44	A	1	0.65	1	1	1	170.100	2736.52	70.17	C
			B	1	0.65	1	1	1	170.100			
			C	1	0.65	1	1	1	170.100			
Sum Weight:	5783.54	25020.08						OTM	901936.90 lb-ft	12459.68		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	2101.90	A	1	0.65	1	1	1	68.688	1560.46	55.73	C
			B	1	0.65	1	1	1	68.688			
			C	1	0.65	1	1	1	68.688			
L2 120.00-79.00	1555.20	4861.65	A	1	1.002	1	1	1	125.311	4018.97	98.02	C
			B	1	1.002	1	1	1	125.311			
			C	1	1.002	1	1	1	125.311			
L3 79.00-39.00	2002.01	7635.09	A	1	1	1	1	1	148.917	4143.73	103.59	C
			B	1	1	1	1	1	148.917			
			C	1	1	1	1	1	148.917			
L4 39.00-0.00	1977.69	10421.44	A	1	0.65	1	1	1	170.100	2736.52	70.17	C
			B	1	0.65	1	1	1	170.100			
			C	1	0.65	1	1	1	170.100			
Sum Weight:	5783.54	25020.08						OTM	901936.90 lb-ft	12459.68		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	695.48	24.84	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	1803.64	43.99	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	1855.49	46.39	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	1197.49	30.70	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	403303.56 lb-ft	5552.10		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	695.48	24.84	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	1803.64	43.99	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	1855.49	46.39	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	1197.49	30.70	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	403303.56 lb-ft	5552.10		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 148.00-120.00	248.64	1601.84	A	1	0.65	1	1	1	66.354	695.48	24.84	C
			B	1	0.65	1	1	1	66.354			
			C	1	0.65	1	1	1	66.354			
L2 120.00-79.00	1555.20	3941.63	A	1	1.002	1	1	1	121.895	1803.64	43.99	C
			B	1	1.002	1	1	1	121.895			
			C	1	1.002	1	1	1	121.895			
L3 79.00-39.00	1994.75	6539.06	A	1	1	1	1	1	145.583	1855.49	46.39	C
			B	1	1	1	1	1	145.583			
			C	1	1	1	1	1	145.583			
L4 39.00-0.00	1951.95	9173.72	A	1	0.65	1	1	1	166.850	1197.49	30.70	C
			B	1	0.65	1	1	1	166.850			
			C	1	0.65	1	1	1	166.850			
Sum Weight:	5750.54	21256.25						OTM	403303.56 lb-ft	5552.10		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	21256.25					
Bracing Weight	0.00					
Total Member Self-Weight	21256.25			87.98	0.00	
Total Weight	33201.89			87.98	0.00	
Wind 0 deg - No Ice		0.00	-32918.89	-3149649.43	0.00	0.00
Wind 30 deg - No Ice		16459.44	-28508.59	-2727664.63	-1574868.71	187.31

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 60 deg - No Ice		28508.59	-16459.44	-1574780.72	-2727752.62	324.44
Wind 90 deg - No Ice		32918.89	0.00	87.98	-3149737.42	374.63
Wind 120 deg - No Ice		28508.59	16459.44	1574956.69	-2727752.62	324.44
Wind 150 deg - No Ice		16459.44	28508.59	2727840.60	-1574868.71	187.31
Wind 180 deg - No Ice		0.00	32918.89	3149825.40	0.00	0.00
Wind 210 deg - No Ice		-16459.44	28508.59	2727840.60	1574868.71	-187.31
Wind 240 deg - No Ice		-28508.59	16459.44	1574956.69	2727752.62	-324.44
Wind 270 deg - No Ice		-32918.89	0.00	87.98	3149737.42	-374.63
Wind 300 deg - No Ice		-28508.59	-16459.44	-1574780.72	2727752.62	-324.44
Wind 330 deg - No Ice		-16459.44	-28508.59	-2727664.63	1574868.71	-187.31
Member Ice	3763.83					
Total Weight Ice	40650.48			122.18	0.00	
Wind 0 deg - Ice		0.00	-27511.62	-2669704.56	0.00	0.00
Wind 30 deg - Ice		13755.81	-23825.76	-2312015.60	-1334913.37	237.44
Wind 60 deg - Ice		23825.76	-13755.81	-1334791.19	-2312137.78	411.25
Wind 90 deg - Ice		27511.62	0.00	122.18	-2669826.73	474.88
Wind 120 deg - Ice		23825.76	13755.81	1335035.54	-2312137.78	411.25
Wind 150 deg - Ice		13755.81	23825.76	2312259.95	-1334913.37	237.44
Wind 180 deg - Ice		0.00	27511.62	2669948.91	0.00	0.00
Wind 210 deg - Ice		-13755.81	23825.76	2312259.95	1334913.37	-237.44
Wind 240 deg - Ice		-23825.76	13755.81	1335035.54	2312137.78	-411.25
Wind 270 deg - Ice		-27511.62	0.00	122.18	2669826.73	-474.88
Wind 300 deg - Ice		-23825.76	-13755.81	-1334791.19	2312137.78	-411.25
Wind 330 deg - Ice		-13755.81	-23825.76	-2312015.60	1334913.37	-237.44
Total Weight	33201.89			87.98	0.00	
Wind 0 deg - Service		0.00	-11390.62	-1089786.55	0.00	0.00
Wind 30 deg - Service		5695.31	-9864.57	-943771.05	-544937.27	64.81
Wind 60 deg - Service		9864.57	-5695.31	-544849.28	-943859.04	112.26
Wind 90 deg - Service		11390.62	0.00	87.98	-1089874.54	129.63
Wind 120 deg - Service		9864.57	5695.31	545025.25	-943859.04	112.26
Wind 150 deg - Service		5695.31	9864.57	943947.02	-544937.27	64.81
Wind 180 deg - Service		0.00	11390.62	1089962.52	0.00	0.00
Wind 210 deg - Service		-5695.31	9864.57	943947.02	544937.27	-64.81
Wind 240 deg - Service		-9864.57	5695.31	545025.25	943859.04	-112.26
Wind 270 deg - Service		-11390.62	0.00	87.98	1089874.54	-129.63
Wind 300 deg - Service		-9864.57	-5695.31	-544849.28	943859.04	-112.26
Wind 330 deg - Service		-5695.31	-9864.57	-943771.05	544937.27	-64.81

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

Comb. No.	Description
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	148 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5354.24	0.00	-63.70
			Max. Mx	5	-3140.77	-138233.74	-36.59
			Max. My	8	-3140.74	0.00	-138283.00
			Max. Vy	5	8297.19	-138233.74	-36.59
			Max. Vx	8	8297.20	0.00	-138283.00
			Max. Torque	18			-323.77
L2	120 - 79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17753.74	0.00	-63.70
			Max. Mx	5	-11582.22	-768650.45	-46.33
			Max. My	8	-11582.17	0.00	-768700.49
			Max. Vy	5	24014.61	-768650.45	-46.33
			Max. Vx	8	24014.63	0.00	-768700.49
			Max. Torque	18			-323.72
L3	79 - 39	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26818.20	0.00	-122.18
			Max. Mx	5	-20019.60	-1807314.02	-88.74
			Max. My	8	-20019.57	0.00	-1807403.94
			Max. Vy	5	29204.75	-1807314.02	-88.74
			Max. Vx	8	29204.77	0.00	-1807403.94
			Max. Torque	18			-476.74
L4	39 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40650.48	0.00	-122.18
			Max. Mx	5	-33180.31	-3212312.89	-89.76

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	8	-33180.30	0.00	-3212403.34
			Max. Vy	5	32940.64	-3212312.89	-89.76
			Max. Vx	8	32940.65	0.00	-3212403.34
			Max. Torque	18			-476.62

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	21	40650.48	0.00	-27511.62
	Max. H_x	11	33201.89	32918.89	-0.00
	Max. H_z	2	33201.89	0.00	32918.89
	Max. M_x	2	3212222.44	0.00	32918.89
	Max. M_z	5	3212312.89	-32918.89	-0.00
	Max. Torsion	24	476.37	27511.62	0.00
	Min. Vert	1	33201.89	0.00	0.00
	Min. H_x	5	33201.89	-32918.89	-0.00
	Min. H_z	8	33201.89	0.00	-32918.89
	Min. M_x	8	-3212403.34	0.00	-32918.89
	Min. M_z	11	-3212312.89	32918.89	-0.00
	Min. Torsion	18	-476.37	-27511.62	0.00

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	33201.89	0.00	0.00	87.98	0.00	0.00
Dead+Wind 0 deg - No Ice	33201.89	0.00	-32918.89	-3212222.44	0.00	0.00
Dead+Wind 30 deg - No Ice	33201.89	16459.44	-28508.59	-2781854.98	-1606156.50	187.90
Dead+Wind 60 deg - No Ice	33201.89	28508.59	-16459.44	-1606066.96	-2781944.91	325.44
Dead+Wind 90 deg - No Ice	33201.89	32918.89	0.00	89.69	-3212312.89	375.79
Dead+Wind 120 deg - No Ice	33201.89	28508.59	16459.44	1606246.71	-2781945.58	325.45
Dead+Wind 150 deg - No Ice	33201.89	16459.44	28508.59	2782035.50	-1606157.17	187.89
Dead+Wind 180 deg - No Ice	33201.89	0.00	32918.89	3212403.34	0.00	0.00
Dead+Wind 210 deg - No Ice	33201.89	-16459.44	28508.59	2782035.50	1606157.17	-187.89
Dead+Wind 240 deg - No Ice	33201.89	-28508.59	16459.44	1606246.71	2781945.58	-325.45
Dead+Wind 270 deg - No Ice	33201.89	-32918.89	0.00	89.69	3212312.89	-375.79
Dead+Wind 300 deg - No Ice	33201.89	-28508.59	-16459.44	-1606066.96	2781944.91	-325.44
Dead+Wind 330 deg - No Ice	33201.89	-16459.44	-28508.59	-2781854.98	1606156.50	-187.90
Dead+Ice+Temp	40650.48	0.00	0.00	122.18	0.00	0.00
Dead+Wind 0 deg+Ice+Temp	40650.48	0.00	-27511.62	-2743289.69	0.00	0.00
Dead+Wind 30 deg+Ice+Temp	40650.48	13755.81	-23825.76	-2375741.89	-1371707.76	238.19
Dead+Wind 60 deg+Ice+Temp	40650.48	23825.76	-13755.81	-1371582.37	-2375867.95	412.55
Dead+Wind 90 deg+Ice+Temp	40650.48	27511.62	-0.00	125.63	-2743416.67	476.37
Dead+Wind 120 deg+Ice+Temp	40650.48	23825.76	13755.81	1371834.31	-2375869.12	412.56
Dead+Wind 150 deg+Ice+Temp	40650.48	13755.81	23825.76	2375995.17	-1371708.92	238.18
Dead+Wind 180 deg+Ice+Temp	40650.48	0.00	27511.62	2743543.65	0.00	0.00
Dead+Wind 210 deg+Ice+Temp	40650.48	-13755.81	23825.76	2375995.17	1371708.92	-238.18

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 240 deg+Ice+Temp	40650.48	-23825.76	13755.81	1371834.31	2375869.12	-412.56
Dead+Wind 270 deg+Ice+Temp	40650.48	-27511.62	-0.00	125.63	2743416.67	-476.37
Dead+Wind 300 deg+Ice+Temp	40650.48	-23825.76	-13755.81	-1371582.37	2375867.95	-412.55
Dead+Wind 330 deg+Ice+Temp	40650.48	-13755.81	-23825.76	-2375741.89	1371707.76	-238.19
Dead+Wind 0 deg - Service	33201.89	0.00	-11390.62	-1112200.11	0.00	0.00
Dead+Wind 30 deg - Service	33201.89	5695.31	-9864.57	-963181.42	-556145.36	65.30
Dead+Wind 60 deg - Service	33201.89	9864.57	-5695.31	-556054.79	-963272.05	113.10
Dead+Wind 90 deg - Service	33201.89	11390.62	0.00	90.59	-1112290.79	130.59
Dead+Wind 120 deg - Service	33201.89	9864.57	5695.31	556236.02	-963272.13	113.10
Dead+Wind 150 deg - Service	33201.89	5695.31	9864.57	963362.75	-556145.44	65.30
Dead+Wind 180 deg - Service	33201.89	0.00	11390.62	1112381.48	0.00	0.00
Dead+Wind 210 deg - Service	33201.89	-5695.31	9864.57	963362.75	556145.44	-65.30
Dead+Wind 240 deg - Service	33201.89	-9864.57	5695.31	556236.02	963272.13	-113.10
Dead+Wind 270 deg - Service	33201.89	-11390.62	0.00	90.59	1112290.79	-130.59
Dead+Wind 300 deg - Service	33201.89	-9864.57	-5695.31	-556054.79	963272.05	-113.10
Dead+Wind 330 deg - Service	33201.89	-5695.31	-9864.57	-963181.42	556145.36	-65.30

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-33201.89	0.00	0.00	33201.89	0.00	0.000%
2	0.00	-33201.89	-32918.89	0.00	33201.89	32918.89	0.000%
3	16459.44	-33201.89	-28508.59	-16459.44	33201.89	28508.59	0.000%
4	28508.59	-33201.89	-16459.44	-28508.59	33201.89	16459.44	0.000%
5	32918.89	-33201.89	0.00	-32918.89	33201.89	-0.00	0.000%
6	28508.59	-33201.89	16459.44	-28508.59	33201.89	-16459.44	0.000%
7	16459.44	-33201.89	28508.59	-16459.44	33201.89	-28508.59	0.000%
8	0.00	-33201.89	32918.89	0.00	33201.89	-32918.89	0.000%
9	-16459.44	-33201.89	28508.59	16459.44	33201.89	-28508.59	0.000%
10	-28508.59	-33201.89	16459.44	28508.59	33201.89	-16459.44	0.000%
11	-32918.89	-33201.89	0.00	32918.89	33201.89	-0.00	0.000%
12	-28508.59	-33201.89	-16459.44	28508.59	33201.89	16459.44	0.000%
13	-16459.44	-33201.89	-28508.59	16459.44	33201.89	28508.59	0.000%
14	0.00	-40650.48	0.00	0.00	40650.48	0.00	0.000%
15	0.00	-40650.48	-27511.62	0.00	40650.48	27511.62	0.000%
16	13755.81	-40650.48	-23825.76	-13755.81	40650.48	23825.76	0.000%
17	23825.76	-40650.48	-13755.81	-23825.76	40650.48	13755.81	0.000%
18	27511.62	-40650.48	0.00	-27511.62	40650.48	0.00	0.000%
19	23825.76	-40650.48	13755.81	-23825.76	40650.48	-13755.81	0.000%
20	13755.81	-40650.48	23825.76	-13755.81	40650.48	-23825.76	0.000%
21	0.00	-40650.48	27511.62	0.00	40650.48	-27511.62	0.000%
22	-13755.81	-40650.48	23825.76	13755.81	40650.48	-23825.76	0.000%
23	-23825.76	-40650.48	13755.81	23825.76	40650.48	-13755.81	0.000%
24	-27511.62	-40650.48	0.00	27511.62	40650.48	0.00	0.000%
25	-23825.76	-40650.48	-13755.81	23825.76	40650.48	13755.81	0.000%
26	-13755.81	-40650.48	-23825.76	13755.81	40650.48	23825.76	0.000%
27	0.00	-33201.89	-11390.62	0.00	33201.89	11390.62	0.000%
28	5695.31	-33201.89	-9864.57	-5695.31	33201.89	9864.57	0.000%
29	9864.57	-33201.89	-5695.31	-9864.57	33201.89	5695.31	0.000%
30	11390.62	-33201.89	0.00	-11390.62	33201.89	-0.00	0.000%
31	9864.57	-33201.89	5695.31	-9864.57	33201.89	-5695.31	0.000%
32	5695.31	-33201.89	9864.57	-5695.31	33201.89	-9864.57	0.000%
33	0.00	-33201.89	11390.62	0.00	33201.89	-11390.62	0.000%
34	-5695.31	-33201.89	9864.57	5695.31	33201.89	-9864.57	0.000%
35	-9864.57	-33201.89	5695.31	9864.57	33201.89	-5695.31	0.000%
36	-11390.62	-33201.89	0.00	11390.62	33201.89	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
37	-9864.57	-33201.89	-5695.31	9864.57	33201.89	5695.31	0.000%
38	-5695.31	-33201.89	-9864.57	5695.31	33201.89	9864.57	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003428
3	Yes	5	0.00000001	0.00009695
4	Yes	5	0.00000001	0.00009580
5	Yes	4	0.00000001	0.00007513
6	Yes	5	0.00000001	0.00009729
7	Yes	5	0.00000001	0.00009613
8	Yes	4	0.00000001	0.00003428
9	Yes	5	0.00000001	0.00009613
10	Yes	5	0.00000001	0.00009729
11	Yes	4	0.00000001	0.00007513
12	Yes	5	0.00000001	0.00009580
13	Yes	5	0.00000001	0.00009695
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00006527
16	Yes	5	0.00000001	0.00022739
17	Yes	5	0.00000001	0.00022484
18	Yes	5	0.00000001	0.00006546
19	Yes	5	0.00000001	0.00022817
20	Yes	5	0.00000001	0.00022558
21	Yes	5	0.00000001	0.00006528
22	Yes	5	0.00000001	0.00022558
23	Yes	5	0.00000001	0.00022817
24	Yes	5	0.00000001	0.00006546
25	Yes	5	0.00000001	0.00022484
26	Yes	5	0.00000001	0.00022739
27	Yes	4	0.00000001	0.00002010
28	Yes	4	0.00000001	0.00033206
29	Yes	4	0.00000001	0.00032362
30	Yes	4	0.00000001	0.00002413
31	Yes	4	0.00000001	0.00033469
32	Yes	4	0.00000001	0.00032604
33	Yes	4	0.00000001	0.00002010
34	Yes	4	0.00000001	0.00032604
35	Yes	4	0.00000001	0.00033469
36	Yes	4	0.00000001	0.00002413
37	Yes	4	0.00000001	0.00032362
38	Yes	4	0.00000001	0.00033206

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 120	26.324	33	1.3923	0.0010

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	120 - 79	18.247	33	1.3305	0.0005
L3	84 - 39	9.201	33	1.0166	0.0002
L4	45 - 0	2.678	33	0.5370	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	DB222	33	26.324	1.3923	0.0010	60245
148.00	1-Bay Dipole	33	26.324	1.3923	0.0010	60245
137.50	PiROD 13' Low Profile Platform	33	23.248	1.3795	0.0008	28688
117.50	14' Low Profile Platform	33	17.556	1.3184	0.0005	10070
107.50	14' Low Profile Platform	33	14.869	1.2553	0.0004	7997
97.50	14' Low Profile Platform	33	12.333	1.1688	0.0003	6634
50.00	GPS	33	3.266	0.5793	0.0001	3762

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 120	75.944	8	4.0177	0.0039
L2	120 - 79	52.654	8	3.8397	0.0019
L3	84 - 39	26.559	8	2.9345	0.0009
L4	45 - 0	7.732	8	1.5503	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	DB222	8	75.944	4.0177	0.0039	21090
148.00	1-Bay Dipole	8	75.944	4.0177	0.0039	21090
137.50	PiROD 13' Low Profile Platform	8	67.075	3.9836	0.0030	10042
117.50	14' Low Profile Platform	8	50.659	3.8033	0.0018	3522
107.50	14' Low Profile Platform	8	42.910	3.6126	0.0014	2793
97.50	14' Low Profile Platform	8	35.594	3.3585	0.0011	2314
50.00	GPS	8	9.430	1.7105	0.0004	1305

Compression Checks

ERITower	Job	Page
	148' Monopole	16 of 17
URS Corp. AES 500 Enterprise Dr, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Project 151 Berkshire Rd, Newtown, CT	Date 12:58:08 05/10/05
	Client Verizon Wirless	Designed by Jed Kiernan

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	148 - 120 (1)	TP31.375x25.5x0.1875	28.00	148.00	160.4	5.803	18.5605	-3140.74	107714.00	0.029
L2	120 - 79 (2)	TP39.978x31.375x0.25	41.00	148.00	129.0	8.977	30.8464	-11582.20	276896.00	0.042
L3	79 - 39 (3)	TP47.872x38.4289x0.3125	45.00	148.00	107.7	12.863	46.1557	-20019.60	593691.00	0.034
L4	39 - 0 (4)	TP55.43x45.9879x0.375	45.00	148.00	90.9	18.018	65.5292	-33180.30	1180700.00	0.028

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	148 - 120 (1)	TP31.375x25.5x0.1875	138283.33	-11.596	37.180	0.312	0.00	0.000	37.180	0.000
L2	120 - 79 (2)	TP39.978x31.375x0.25	768700.83	-31.413	37.643	0.835	0.00	0.000	37.643	0.000
L3	79 - 39 (3)	TP47.872x38.4289x0.3125	1807400.00	-41.248	38.441	1.073	0.00	0.000	38.441	0.000
L4	39 - 0 (4)	TP55.43x45.9879x0.375	3212400.00	-43.257	39.000	1.109	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	148 - 120 (1)	TP31.375x25.5x0.1875	0.029	0.312	0.000	0.341 ✔	1.333	H1-3 ✔
L2	120 - 79 (2)	TP39.978x31.375x0.25	0.042	0.835	0.000	0.876 ✔	1.333	H1-3 ✔
L3	79 - 39 (3)	TP47.872x38.4289x0.3125	0.034	1.073	0.000	1.107 ✔	1.333	H1-3 ✔
L4	39 - 0 (4)	TP55.43x45.9879x0.375	0.028	1.109	0.000	1.137 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	148 - 120	Pole	TP31.375x25.5x0.1875	1	-3140.74	143582.76	25.6	Pass
L2	120 - 79	Pole	TP39.978x31.375x0.25	2	-11582.20	369102.35	65.7	Pass
L3	79 - 39	Pole	TP47.872x38.4289x0.3125	3	-20019.60	791390.07	83.0	Pass
L4	39 - 0	Pole	TP55.43x45.9879x0.375	4	-33180.30	1573873.03	85.3	Pass
							Summary	
						Pole (L4)	85.3	Pass
						RATING =	**85.3**	**Pass**

Program Version 3.0.0.17 - 7/15/2004 File:P:/Structural/ERI Files/Newtown148'.eri

ANCHOR BOLT AND BASEPLATE ANALYSIS

ANCHOR BOLT AND BASEPLATE ANALYSIS

Input Data

Tower Reactions:

Overturning Moment:	$OM := 3750 \cdot kips \cdot ft$	*user input*	
Shear Force:	$Shear := 35 \cdot kips$	*user input*	(Original Design Values--Conservative)
Axial Force:	$Axial := 38 \cdot kips$	*user input*	

Anchor Bolt Data:

Use ASTM 615 Grade 75

Number of Anchor Bolts = N	$N := 16$	*user input*
Bolt Ultimate Strength:	$F_u := 100 \cdot ksi$	*user input*
Bolt Allowable Strength:	$Fy := 75 \cdot (ksi)$	*user input*
Diameter Of Anchor Bolts	$D := 2.25in$	*user input*
Threaded length per inch	$n := 4.5$	*user input*
Bolt "Column" Distance:	$l := 3.285in$	*user input*
Bolt Modulus:	$E := 29000 \cdot ksi$	*user input*

Base Plate Data:

Plate Yield Strength:	$Fy_{bp} := 55 \cdot 10^3 \cdot \frac{lb}{in^2}$	*user input*
Base Plate Thickness:	$PlateThicknessProvide := 2.75 \cdot in$	*user input*

Geometric Layout Data:

Distance from the center of gravity of the group to bolt in question = d(i)

Distances for loading condition (see detail):

$d_1 := 30.8550 \cdot in$ *user input*

$d_{M2} := 29.7027 \cdot in$ *user input*

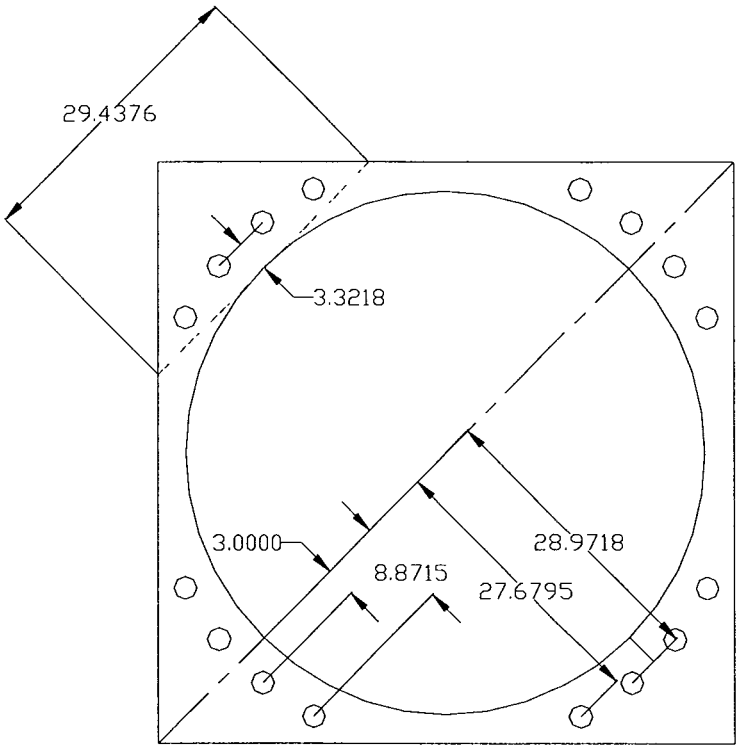
$d_{M3} := 8.8741 \cdot in$ *user input*

$d_{M4} := 2.9953 \cdot in$ *user input*

$MomentArm_1 := 3.140 \cdot in$ *user input*

$MomentArm_2 := 1.9877 \cdot in$ *user input*

$EffectiveWidth := 30.8370 \cdot in$ *user input*



DETAIL - ANCHOR BOLT AND PLATE

Anchor Bolt Section Properties:

Polar Moment of Inertia (J) divided by Area (A) = Σd

$$\Sigma d := (d_1)^2 \cdot 4 + (d_2)^2 \cdot 4 + (d_3)^2 \cdot 4 + (d_4)^2 \cdot 4 \qquad \Sigma d = 7.69 \times 10^3 \, in^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 3.98 \, in^2$$

Net Area of Bolt:

$$A_{net} := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 \qquad A_{net} = 3.25 \, in^2$$

Net Diameter:

$$D_n := \frac{2 \cdot \sqrt{A_{net}}}{\sqrt{\pi}} \qquad D_n = 2.03 \, in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.51 \, in$$

Section Modulus of Bolt:

$$S_x := \frac{\pi \cdot D_n^3}{32} \qquad S_x = 0.83 \, in^3$$

Anchor Bolt Bending Stress:

Maximum Applied Bending:

$$M_x := \left(\frac{Shear}{N} \right) \cdot l \qquad M_x = 0.6 \, kips \cdot ft$$

$$f_{bx} := \frac{M_x}{S_x} \qquad f_{bx} = 8.7 \, ksi$$

Allowable Bending

$$F_{bx} := 1.33 \cdot 0.60 \cdot Fy \qquad F_{bx} = 59.85 \, ksi$$

Note: 1.33 increase allowed per TIA/EIA

Anchor Bolt Tensile Stress Check:

Maximum Tensile Force (Gross Area):

$AllowableTension := 1.33 \cdot (0.33 \cdot A_g \cdot F_u)$ $AllowableTension = 174.51\ kips$

Note: 1.33 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$F_{net.area} := 1.33 \cdot (0.60 \cdot A_{net} \cdot Fy)$ $F_{net.area} = 194.37\ kips$

Note: 1.33 increase allowed per TIA/EIA

Maximum Applied Tension:

$$MaxTension := \frac{OM \cdot d_1}{\Sigma d} - \frac{Axial}{N}$$ $MaxTension = 178.23\ kips$

Check Stresses:

Note: Bolts supplied are "upset bolts." Use net area for checking per AISC.

$AnchorBoltStress := if(F_{net.area} > MaxTension, "Not Overstressed", "Overstressed")$

$AnchorBoltStress = "Not\ Overstressed"$

$$PercentStressed := 100 \cdot \frac{MaxTension}{F_{net.area}}$$

$PercentStressed = 91.69$

Note: Shear Stress is negligible

Check Compression & Combined Stresses (if required):

Check to see if a complete combined stress analysis is required:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required."

Set the clear space between the plate and bolt to zero if a combined stress analysis is not required and set the bending stress to zero:

$$l := \begin{cases} l & \text{if } l > 2 \cdot D_n \\ 0.0\,\text{in} & \text{otherwise} \end{cases} \qquad l = 0$$

$$f_{bx} := \begin{cases} f_{bx} & \text{if } l > 2 \cdot D_n \\ 0.0\,\text{ksi} & \text{otherwise} \end{cases} \qquad f_{bx} = 0\,\text{ksi}$$

Allowable Compressive Force:

$$K := 0.65$$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{Fy}} \qquad C_c = 87.36$$

$$F_a := \begin{cases} \dfrac{\left[1 - \dfrac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^{\,2}}\right] \cdot Fy}{\dfrac{5}{3} + \dfrac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \dfrac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^{\,3}}} & \text{if } \dfrac{K \cdot l}{r} \le C_c \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} & \text{if } \dfrac{K \cdot l}{r} > C_c \end{cases} \qquad F_a = 45\,\text{ksi}$$

$$F_a := 1.33 \cdot F_a \qquad \text{Note: 1.33 increase allowed per TIA/EIA} \qquad F_a = 59.85\,\text{ksi}$$

Applied Compressive Force:

$$\text{MaxCompression} := \frac{OM \cdot d_1}{\Sigma d} + \frac{\text{Axial}}{N} \qquad \text{MaxCompression} = 182.98\,\text{kips}$$

$$f_a := \frac{\text{MaxCompression}}{A_{net}} \qquad f_a = 56.34\,\text{ksi}$$

Check Combined Stresses:

$$\text{StressRatio} := \frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \qquad \text{StressRatio} = 0.941$$

Condition := if(StressRatio ≤ 1.0, "Not Overstressed", "Overstressed")

Condition = "Not Overstressed"

Base Plate Analysis:

Force From Bolt(s):

$$C_1 := \frac{OM \cdot d_1}{\Sigma d} + \frac{Axial}{N} \qquad C_1 = 182.98 \times 10^3 \text{ lb}$$

$$C_2 := \frac{OM \cdot d_2}{\Sigma d} + \frac{Axial}{N} \qquad C_2 = 176.23 \times 10^3 \text{ lb}$$

Bending Stress In Plate:

$$f_{bp} := \frac{6 \cdot \left(2 \cdot C_1 \cdot MomentArm_1 + 2 \cdot C_2 \cdot MomentArm_2\right)}{EffectiveWidth \cdot PlateThicknessProvide^2} \qquad f_{bp} = 47.59 \text{ ksi}$$

Check Stresses:

$$BasePlateRatio := \frac{f_{bp}}{1.33 \cdot 0.75 Fy_{bp}} \qquad BasePlateRatio = 0.87$$

BasePlateStress := if(BasePlateRatio < 1, "Not Over Stress", "Is Over Stress")

BasePlateStress = "Not Over Stress"

FLANGE BOLT AND PLATE ANALYSIS

FLANGE BOLT AND PLATE ANALYSIS

Input Data

Tower Reactions:

Overturning Moment:	$OM := 140 \cdot kips \cdot ft$	*user input*
Shear Force:	$Shear := 8.3 \cdot kips$	*user input*
Axial Force:	$Axial := 5.4 \cdot kips$	*user input*

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts = N	$N := 8$	*user input*
Diameter of Bolt Circle:	$D_{bc} := 35.5in$	*user input*
Bolt Ultimate Strength:	$F_u := 120 \cdot \frac{kips}{in^2}$	*user input*
Bolt Allowable Strength:	$Fy := 92 \cdot \left(1000 \cdot \frac{lb}{in^2} \right)$	*user input*
Thickness Of Anchor Bolts	$D := 1.00in$	*user input*

Flange Plate Data:

Plate Allowable Strength:	$Fy_{bp} := 50 \cdot 10^3 \cdot \frac{lb}{in^2}$	*user input*
Flange Plate Thickness:	$PlateThicknessProvide := 1.0 \cdot in$	*user input*
Flange Plate Diameter:	$D_{bp} := 38.5 \cdot in$	*user input*
Outer Pole Diameter:	$D_{pole} := 31.375in$	*user input*

Geometric Layout Data:

Distance from the center of gravity of the group to bolt in question = d(i)

Radius of Bolt Circle: $R := \frac{D_{bc}}{2}$

Number of Spaces in Quadrant: $N_q := \frac{N}{4}$

Distance to Bolts: $i := 1 .. N_q$

$$d_i := \left| \begin{array}{l} \theta \leftarrow \frac{360}{N} \cdot \frac{\pi}{180} \\ \text{for } j \in i \\ \quad \left| \begin{array}{l} \theta \leftarrow \theta \cdot i \\ d \leftarrow R \cdot \sin(\theta) \end{array} \right. \end{array} \right. \qquad d = \begin{pmatrix} 12.55 \\ 17.75 \end{pmatrix} \text{in}$$

Critical Distances For Bending in Plate:

$$\text{MomentArm}_1 := d_2 - \frac{D_{pole}}{2} \qquad \text{MomentArm}_1 = 2.06\,\text{in}$$

$$\text{EffectiveWidth} := 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} \qquad \text{EffectiveWidth} = 22.31\,\text{in}$$

Flange Bolt Analysis:

Polar Moment of Inertia (J) divided by Area (A) = Σd

$$\Sigma d := \left(d_1\right)^2 \cdot 4 + \left(d_2\right)^2 \cdot 4 \qquad \Sigma d = 1890.37\,in^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 0.79\,in^2$$

Maximum Tensile Force:

$$AllowableTension := 1.33 \cdot \left(0.33 \cdot A_g \cdot F_u\right) \qquad AllowableTension = 41.37\,kips$$

Note: 1.33 increase allowed per TIA/EIA

$$MaxTension := \frac{OM \cdot d_2}{\Sigma d} + \frac{Axial}{N} \qquad MaxTension = 16.45\,kips$$

Check Stresses:

$$AnchorBoltStress := if(AllowableTension > MaxTension, "Not\ Overstressed", "Overstressed")$$

$$AnchorBoltStress = "Not\ Overstressed"$$

$$PercentStressed := 100 \cdot \frac{MaxTension}{AllowableTension}$$

$$PercentStressed = 39.77$$

Note: Shear Stress is negligible

Flange Plate Analysis:

Force From Bolt(s):

$$C_1 := \frac{OM \cdot d_2}{\Sigma d} + \frac{Axial}{N} \qquad C_1 = 16.45\,kips$$

Minimum Plate Thickness Required:

$$PlateThicknessRequired := \sqrt{\frac{(C_1 \cdot MomentArm_1) \cdot 6}{1.33 \cdot Fy_{bp} \cdot EffectiveWidth}}$$

Note: 1.33 increase allowed per TIA/EIA

PlateThicknessRequired = 0.37 in

Check Stresses

$$PercentStressed := \frac{PlateThicknessRequired}{PlateThicknessProvide} \cdot 100$$

BasePlateStress := if(PercentStressed < 100, "OK - Understressed", "No Good - Overstressed")

BasePlateStress = "OK - Understressed"

PercentStressed = 37.039

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@po.state.ct.us
www.ct.gov/csc

July 14, 2005

The Honorable Herbert C. Rosenthal
First Selectman
Town of Newtown
45 Main Street
Newtown, CT 06470

RE: **EM-VER-097-050713** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 151 Berkshire Road, Newtown, Connecticut.

Dear Mr. Rosenthal: Herb –

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.

The Council will consider this item at the next meeting scheduled for August 24, 2005 at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the council by August 23, 2005.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

Hope all is well.

SDP/jkl

Enclosure: Notice of Intent

c: Gary Frenette, Zoning Enforcement Officer, Town of Newtown