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

January 26, 2006

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

RE: **EM-VER-017-020-096-068-060104** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 371 Terryville Avenue, Bristol; 12 Nepaug Road, Burlington; 399 Chestnut Land Road, New Milford; 33 Boardman Road, New Milford; and 136 Bulls Bridge Road, Kent, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on January 25, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated January 4, 2006, including the placement of all necessary equipment and shelters within the tower compounds. 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 existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

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 any of these facilities 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: See attached List

List Attachment:

c: The Honorable William T. Stortz, Mayor, City of Bristol
Alan Weiner, Planner/Dev. Coordinator, City of Bristol
The Honorable Theodore C. Scheidel, Jr., First Selectman, Town of Burlington
Robert J. Coates, Planning and Zoning Chairman, Town of Burlington
The Honorable Ruth S. Epstein, First Selectman, Town of Kent
Judith Wick, Zoning Enforcement Officer, Town of Kent
The Honorable Patricia A. Murphy, Mayor, Town of New Milford
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Michele G. Briggs, New Cingular Wireless PCS, LLC
Thomas F. Flynn III, Sprint Nextel Corporation
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP

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-017-020-096-068-060104

January 4, 2006

Via Hand Delivery

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

Re: **Notice of Exempt Modification**
371 Terryville Avenue, Bristol, CT
12 Nepaug Road, Burlington, CT
399 Chestnut Land Road, New Milford, CT
33 Boardman Road, New Milford, CT
136 Bulls Bridge Road, Kent, CT

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on each of the existing telecommunications towers described below. Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction, on each facility tower, 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 and attachments are being sent to the chief elected official of each affected municipality.

Terryville Avenue, Bristol, CT

The Terryville Avenue facility consists of a 170-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 371 Terryville Road in Bristol. The tower is currently shared by AT&T at the 170-foot level; and Sprint at the 160-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 140-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 1 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

112 Nepaug Road, Burlington, CT

The Nepaug Road facility consists of a 120-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 12 Nepaug Road in Burlington. The tower is currently shared by Cingular at the 119-foot level; and Sprint at the 109-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 99-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 2 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

399 Chestnut Land Road, New Milford, CT

The Chestnut Land Road facility consists of a 160-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 399 Chestnut Land Road in New Milford. The tower is currently shared by Sprint at the 160-foot level; AT&T at the 150-foot level; and Cingular at the 128-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 140-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 3 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

33 Boardman Road, New Milford, CT

The Boardman Road facility consists of a 150-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 33 Boardman Road in New Milford. The tower is currently under construction. The tower will be shared by Sprint at the 150-foot level; Nextel at the 140-foot level; and Cingular at the 120-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 130-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 4 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

136 Bulls Bridge Road, Kent, CT

The Bulls Bridge Road facility consists of a 180-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 136 Bulls Bridge Road in Kent. The tower is currently shared by Cingular at the 180-foot level; and AT&T at the 170-foot level; the Connecticut State Police at the 142-

foot level; Sprint at the 125-foot level; WMNR at the 119- foot level; and Nextel at the 110-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 160-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 5 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

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

1. Cellco's proposed modifications will not result in any increase in the overall height of any of the existing structures.

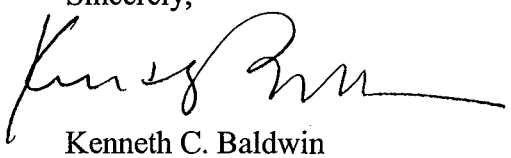
2. Cellco's proposed modifications will not require the extension of the existing site boundaries at any of the sites identified.

3. Cellco's proposed modifications will not increase noise levels at the facility by six decibels or more at any of the facilities.

4. Cellco's proposed modifications will not result in radio frequency (RF) power density levels at any of the facilities that would exceed the Federal Communications Commission (FCC) adopted safety standard.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facilities constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures
cc: William T. Stortz, Bristol Mayor
Theodore Scheidel, Burlington First Selectman
Patricia A. Murphy, New Milford Mayor
Ruth Epstein, Kent First Selectman
Sandy M. Carter

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

BRISTOL WEST II
371 TERRYVILLE AVENUE
BRISTOL, CT

PROJECT SUMMARY

SITE NAME:	BRISTOL WEST II
SITE ADDRESS:	371 TERRYVILLE AVENUE BRISTOL, CONNECTICUT 06010
PROPERTY OWNER:	BRISTOL HOSPITAL 41 BREWSTER ROAD BRISTOL, CT 06010
LESSOR:	AT&T WIRELESS 15 EAST MIDLAND AVENUE PARAMUS, NJ 07652
LESSEE:	CELLCO PARTNERSHIP 99 EAST RIVER DR. EAST HARTFORD, CT 06108
APPLICANT:	CELLCO PARTNERSHIP 99 EAST RIVER DR. EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 803-8219
CENTER OF TOWER:	LATITUDE 41° 40' 47.65" LONGITUDE 72° 57' 45.63" GROUND ELEV. 542'± A.M.S.L. COORDINATES AND GROUND ELEVATION BASED ON CSC DATA BASE

GENERAL NOTE

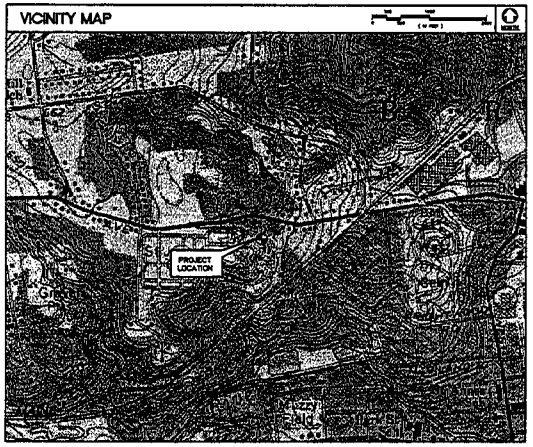
1. PROPOSED AND EXISTING ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

SITE DIRECTIONS

FROM: 99 EAST RIVER DR.,EAST HARTFORD, CT.
TO: 371 TERRYVILLE AVE, BRISTOL, CT

1:	START OUT GOING EAST ON E RIVER DR TOWARD DARLIN ST	0.2 MILES
2:	TURN LEFT TO STAY ON E RIVER DR.	<0.1 MILES
3:	TURN LEFT ONTO US-44 W / CONNECTICUT BLVD.	0.1 MILES
4:	STAY STRAIGHT TO GO ONTO RAMP.	<0.1 MILES
5:	MERGE ONTO I-84 W / US-6 W / US-44 W.	<0.1 MILES
6:	MERGE ONTO I-84 W.	13.9 MILES
7:	MERGE ONTO CT-72 N VIA EXIT 33 TOWARD PLAINVILLE / BRISTOL.	2.8 MILES
8:	TURN RIGHT ONTO CT-72/FORESTVILLE AVE.	2.0 MILES
9:	TURN RIGHT ONTO MEMORIAL BOULEVARD / CT-72	0.3 MILES
10:	TURN SLIGHT RIGHT ONTO CT-72/RIVERSIDE AVE	1.0 MILES
11:	TURN RIGHT ONTO N MAIN STREET	0.9 MILES
12:	TURN LEFT ONTO US-6 / CT-69 / NORTH STREET	0.7 MILES
13:	END AT 371 TERRYVILLE AVE.	

VICINITY MAP



LEGEND

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

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	00
C-1	COMPOUND PLAN AND ELEVATION	00

SITE INFORMATION

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 12'x30' PREFABRICATED WIRELESS EQUIPMENT SHELTER ON A CONCRETE FOUNDATION WITHIN AN EXISTING WIRELESS COMMUNICATIONS COMPOUND.
2. TWELVE (12) PANEL ANTENNAS ARE TO BE MOUNTED ONTO AN EXISTING 170' MONOPOLE AT A RAD CENTER ELEVATION OF 140' WITHIN THE EXISTING COMPOUND.
3. ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND TO THE PROPOSED EQUIPMENT SHELTER FROM THE EXISTING UTILITY BACKBOARD LOCATED ADJACENT TO THE COMPOUND.

REVISIONS		
00	11/23/05	CSC REVIEW

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC.

PROFESSIONAL ENGINEER SEAL

BRISTOL WEST II

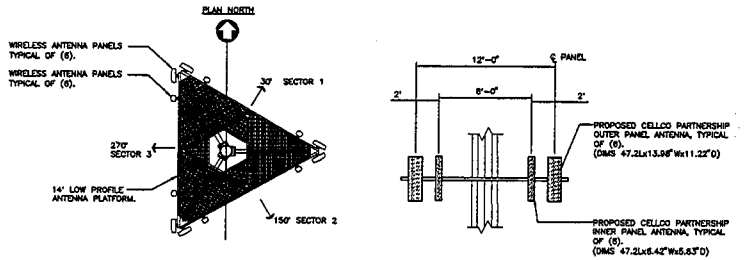
371 TERRYVILLE AVENUE
BRISTOL, CT.

PROJECT NO:	05114
DRAWN BY:	CMS
CHECKED BY:	AAJ
SCALE:	AS NOTED
DATE:	11/16/05

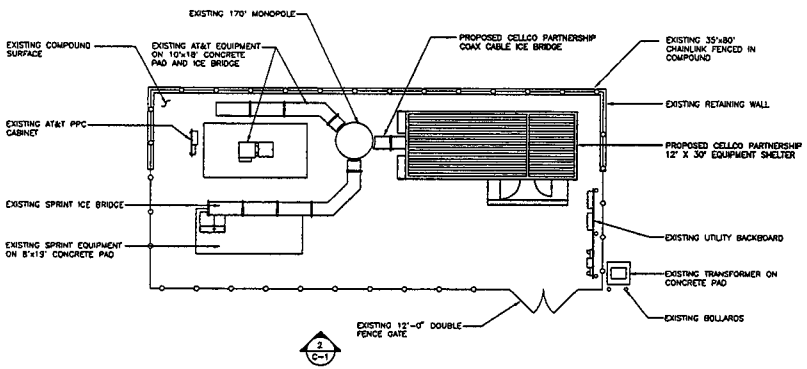
TITLE SHEET

T-1

DWG. 1 OF 2



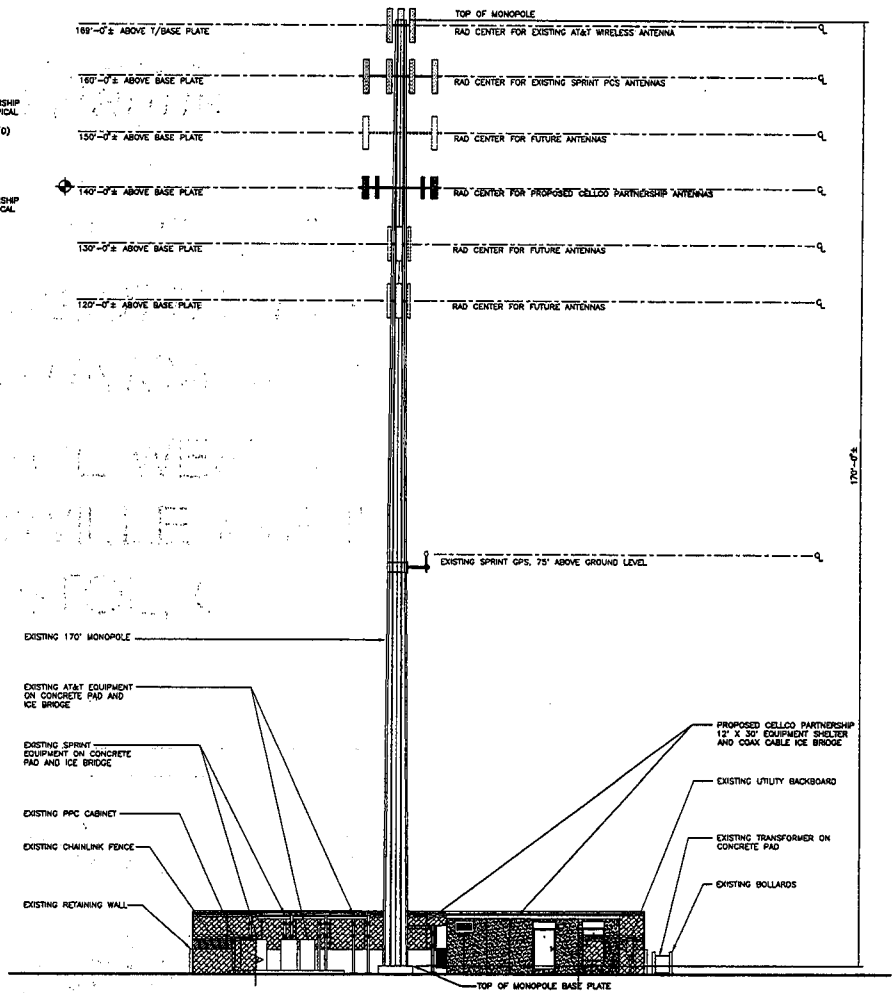
3 C-1 MONOPOLE ANTENNA MOUNTING CONFIGURATION N.T.S.



1 C-1 COMPOUND PLAN SCALE: 1"=10'-0" TRUE NORTH

GRAPHIC SCALE

(IN FEET) 1 inch = 10 ft.



2 C-1 ELEVATION SCALE: 1"=10'-0"

GRAPHIC SCALE

(IN FEET) 1 inch = 10 ft.

REVISIONS		
00	11/23/05	CSC REVIEW

Cellco Partnership d.b.a. verizon wireless

Natcomm, LLC - Engineering Consultants
NATCOMM
Natcomm, LLC.
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers - Project Management
Civil - Structural - Mechanical - Electrical

PROFESSIONAL ENGINEER SEAL

BRISTOL WEST II

371 TERRYVILLE AVENUE
BRISTOL, CT.

PROJECT NO:	05114
DRAWN BY:	CMS
CHECKED BY:	AAJ
SCALE:	AS NOTED
DATE:	11/18/05

COMPOUND PLAN AND ELEVATION

C-1

DWG. 2 OF 2

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF EXISTING 170' MONOPOLE FOR NEW ANTENNA ARRANGEMENT

Bristol West 2
371 Terryville Avenue
Bristol, Connecticut

prepared for

verizon wireless

Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by

URS

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

36930978.00000
VZ1-163

December 12, 2005

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 170' steel monopole structure located at 371 Terryville Avenue in Bristol, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 80 mph and 69 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 in the Introduction Section of this report. The proposed Verizon Wireless modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Install (6) Antel LPD-6513 and (6) Antel LPD 185063/8CFx2 antennas on a new 12' Low-Profile Platform with (12) 1 5/8" coax cables within the monopole.	**Verizon Wireless (Proposed)**	**@ 140'**

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading.**

This analysis is based on:

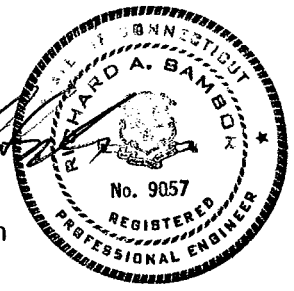
1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry and structural member sizes taken from original construction drawings (EEI Job #: 12027 rev 1) prepared by Engineered Endeavors, Inc., signed and sealed November 26, 2003.
3) Antenna and mount configuration as specified on the following page of this report.

This report is only valid as 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 assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation



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

RAS/jek

cc: AA, DR, IA – URS
CF/Book

2. INTRODUCTION

The subject tower is located at 371 Terryville Avenue in Bristol, Connecticut. The structure is a 170' steel monopole designed by EEI, Inc.

The tower geometry and structure member sizes were taken from the original construction drawings (EEI Job #: 12027 rev 1) prepared by Engineered Endeavors, Inc., signed and sealed November 26, 2003.

The inventory is summarized in the table below:

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(12) Powerwave 7770.00 antennas and (12) TMA's	Cingular (existing and future)	Low-Profile Platform	169'	(18) 1 5/8" coax cables (within monopole)
(9) Decibel DB980F90E-M antennas	Sprint (existing)	Low-Profile Platform	160'	(9) 1 5/8" coax cables (within monopole)
(6) Antel LPD-6513 and (6) Antel LPD 185063/8CFx2 antennas	**Verizon (proposed)**	**Low-Profile Platform**	**140'**	**(12) 1 5/8" coax cables (within monopole)**

This structural analysis of the communications tower was performed by URS Corporation (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

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 = 80 mph Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 69 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 tower 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 load condition are provided in section 6 of this report. Additionally, the anchor bolts and base plate were found to be structurally adequate. No further analysis was conducted on the foundation since the reactions at the top of the foundation were below the original design.

5. CONCLUSIONS

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are structurally adequate under the TIA/EIA-222-F wind load classification specified above and the 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 unless specified otherwise.

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

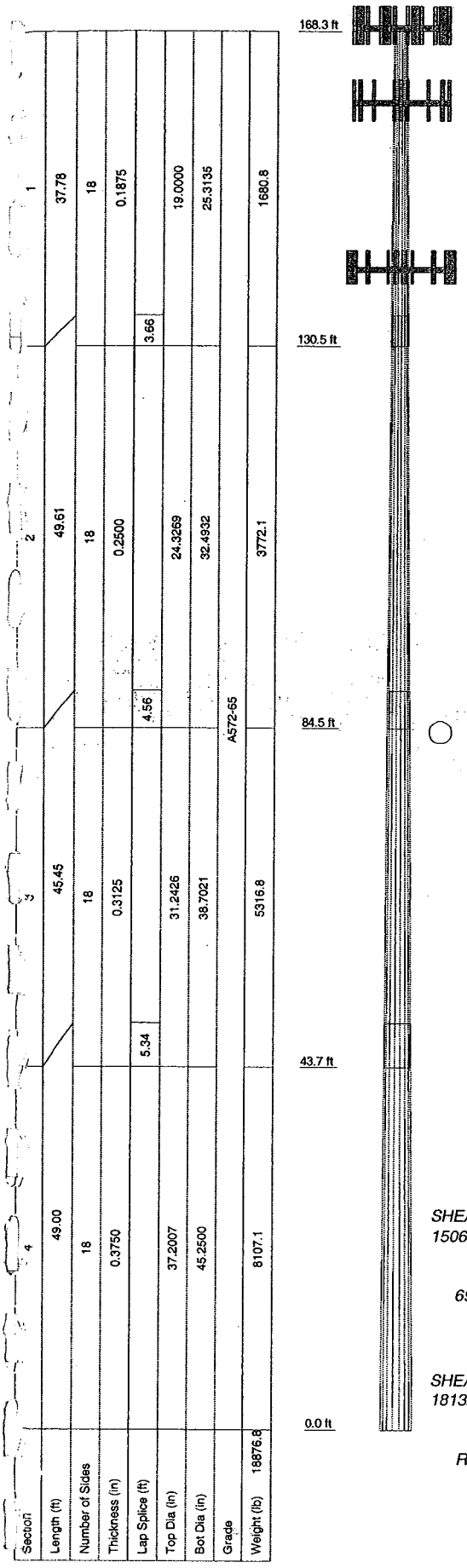
URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of 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.

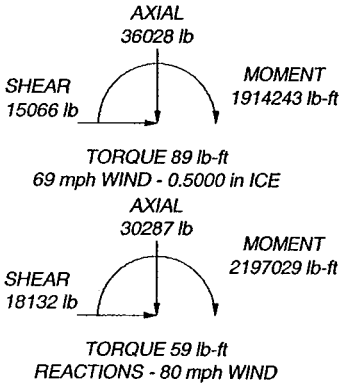
Ongoing and Periodic Inspection and Maintenance:

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





APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
12' Low Profile Platform (Cingular)	169	LPD-6513 (Verizon)	140
(4) 7770.00 (Cingular)	169	LPA-185063/8CFx2 (Verizon)	140
(4) 7770.00 (Cingular)	169	LPA-185063/8CFx2 (Verizon)	140
(4) 7770.00 (Cingular)	169	LPD-6513 (Verizon)	140
(4) TMA (Cingular)	169	LPD-6513 (Verizon)	140
(4) TMA (Cingular)	169	LPA-185063/8CFx2 (Verizon)	140
(4) TMA (Cingular)	169	LPA-185063/8CFx2 (Verizon)	140
12' Low Profile Platform (Sprint)	160	LPD-6513 (Verizon)	140
(3) DB980F90E-M (Sprint)	160	LPD-6513 (Verizon)	140
(3) DB980F90E-M (Sprint)	160	LPA-185063/8CFx2 (Verizon)	140
(3) DB980F90E-M (Sprint)	160	LPA-185063/8CFx2 (Verizon)	140
12' Low Profile Platform (Verizon)	140	Side Arm Mount (Sprint)	75
LPD-6513 (Verizon)	140	GPS (Sprint)	75

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.6%

URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: (860) 529-8882
FAX: (860) 529-3991

Job: ***170' EEI Monopole***			
Project: ***Bristol, CT***			
Client: Verizon Wireless	Drawn by: Jed Kiernan	App'd:	
Code: TIA/EIA-222-F	Date: 12/12/05	Scale: NT	
Path: P:\F08\ERI Files\170' EEI-Bristol.eri		Dwg No. E-	

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	19.2931	11.1958	500.5935	6.6784	9.6520	51.8642	1001.8456	5.5990	3.0140	16.075
	25.7040	14.9531	1192.6574	8.9197	12.8593	92.7470	2386.8842	7.4780	4.1252	22.001
L2	25.3139	19.1050	1399.2149	8.5473	12.3580	113.2230	2800.2709	9.5543	3.8415	15.366
	32.9945	25.5850	3360.4605	11.4463	16.5065	203.5835	6725.3427	12.7949	5.2788	21.115
L3	32.4845	30.6788	3707.9797	10.9802	15.8712	233.6290	7420.8384	15.3423	4.9487	15.836
	39.2991	38.0777	7089.8191	13.6283	19.6607	360.6093	14188.9672	19.0425	6.2616	20.037
L4	38.6653	43.8318	7509.7853	13.0731	18.8979	397.3865	15029.4522	21.9200	5.8873	15.7
	45.9481	53.4125	13589.0478	15.9306	22.9870	591.1623	27195.9763	26.7113	7.3040	19.477

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 168.28-130.50				1	1	1		
L2 130.50-84.55				1	1	1		
L3 84.55-43.66				1	1	1		
L4 43.66-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8 (Cingular)	C	No	Inside Pole	168.28 - 0.00	18	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (Sprint)	C	No	Inside Pole	160.00 - 0.00	9	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (Verizon)	C	No	Inside Pole	140.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04

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	168.28-130.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1101.92
L2	130.50-84.55	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	1863.73
L3	84.55-43.66	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	1658.50
L4	43.66-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1770.85

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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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	168.28-130.50	37.78	3.66	18	19.0000	25.3135	0.1875	0.7500	A572-65 (65 ksi)
L2	130.50-84.55	49.61	4.56	18	24.3269	32.4932	0.2500	1.0000	A572-65 (65 ksi)
L3	84.55-43.66	45.45	5.34	18	31.2426	38.7021	0.3125	1.2500	A572-65 (65 ksi)
L4	43.66-0.00	49.00		18	37.2007	45.2500	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	19.2931	11.1958	500.5935	6.6784	9.6520	51.8642	1001.8456	5.5990	3.0140	16.075
	25.7040	14.9531	1192.6574	8.9197	12.8593	92.7470	2386.8842	7.4780	4.1252	22.001
L2	25.3139	19.1050	1399.2149	8.5473	12.3580	113.2230	2800.2709	9.5543	3.8415	15.366
	32.9945	25.5850	3360.4605	11.4463	16.5065	203.5835	6725.3427	12.7949	5.2788	21.115
L3	32.4845	30.6788	3707.9797	10.9802	15.8712	233.6290	7420.8384	15.3423	4.9487	15.836
	39.2991	38.0777	7089.8191	13.6283	19.6607	360.6093	14188.9672	19.0425	6.2616	20.037
L4	38.6653	43.8318	7509.7853	13.0731	18.8979	397.3865	15029.4522	21.9200	5.8873	15.7
	45.9481	53.4125	13589.0478	15.9306	22.9870	591.1623	27195.9763	26.7113	7.3040	19.477

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 168.28-130.50				1	1	1		
L2 130.50-84.55				1	1	1		
L3 84.55-43.66				1	1	1		
L4 43.66-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8 (Cingular)	C	No	Inside Pole	168.28 - 0.00	18	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (Sprint)	C	No	Inside Pole	160.00 - 0.00	9	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (Verizon)	C	No	Inside Pole	140.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04

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	168.28-130.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1101.92
L2	130.50-84.55	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	1863.73
L3	84.55-43.66	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	1658.50
L4	43.66-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1770.85

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	168.28-130.50	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1101.92
L2	130.50-84.55	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	1863.73
L3	84.55-43.66	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	1658.50
L4	43.66-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1770.85

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
12' Low Profile Platform (Cingular)	C	None		0.0000	169.00	No Ice	14.00	14.00	1350.00
						1/2" Ice	20.00	20.00	1800.00
(4) 7770.00 (Cingular)	A	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	5.88	2.93	35.00
						1/2" Ice	6.31	3.27	67.63
(4) 7770.00 (Cingular)	B	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	5.88	2.93	35.00
						1/2" Ice	6.31	3.27	67.63
(4) 7770.00 (Cingular)	C	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	5.88	2.93	35.00
						1/2" Ice	6.31	3.27	67.63
(4) TMA (Cingular)	A	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	0.95	0.95	15.00
						1/2" Ice	1.50	1.50	25.00
(4) TMA (Cingular)	B	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	0.95	0.95	15.00
						1/2" Ice	1.50	1.50	25.00
(4) TMA (Cingular)	C	From Face	3.00 0.00 0.00	0.0000	169.00	No Ice	0.95	0.95	15.00
						1/2" Ice	1.50	1.50	25.00
12' Low Profile Platform (Sprint)	C	None		0.0000	160.00	No Ice	14.00	14.00	1350.00
						1/2" Ice	20.00	20.00	1800.00
(3) DB980F90E-M (Sprint)	A	From Face	3.00 0.00 0.00	0.0000	160.00	No Ice	3.90	2.29	8.50
						1/2" Ice	4.28	2.65	29.47
(3) DB980F90E-M (Sprint)	B	From Face	3.00 0.00 0.00	0.0000	160.00	No Ice	3.90	2.29	8.50
						1/2" Ice	4.28	2.65	29.47
(3) DB980F90E-M	C	From Face	3.00	0.0000	160.00	No Ice	3.90	2.29	8.50

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
(Sprint)			0.00 0.00			1/2" Ice	4.28	2.65	29.47
12' Low Profile Platform	C	None		0.0000	140.00	No Ice	14.00	14.00	1350.00
(Verizon)						1/2" Ice	20.00	20.00	1800.00
LPD-6513	A	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPD-6513	A	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			-6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPA-185063/8CFx2	A	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			4.00 0.00			1/2" Ice	3.38	3.04	31.17
LPA-185063/8CFx2	A	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			-4.00 0.00			1/2" Ice	3.38	3.04	31.17
LPD-6513	B	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPD-6513	B	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			-6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPA-185063/8CFx2	B	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			4.00 0.00			1/2" Ice	3.38	3.04	31.17
LPA-185063/8CFx2	B	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			-4.00 0.00			1/2" Ice	3.38	3.04	31.17
LPD-6513	C	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPD-6513	C	From Face	3.00	0.0000	140.00	No Ice	6.42	5.15	28.00
(Verizon)			-6.00 0.00			1/2" Ice	6.82	5.53	51.00
LPA-185063/8CFx2	C	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			4.00 0.00			1/2" Ice	3.38	3.04	31.17
LPA-185063/8CFx2	C	From Face	3.00	0.0000	140.00	No Ice	3.04	2.73	9.00
(Verizon)			-4.00 0.00			1/2" Ice	3.38	3.04	31.17
Side Arm Mount	C	None		0.0000	75.00	No Ice	1.50	1.50	57.00
(Sprint)						1/2" Ice	2.00	2.00	73.81
GPS	C	From Face	2.00	0.0000	75.00	No Ice	0.50	0.50	10.00
(Sprint)			0.00 0.00			1/2" Ice	1.00	1.00	15.00

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 168.28-130.50	148.66	1.537	25	69.757	A	0.000	69.757	69.757	100.00	0.000	0.000
					B	0.000	69.757		100.00		
					C	0.000	69.757		100.00		
L2 130.50-84.55	106.87	1.399	23	109.940	A	0.000	109.940	109.940	100.00	0.000	0.000
					B	0.000	109.940		100.00		
					C	0.000	109.940		100.00		
L3 84.55-43.66	63.93	1.208	20	120.443	A	0.000	120.443	120.443	100.00	0.000	0.000
					B	0.000	120.443		100.00		
					C	0.000	120.443		100.00		
L4 43.66-0.00	21.20	1	16	151.587	A	0.000	151.587	151.587	100.00	0.000	0.000
					B	0.000	151.587		100.00		
					C	0.000	151.587		100.00		

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 168.28-130.50	148.66	1.537	19	0.5000	72.905	A	0.000	72.905	72.905	100.00	0.000	0.000
						B	0.000	72.905		100.00		
						C	0.000	72.905		100.00		
L2 130.50-84.55	106.87	1.399	17	0.5000	113.769	A	0.000	113.769	113.769	100.00	0.000	0.000
						B	0.000	113.769		100.00		
						C	0.000	113.769		100.00		
L3 84.55-43.66	63.93	1.208	15	0.5000	123.851	A	0.000	123.851	123.851	100.00	0.000	0.000
						B	0.000	123.851		100.00		
						C	0.000	123.851		100.00		
L4 43.66-0.00	21.20	1	12	0.5000	155.226	A	0.000	155.226	155.226	100.00	0.000	0.000
						B	0.000	155.226		100.00		
						C	0.000	155.226		100.00		

Tower Pressure - Service

$G_H = 1.690$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 168.28-130.50	148.66	1.537	10	69.757	A	0.000	69.757	69.757	100.00	0.000	0.000
					B	0.000	69.757		100.00		
					C	0.000	69.757		100.00		
L2 130.50-84.55	106.87	1.399	9	109.940	A	0.000	109.940	109.940	100.00	0.000	0.000
					B	0.000	109.940		100.00		
					C	0.000	109.940		100.00		
L3 84.55-43.66	63.93	1.208	8	120.443	A	0.000	120.443	120.443	100.00	0.000	0.000
					B	0.000	120.443		100.00		
					C	0.000	120.443		100.00		
L4 43.66-0.00	21.20	1	6	151.587	A	0.000	151.587	151.587	100.00	0.000	0.000

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	151.587		100.00		
					C	0.000	151.587		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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	1928.66	51.05	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	2762.28	60.11	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	2606.09	63.73	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	2728.24	62.49	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	806367.01 lb-ft	10025.27		

Tower Forces - No Ice - Wind 45 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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	1928.66	51.05	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	2762.28	60.11	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	2606.09	63.73	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	2728.24	62.49	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	806367.01 lb-ft	10025.27		

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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	1928.66	51.05	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	2762.28	60.11	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	2606.09	63.73	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	2728.24	62.49	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	806367.01 lb-ft	10025.27		

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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	1928.66	51.05	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	2762.28	60.11	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	2606.09	63.73	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	2728.24	62.49	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	806367.01 lb-ft	10025.27		

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 168.28-130.50	1101.92	2209.09	A	1	0.65	1	1	1	72.905	1511.78	40.02	C
			B	1	0.65	1	1	1	72.905			
			C	1	0.65	1	1	1	72.905			
L2 130.50-84.55	1863.73	4600.49	A	1	0.65	1	1	1	113.769	2143.86	46.66	C
			B	1	0.65	1	1	1	113.769			
			C	1	0.65	1	1	1	113.769			
L3 84.55-43.66	1658.50	6221.43	A	1	0.65	1	1	1	123.851	2009.86	49.15	C
			B	1	0.65	1	1	1	123.851			
			C	1	0.65	1	1	1	123.851			

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L4 43.66-0.00	1770.85	9243.19	A	1	0.65	1	1	1	155.226	2095.29	47.99	C
			B	1	0.65	1	1	1	155.226			
			C	1	0.65	1	1	1	155.226			
Sum Weight:	6395.00	22274.20						OTM	626767.62 lb-ft	7760.79		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 168.28-130.50	1101.92	2209.09	A	1	0.65	1	1	1	72.905	1511.78	40.02	C
			B	1	0.65	1	1	1	72.905			
			C	1	0.65	1	1	1	72.905			
L2 130.50-84.55	1863.73	4600.49	A	1	0.65	1	1	1	113.769	2143.86	46.66	C
			B	1	0.65	1	1	1	113.769			
			C	1	0.65	1	1	1	113.769			
L3 84.55-43.66	1658.50	6221.43	A	1	0.65	1	1	1	123.851	2009.86	49.15	C
			B	1	0.65	1	1	1	123.851			
			C	1	0.65	1	1	1	123.851			
L4 43.66-0.00	1770.85	9243.19	A	1	0.65	1	1	1	155.226	2095.29	47.99	C
			B	1	0.65	1	1	1	155.226			
			C	1	0.65	1	1	1	155.226			
Sum Weight:	6395.00	22274.20						OTM	626767.62 lb-ft	7760.79		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 168.28-130.50	1101.92	2209.09	A	1	0.65	1	1	1	72.905	1511.78	40.02	C
			B	1	0.65	1	1	1	72.905			
			C	1	0.65	1	1	1	72.905			
L2 130.50-84.55	1863.73	4600.49	A	1	0.65	1	1	1	113.769	2143.86	46.66	C
			B	1	0.65	1	1	1	113.769			
			C	1	0.65	1	1	1	113.769			
L3 84.55-43.66	1658.50	6221.43	A	1	0.65	1	1	1	123.851	2009.86	49.15	C
			B	1	0.65	1	1	1	123.851			
			C	1	0.65	1	1	1	123.851			
L4 43.66-0.00	1770.85	9243.19	A	1	0.65	1	1	1	155.226	2095.29	47.99	C
			B	1	0.65	1	1	1	155.226			
			C	1	0.65	1	1	1	155.226			
Sum Weight:	6395.00	22274.20						OTM	626767.62 lb-ft	7760.79		

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 168.28-130.50	1101.92	2209.09	A	1	0.65	1	1	1	72.905	1511.78	40.02	C
			B	1	0.65	1	1	1	72.905			
			C	1	0.65	1	1	1	72.905			
L2 130.50-84.55	1863.73	4600.49	A	1	0.65	1	1	1	113.769	2143.86	46.66	C
			B	1	0.65	1	1	1	113.769			
			C	1	0.65	1	1	1	113.769			
L3 84.55-43.66	1658.50	6221.43	A	1	0.65	1	1	1	123.851	2009.86	49.15	C
			B	1	0.65	1	1	1	123.851			
			C	1	0.65	1	1	1	123.851			
L4 43.66-0.00	1770.85	9243.19	A	1	0.65	1	1	1	155.226	2095.29	47.99	C
			B	1	0.65	1	1	1	155.226			
			C	1	0.65	1	1	1	155.226			
Sum Weight:	6395.00	22274.20						OTM	626767.62 lb-ft	7760.79		

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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	753.38	19.94	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	1079.01	23.48	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	1018.00	24.90	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	1065.72	24.41	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	314987.11 lb-ft	3916.12		

Tower Forces - Service - Wind 45 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 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	753.38	19.94	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	1079.01	23.48	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	1018.00	24.90	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	1065.72	24.41	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	314987.11 lb-ft	3916.12		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	753.38	19.94	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	1079.01	23.48	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	1018.00	24.90	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	1065.72	24.41	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	314987.11 lb-ft	3916.12		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 168.28-130.50	1101.92	1680.81	A	1	0.65	1	1	1	69.757	753.38	19.94	C
			B	1	0.65	1	1	1	69.757			
			C	1	0.65	1	1	1	69.757			
L2 130.50-84.55	1863.73	3772.10	A	1	0.65	1	1	1	109.940	1079.01	23.48	C
			B	1	0.65	1	1	1	109.940			
			C	1	0.65	1	1	1	109.940			
L3 84.55-43.66	1658.50	5316.81	A	1	0.65	1	1	1	120.443	1018.00	24.90	C
			B	1	0.65	1	1	1	120.443			
			C	1	0.65	1	1	1	120.443			
L4 43.66-0.00	1770.85	8107.06	A	1	0.65	1	1	1	151.587	1065.72	24.41	C
			B	1	0.65	1	1	1	151.587			
			C	1	0.65	1	1	1	151.587			
Sum Weight:	6395.00	18876.78						OTM	314987.11 lb-ft	3916.12		

ERITower

URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: (860) 529-8882
FAX: (860) 529-3991

Job	Page
170' EEI Monopole	11 of 19
Project	**Date**
Bristol, CT	14:44:02 12/12/05
Client	**Designed by**
Verizon Wireless	Jed Kiernan

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	18876.78					
Bracing Weight	0.00					
Total Member Self-Weight	18876.78			33.98	0.00	
Total Weight	30287.28			33.98	0.00	
Wind 0 deg - No Ice		0.00	-18132.05	-2073325.18	0.00	0.00
Wind 30 deg - No Ice		9066.03	-15702.82	-1795547.73	-1036679.58	29.74
Wind 45 deg - No Ice		12821.30	-12821.30	-1466052.34	-1466086.33	42.06
Wind 60 deg - No Ice		15702.82	-9066.03	-1036645.60	-1795581.71	51.52
Wind 90 deg - No Ice		18132.05	0.00	33.98	-2073359.17	59.48
Wind 120 deg - No Ice		15702.82	9066.03	1036713.57	-1795581.71	51.52
Wind 135 deg - No Ice		12821.30	12821.30	1466120.31	-1466086.33	42.06
Wind 150 deg - No Ice		9066.03	15702.82	1795615.69	-1036679.58	29.74
Wind 180 deg - No Ice		0.00	18132.05	2073393.15	0.00	0.00
Wind 210 deg - No Ice		-9066.03	15702.82	1795615.69	1036679.58	-29.74
Wind 225 deg - No Ice		-12821.30	12821.30	1466120.31	1466086.33	-42.06
Wind 240 deg - No Ice		-15702.82	9066.03	1036713.57	1795581.71	-51.52
Wind 270 deg - No Ice		-18132.05	0.00	33.98	2073359.17	-59.48
Wind 300 deg - No Ice		-15702.82	-9066.03	-1036645.60	1795581.71	-51.52
Wind 315 deg - No Ice		-12821.30	-12821.30	-1466052.34	1466086.33	-42.06
Wind 330 deg - No Ice		-9066.03	-15702.82	-1795547.73	1036679.58	-29.74
Member Ice	3397.42					
Total Weight Ice	36027.94			50.97	0.00	
Wind 0 deg - Ice		0.00	-15066.33	-1769485.70	0.00	0.00
Wind 30 deg - Ice		7533.16	-13047.82	-1532412.74	-884768.34	44.61
Wind 45 deg - Ice		10653.50	-10653.50	-1251200.41	-1251251.38	63.09
Wind 60 deg - Ice		13047.82	-7533.16	-884717.36	-1532463.71	77.27
Wind 90 deg - Ice		15066.33	0.00	50.97	-1769536.67	89.23
Wind 120 deg - Ice		13047.82	7533.16	884819.31	-1532463.71	77.27
Wind 135 deg - Ice		10653.50	10653.50	1251302.36	-1251251.38	63.09
Wind 150 deg - Ice		7533.16	13047.82	1532514.69	-884768.34	44.61
Wind 180 deg - Ice		0.00	15066.33	1769587.65	0.00	0.00
Wind 210 deg - Ice		-7533.16	13047.82	1532514.69	884768.34	-44.61
Wind 225 deg - Ice		-10653.50	10653.50	1251302.36	1251251.38	-63.09
Wind 240 deg - Ice		-13047.82	7533.16	884819.31	1532463.71	-77.27
Wind 270 deg - Ice		-15066.33	0.00	50.97	1769536.67	-89.23
Wind 300 deg - Ice		-13047.82	-7533.16	-884717.36	1532463.71	-77.27
Wind 315 deg - Ice		-10653.50	-10653.50	-1251200.41	1251251.38	-63.09
Wind 330 deg - Ice		-7533.16	-13047.82	-1532412.74	884768.34	-44.61
Total Weight	30287.28			33.98	0.00	
Wind 0 deg - Service		0.00	-7082.83	-809871.94	0.00	0.00
Wind 30 deg - Service		3541.42	-6133.91	-701365.12	-404952.96	11.62
Wind 45 deg - Service		5008.32	-5008.32	-572655.99	-572689.97	16.43
Wind 60 deg - Service		6133.91	-3541.42	-404918.98	-701399.10	20.12
Wind 90 deg - Service		7082.83	0.00	33.98	-809905.92	23.24
Wind 120 deg - Service		6133.91	3541.42	404986.94	-701399.10	20.12
Wind 135 deg - Service		5008.32	5008.32	572723.95	-572689.97	16.43
Wind 150 deg - Service		3541.42	6133.91	701433.09	-404952.96	11.62
Wind 180 deg - Service		0.00	7082.83	809939.91	0.00	0.00
Wind 210 deg - Service		-3541.42	6133.91	701433.09	404952.96	-11.62
Wind 225 deg - Service		-5008.32	5008.32	572723.95	572689.97	-16.43
Wind 240 deg - Service		-6133.91	3541.42	404986.94	701399.10	-20.12
Wind 270 deg - Service		-7082.83	0.00	33.98	809905.92	-23.24
Wind 300 deg - Service		-6133.91	-3541.42	-404918.98	701399.10	-20.12
Wind 315 deg - Service		-5008.32	-5008.32	-572655.99	572689.97	-16.43

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 330 deg - Service		-3541.42	-6133.91	-701365.12	404952.96	-11.62

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 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service

Comb. No.	Description
50	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	168.28 - 130.5	Pole	Max Tension	43	0.07	0.00	0.05
			Max. Compression	18	-10232.62	0.00	0.00
			Max. Mx	6	-6136.10	-230978.40	-0.97
			Max. My	10	-6136.09	0.00	-230978.61
			Max. Vy	6	10627.81	-230978.40	-0.97
			Max. Vx	10	10627.82	0.00	-230978.61
			Max. Torque	23			0.02
L2	130.5 - 84.55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-16376.05	0.00	0.00
			Max. Mx	6	-11748.20	-773299.31	-3.38
			Max. My	10	-11748.18	0.00	-773300.20
			Max. Vy	6	13420.96	-773299.31	-3.38
			Max. Vx	10	13420.97	0.00	-773300.20
			Max. Torque	23			0.18
L3	84.55 - 43.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-23985.56	0.00	-50.97
			Max. Mx	6	-18881.17	-1362167.06	-35.32
			Max. My	10	-18881.16	0.00	-1362202.68
			Max. Vy	6	15835.78	-1362167.06	-35.32
			Max. Vx	10	15835.79	0.00	-1362202.68
			Max. Torque	23			-89.34
L4	43.66 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-36027.94	0.00	-50.97
			Max. Mx	6	-30270.44	-2196992.89	-35.70
			Max. My	10	-30270.44	0.00	-2197028.95
			Max. Vy	6	18160.16	-2196992.89	-35.70
			Max. Vx	10	18160.16	0.00	-2197028.95
			Max. Torque	31			89.08

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	27	36027.94	0.00	-15066.34
	Max. H_x	14	30287.28	18132.05	-0.00
	Max. H_z	2	30287.28	0.00	18132.05
	Max. M_x	2	2196956.83	0.00	18132.05
	Max. M_z	6	2196992.89	-18132.05	-0.00
	Max. Torsion	31	88.98	15066.34	0.00

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. Vert	1	30287.28	0.00	0.00
	Min. H_x	6	30287.28	-18132.05	-0.00
	Min. H_z	10	30287.28	0.00	-18132.05
	Min. M_x	10	-2197028.95	0.00	-18132.05
	Min. M_z	14	-2196992.89	18132.05	-0.00
	Min. Torsion	23	-88.98	-15066.34	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	30287.28	0.00	0.00	33.98	0.00	0.00
Dead+Wind 0 deg - No Ice	30287.28	0.00	-18132.05	-2196956.83	0.00	0.00
Dead+Wind 30 deg - No Ice	30287.28	9066.03	-15702.82	-1902617.94	-1098497.61	29.65
Dead+Wind 45 deg - No Ice	30287.28	12821.30	-12821.30	-1553474.56	-1553510.24	41.89
Dead+Wind 60 deg - No Ice	30287.28	15702.82	-9066.03	-1098461.99	-1902653.75	51.28
Dead+Wind 90 deg - No Ice	30287.28	18132.05	0.00	35.69	-2196992.89	59.24
Dead+Wind 120 deg - No Ice	30287.28	15702.82	9066.03	1098533.55	-1902654.07	51.33
Dead+Wind 135 deg - No Ice	30287.28	12821.30	12821.30	1553546.30	-1553510.61	41.89
Dead+Wind 150 deg - No Ice	30287.28	9066.03	15702.82	1902689.87	-1098497.93	29.59
Dead+Wind 180 deg - No Ice	30287.28	0.00	18132.05	2197028.95	0.00	0.00
Dead+Wind 210 deg - No Ice	30287.28	-9066.03	15702.82	1902689.87	1098497.93	-29.59
Dead+Wind 225 deg - No Ice	30287.28	-12821.30	12821.30	1553546.30	1553510.61	-41.89
Dead+Wind 240 deg - No Ice	30287.28	-15702.82	9066.03	1098533.55	1902654.07	-51.33
Dead+Wind 270 deg - No Ice	30287.28	-18132.05	0.00	35.69	2196992.89	-59.24
Dead+Wind 300 deg - No Ice	30287.28	-15702.82	-9066.03	-1098461.99	1902653.75	-51.28
Dead+Wind 315 deg - No Ice	30287.28	-12821.30	-12821.30	-1553474.56	1553510.24	-41.89
Dead+Wind 330 deg - No Ice	30287.28	-9066.03	-15702.82	-1902617.94	1098497.61	-29.65
Dead+Ice+Temp	36027.94	0.00	0.00	50.97	0.00	0.00
Dead+Wind 0 deg+Ice+Temp	36027.94	0.00	-15066.34	-1914132.26	0.00	0.00
Dead+Wind 30 deg+Ice+Temp	36027.94	7533.16	-13047.82	-1657680.87	-957093.96	44.50
Dead+Wind 45 deg+Ice+Temp	36027.94	10653.50	-10653.50	-1353480.86	-1353535.34	62.92
Dead+Wind 60 deg+Ice+Temp	36027.94	13047.82	-7533.16	-957039.63	-1657735.59	77.05
Dead+Wind 90 deg+Ice+Temp	36027.94	15066.34	-0.00	54.47	-1914187.53	88.98
Dead+Wind 120 deg+Ice+Temp	36027.94	13047.82	7533.16	957148.97	-1657736.28	77.06
Dead+Wind 135 deg+Ice+Temp	36027.94	10653.50	10653.50	1353590.60	-1353536.13	62.92
Dead+Wind 150 deg+Ice+Temp	36027.94	7533.16	13047.82	1657791.00	-957094.64	44.48
Dead+Wind 180 deg+Ice+Temp	36027.94	0.00	15066.34	1914242.79	0.00	0.00
Dead+Wind 210 deg+Ice+Temp	36027.94	-7533.16	13047.82	1657791.00	957094.64	-44.48
Dead+Wind 225 deg+Ice+Temp	36027.94	-10653.50	10653.50	1353590.60	1353536.13	-62.92
Dead+Wind 240 deg+Ice+Temp	36027.94	-13047.82	7533.16	957148.97	1657736.28	-77.06
Dead+Wind 270 deg+Ice+Temp	36027.94	-15066.34	-0.00	54.47	1914187.53	-88.98
Dead+Wind 300 deg+Ice+Temp	36027.94	-13047.82	-7533.16	-957039.63	1657735.59	-77.05
Dead+Wind 315 deg+Ice+Temp	36027.94	-10653.50	-10653.50	-1353480.86	1353535.34	-62.92
Dead+Wind 330 deg+Ice+Temp	36027.94	-7533.16	-13047.82	-1657680.87	957093.96	-44.50
Dead+Wind 0 deg - Service	30287.28	0.00	-7082.84	-860382.42	0.00	0.00
Dead+Wind 30 deg - Service	30287.28	3541.42	-6133.91	-745125.99	-430219.64	11.68
Dead+Wind 45 deg - Service	30287.28	5008.32	-5008.32	-608386.20	-608422.44	16.51
Dead+Wind 60 deg - Service	30287.28	6133.91	-3541.42	-430183.41	-745162.25	20.21
Dead+Wind 90 deg - Service	30287.28	7082.84	0.00	36.24	-860418.72	23.34
Dead+Wind 120 deg - Service	30287.28	6133.91	3541.42	430255.93	-745162.30	20.23
Dead+Wind 135 deg - Service	30287.28	5008.32	5008.32	608458.74	-608422.50	16.51
Dead+Wind 150 deg - Service	30287.28	3541.42	6133.91	745198.57	-430219.69	11.66
Dead+Wind 180 deg - Service	30287.28	0.00	7082.84	860455.02	0.00	0.00
Dead+Wind 210 deg - Service	30287.28	-3541.42	6133.91	745198.57	430219.69	-11.66
Dead+Wind 225 deg - Service	30287.28	-5008.32	5008.32	608458.74	608422.50	-16.51

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 - Service	30287.28	-6133.91	3541.42	430255.93	745162.30	-20.23
Dead+Wind 270 deg - Service	30287.28	-7082.84	0.00	36.24	860418.72	-23.34
Dead+Wind 300 deg - Service	30287.28	-6133.91	-3541.42	-430183.41	745162.25	-20.21
Dead+Wind 315 deg - Service	30287.28	-5008.32	-5008.32	-608386.20	608422.44	-16.51
Dead+Wind 330 deg - Service	30287.28	-3541.42	-6133.91	-745125.99	430219.64	-11.68

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-30287.28	0.00	0.00	30287.28	0.00	0.000%
2	0.00	-30287.28	-18132.05	0.00	30287.28	18132.05	0.000%
3	9066.03	-30287.28	-15702.82	-9066.03	30287.28	15702.82	0.000%
4	12821.30	-30287.28	-12821.30	-12821.30	30287.28	12821.30	0.000%
5	15702.82	-30287.28	-9066.03	-15702.82	30287.28	9066.03	0.000%
6	18132.05	-30287.28	0.00	-18132.05	30287.28	-0.00	0.000%
7	15702.82	-30287.28	9066.03	-15702.82	30287.28	-9066.03	0.000%
8	12821.30	-30287.28	12821.30	-12821.30	30287.28	-12821.30	0.000%
9	9066.03	-30287.28	15702.82	-9066.03	30287.28	-15702.82	0.000%
10	0.00	-30287.28	18132.05	0.00	30287.28	-18132.05	0.000%
11	-9066.03	-30287.28	15702.82	9066.03	30287.28	-15702.82	0.000%
12	-12821.30	-30287.28	12821.30	12821.30	30287.28	-12821.30	0.000%
13	-15702.82	-30287.28	9066.03	15702.82	30287.28	-9066.03	0.000%
14	-18132.05	-30287.28	0.00	18132.05	30287.28	-0.00	0.000%
15	-15702.82	-30287.28	-9066.03	15702.82	30287.28	9066.03	0.000%
16	-12821.30	-30287.28	-12821.30	12821.30	30287.28	12821.30	0.000%
17	-9066.03	-30287.28	-15702.82	9066.03	30287.28	15702.82	0.000%
18	0.00	-36027.94	0.00	0.00	36027.94	0.00	0.000%
19	0.00	-36027.94	-15066.33	0.00	36027.94	15066.34	0.000%
20	7533.16	-36027.94	-13047.82	-7533.16	36027.94	13047.82	0.000%
21	10653.50	-36027.94	-10653.50	-10653.50	36027.94	10653.50	0.000%
22	13047.82	-36027.94	-7533.16	-13047.82	36027.94	7533.16	0.000%
23	15066.33	-36027.94	0.00	-15066.34	36027.94	0.00	0.000%
24	13047.82	-36027.94	7533.16	-13047.82	36027.94	-7533.16	0.000%
25	10653.50	-36027.94	10653.50	-10653.50	36027.94	-10653.50	0.000%
26	7533.16	-36027.94	13047.82	-7533.16	36027.94	-13047.82	0.000%
27	0.00	-36027.94	15066.33	0.00	36027.94	-15066.34	0.000%
28	-7533.16	-36027.94	13047.82	7533.16	36027.94	-13047.82	0.000%
29	-10653.50	-36027.94	10653.50	10653.50	36027.94	-10653.50	0.000%
30	-13047.82	-36027.94	7533.16	13047.82	36027.94	-7533.16	0.000%
31	-15066.33	-36027.94	0.00	15066.34	36027.94	0.00	0.000%
32	-13047.82	-36027.94	-7533.16	13047.82	36027.94	7533.16	0.000%
33	-10653.50	-36027.94	-10653.50	10653.50	36027.94	10653.50	0.000%
34	-7533.16	-36027.94	-13047.82	7533.16	36027.94	13047.82	0.000%
35	0.00	-30287.28	-7082.83	0.00	30287.28	7082.84	0.000%
36	3541.42	-30287.28	-6133.91	-3541.42	30287.28	6133.91	0.000%
37	5008.32	-30287.28	-5008.32	-5008.32	30287.28	5008.32	0.000%
38	6133.91	-30287.28	-3541.42	-6133.91	30287.28	3541.42	0.000%
39	7082.83	-30287.28	0.00	-7082.84	30287.28	-0.00	0.000%
40	6133.91	-30287.28	3541.42	-6133.91	30287.28	-3541.42	0.000%
41	5008.32	-30287.28	5008.32	-5008.32	30287.28	-5008.32	0.000%
42	3541.42	-30287.28	6133.91	-3541.42	30287.28	-6133.91	0.000%
43	0.00	-30287.28	7082.83	0.00	30287.28	-7082.84	0.000%
44	-3541.42	-30287.28	6133.91	3541.42	30287.28	-6133.91	0.000%
45	-5008.32	-30287.28	5008.32	5008.32	30287.28	-5008.32	0.000%
46	-6133.91	-30287.28	3541.42	6133.91	30287.28	-3541.42	0.000%
47	-7082.83	-30287.28	0.00	7082.84	30287.28	-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
48	-6133.91	-30287.28	-3541.42	6133.91	30287.28	3541.42	0.000%
49	-5008.32	-30287.28	-5008.32	5008.32	30287.28	5008.32	0.000%
50	-3541.42	-30287.28	-6133.91	3541.42	30287.28	6133.91	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00001620
3	Yes	6	0.00000001	0.00038019
4	Yes	6	0.00000001	0.00040171
5	Yes	6	0.00000001	0.00037992
6	Yes	5	0.00000001	0.00001708
7	Yes	6	0.00000001	0.00038027
8	Yes	6	0.00000001	0.00040172
9	Yes	6	0.00000001	0.00038001
10	Yes	5	0.00000001	0.00001620
11	Yes	6	0.00000001	0.00038001
12	Yes	6	0.00000001	0.00040172
13	Yes	6	0.00000001	0.00038027
14	Yes	5	0.00000001	0.00001708
15	Yes	6	0.00000001	0.00037992
16	Yes	6	0.00000001	0.00040171
17	Yes	6	0.00000001	0.00038019
18	Yes	4	0.00000001	0.00000001
19	Yes	6	0.00000001	0.00010782
20	Yes	7	0.00000001	0.00009308
21	Yes	7	0.00000001	0.00010177
22	Yes	7	0.00000001	0.00009299
23	Yes	6	0.00000001	0.00010783
24	Yes	7	0.00000001	0.00009311
25	Yes	7	0.00000001	0.00010178
26	Yes	7	0.00000001	0.00009302
27	Yes	6	0.00000001	0.00010782
28	Yes	7	0.00000001	0.00009302
29	Yes	7	0.00000001	0.00010178
30	Yes	7	0.00000001	0.00009311
31	Yes	6	0.00000001	0.00010783
32	Yes	7	0.00000001	0.00009299
33	Yes	7	0.00000001	0.00010177
34	Yes	7	0.00000001	0.00009308
35	Yes	4	0.00000001	0.00077401
36	Yes	5	0.00000001	0.00062292
37	Yes	5	0.00000001	0.00071398
38	Yes	5	0.00000001	0.00062219
39	Yes	4	0.00000001	0.00077425
40	Yes	5	0.00000001	0.00062322
41	Yes	5	0.00000001	0.00071409
42	Yes	5	0.00000001	0.00062249
43	Yes	4	0.00000001	0.00077414
44	Yes	5	0.00000001	0.00062249
45	Yes	5	0.00000001	0.00071409
46	Yes	5	0.00000001	0.00062322
47	Yes	4	0.00000001	0.00077425
48	Yes	5	0.00000001	0.00062219

49	Yes	5	0.00000001	0.00071398
50	Yes	5	0.00000001	0.00062292

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168.28 - 130.5	60.746	43	3.2846	0.0001
L2	134.16 - 84.55	38.363	43	2.8541	0.0001
L3	89.11 - 43.66	16.076	43	1.7779	0.0001
L4	49 - 0	4.701	43	0.8895	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169.00	12' Low Profile Platform	43	60.746	3.2846	0.0001	17517
160.00	12' Low Profile Platform	43	55.106	3.1990	0.0001	10577
140.00	12' Low Profile Platform	43	41.957	2.9492	0.0001	3095
75.00	Side Arm Mount	43	11.144	1.4039	0.0001	2378

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168.28 - 130.5	154.528	10	8.3625	0.0003
L2	134.16 - 84.55	97.689	10	7.2695	0.0003
L3	89.11 - 43.66	40.991	10	4.5330	0.0003
L4	49 - 0	11.997	10	2.2697	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169.00	12' Low Profile Platform	10	154.528	8.3625	0.0003	7130
160.00	12' Low Profile Platform	10	140.210	8.1486	0.0003	4304
140.00	12' Low Profile Platform	10	106.821	7.5148	0.0003	1255
75.00	Side Arm Mount	10	28.425	3.6379	0.0003	941

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	168.28 - 130.5 (1)	TP25.3135x19x0.1875	37.78	168.28	232.0	2.773	14.5891	-9182.84	40462.30	0.227
L2	130.5 - 84.55 (2)	TP32.4932x24.3269x0.25	49.61	168.28	180.6	4.577	24.9894	-11748.20	114380.00	0.103
L3	84.55 - 43.66 (3)	TP38.7021x31.2426x0.3125	45.45	168.28	151.6	6.495	37.2084	-18881.20	241651.00	0.078
L4	43.66 - 0 (4)	TP45.25x37.2007x0.375	49.00	168.28	126.8	9.294	53.4125	-30270.40	496400.00	0.061

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	168.28 - 130.5 (1)	TP25.3135x19x0.1875	214676.67	-29.185	39.000	0.748	0.00	0.000	39.000	0.000
L2	130.5 - 84.55 (2)	TP32.4932x24.3269x0.25	773301.67	-47.789	39.000	1.225	0.00	0.000	39.000	0.000
L3	84.55 - 43.66 (3)	TP38.7021x31.2426x0.3125	1362200.00	-47.482	39.000	1.217	0.00	0.000	39.000	0.000
L4	43.66 - 0 (4)	TP45.25x37.2007x0.375	2197025.00	-44.597	39.000	1.144	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	168.28 - 130.5 (1)	TP25.3135x19x0.1875	0.227	0.748	0.000	0.975 ✔	1.333	H1-3 ✔
L2	130.5 - 84.55 (2)	TP32.4932x24.3269x0.25	0.103	1.225	0.000	1.328 ✔	1.333	H1-3 ✔
L3	84.55 - 43.66 (3)	TP38.7021x31.2426x0.3125	0.078	1.217	0.000	1.296 ✔	1.333	H1-3 ✔
L4	43.66 - 0 (4)	TP45.25x37.2007x0.375	0.061	1.144	0.000	1.204 ✔	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	168.28 - 130.5	Pole	TP25.3135x19x0.1875	1	-9182.84	53936.24	73.2	Pass
L2	130.5 - 84.55	Pole	TP32.4932x24.3269x0.25	2	-11748.20	152468.53	99.6	Pass
L3	84.55 - 43.66	Pole	TP38.7021x31.2426x0.3125	3	-18881.20	322120.77	97.2	Pass
L4	43.66 - 0	Pole	TP45.25x37.2007x0.375	4	-30270.40	661701.17	90.4	Pass

ERITower	Job: 170' EEI Monopole	Page: 19 of 19
URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Project: Bristol, CT	Date: 14:44:02 12/12/05
	Client: Verizon Wireless	Designed by: Jed Kiernan

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
							Summary	
						Pole (L2)	99.6	Pass
						RATING =	**99.6**	**Pass**

Program Version 3.0.0.17 - 7/15/2004 File:P:/F08/ERI Files/170' EEI-Bristol.eri

ANCHOR BOLT AND BASE PLATE ANALYSIS

ANCHOR BOLT AND BASE PLATE ANALYSIS

Input Data

Tower Reactions:

Overturning Moment:	$OM := 2198 \cdot ft \cdot kips$	*user input*
Shear Force:	$Shear := 18.2 \cdot kips$	*user input*
Axial Force:	$Axial := 30.3 \cdot kips$	*user input*

Anchor Bolt Data:

Use ASTM 615 Grade 75

Number of Anchor Bolts = N	$N := 12$	*user input*
Diameter of Bolt Circle:	$D_{bc} := 54in$	*user input*
Bolt "Column" Distance:	$l := 3in$	*user input*
Bolt Ultimate Strength:	$F_u := 100 \cdot ksi$	*user input*
Bolt Yield Strength:	$Fy := 75 \cdot ksi$	*user input*
Bolt Modulus:	$E := 29000 \cdot ksi$	*user input*
Thickness Of Anchor Bolts	$D := 2.25in$	*user input*
Threads per Inch:	$n := 4.5$	*user input*

Base Plate Data:

Plate Yield Strength:	$Fy_{bp} := 60 \cdot ksi$	*user input*
Base Plate Thickness:	$PlateThickness := 2 \cdot in$	*user input*
Base Plate Diameter:	$D_{bp} := 60 \cdot in$	*user input*
Outer Pole Diameter:	$D_{pole} := 45.25in$	*user input*

Geometric Layout Data:

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

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

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

$$d_i := \left| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 13.50\,in$ $d_7 = -13.50\,in$

$d_2 = 23.38\,in$ $d_8 = -23.38\,in$

$d_3 = 27.00\,in$ $d_9 = -27.00\,in$

$d_4 = 23.38\,in$ $d_{10} = -23.38\,in$

$d_5 = 13.50\,in$ $d_{11} = -13.50\,in$

$d_6 = 0.00\,in$ etc.

Critical Distances For Bending in Plate:

Outer Pole Radius: $R_{pole} := \frac{D_{pole}}{2}$ $R_{pole} = 22.62\,in$

Moment Arms of Bolts about Neutral Axis: $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00\,in$ $MA_7 = 0.00\,in$

$MA_2 = 0.76\,in$ $MA_8 = 0.00\,in$

$MA_3 = 4.38\,in$ $MA_9 = 0.00\,in$

$MA_4 = 0.76\,in$ $MA_{10} = 0.00\,in$

$MA_5 = 0.00\,in$ $MA_{11} = 0.00\,in$

$MA_6 = 0.00\,in$ etc.

Effective Width of Baseplate for Bending: $EffectiveWidth := 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2}$ $EffectiveWidth = 39.40\,in$

Anchor Bolt Analysis:

Polar Moment of Inertia I_p:

$$I_p := \sum_i \left(d_i\right)^2 \qquad I_p = 4.374 \times 10^3\,\text{in}^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 3.976\,\text{in}^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot\text{in}}{n}\right)^2 \qquad A_n = 3.248\,\text{in}^2$$

Net Diameter:

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

Radius of Gyration of Bolt:

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

Section Modulus of Bolt:

$$S_x := \frac{\pi\cdot D_n^{\,3}}{32} \qquad S_x = 0.826\,\text{in}^3$$

Anchor Bolt Bending Stress:

Maximum Applied Bending:

$$M_x := \left(\frac{\text{Shear}}{N}\right)\cdot 1 \qquad M_x = 0.379\,\text{ft}\cdot\text{kips}$$

$$f_{bx} := \frac{M_x}{S_x} \qquad f_{bx} = 5.5\,\text{ksi}$$

Allowable Bending

$$F_{bx} := 1.33\cdot 0.60\cdot Fy \qquad F_{bx} = 59.8\,\text{ksi}$$

Note: 1.33 increase allowed per TIA/EIA

Check Tensile Forces:

Allowable Tensile Force:

$$AllowableTension := 1.33 \cdot (0.33 \cdot A_g \cdot F_u) \qquad AllowableTension = 174.5\,kips$$

Note: 1.33 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{OM \cdot R_{bc}}{I_p} - \frac{Axial}{N} \qquad MaxTension = 160.3\,kips$$

Check Stresses:

$$\frac{MaxTension}{AllowableTension} = 0.92$$

$$Condition := if\left(\frac{MaxTension}{AllowableTension} \le 1.00, "OK", "Overstressed"\right)$$

Condition = "OK"

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 and remove bending stresses if a combined stress analysis is not required:

$$l := \begin{cases} l & \text{if } l > 2 \cdot D_n \\ 0.00\,\text{in} & \text{otherwise} \end{cases} \qquad l = 0.00\,\text{in}$$

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

Allowable Compressive Force:

$$K := 0.65$$

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

$$F_a := \begin{cases} \left[1 - \frac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^{\,2}}\right] \cdot Fy \\ \hline \frac{5}{3} + \frac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \frac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^{\,3}} \end{cases} \text{ if } \frac{K \cdot l}{r} \le C_c \qquad F_a = 45.0\,\text{ksi}$$

$$\frac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} \text{ if } \frac{K \cdot l}{r} > C_c$$

$$F_a := 1.33 \cdot F_a \quad \text{Note: 1.33 increase allowed per TIA/EIA} \qquad F_a = 59.9\,\text{ksi}$$

Applied Compressive Force:

$$\text{MaxCompression} := \frac{OM \cdot R_{bc}}{I_p} + \frac{\text{Axial}}{N} \qquad \text{MaxCompression} = 165.3\,\text{kips}$$

$$f_a := \frac{\text{MaxCompression}}{A_n} \qquad f_a = 50.9\,\text{ksi}$$

Check Combined Stresses:

$$\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} = 0.85$$

$$\text{Condition} := \text{if}\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right) \qquad \boxed{\text{Condition} = \text{"OK"}}$$

Base Plate Analysis:

Force from Bolt(s):

$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$$

$C_1 = 83.9\,kips$ $C_7 = -78.9\,kips$

$C_2 = 143.5\,kips$ $C_8 = -138.5\,kips$

$C_3 = 165.3\,kips$ $C_9 = -160.3\,kips$

$C_4 = 143.5\,kips$ $C_{10} = -138.5\,kips$

$C_5 = 83.9\,kips$ $C_{11} = -78.9\,kips$

$C_6 = 2.5\,kips$ etc.

Bending Stress in Plate:

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{EffectiveWidth \cdot PlateThickness^2} \qquad f_{bp} = 35.8\,ksi$$

Check Stresses:

$$\frac{f_{bp}}{1.33 \cdot 0.75 Fy_{bp}} = 0.60$$

$$Condition := if\left(\frac{f_{bp}}{1.33 \cdot 0.75 Fy_{bp}} < 1.00, "OK", "Overstressed"\right)$$

Condition = "OK"

General Power Density

Site Name: Bristol West II
Tower Height: 170 Ft. VZW @ 140 Ft.

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	1900	3	256	768	140	0.0141	1	1.41%
Verizon	800	9	200	1800	140	0.0330	0.5673	5.82%
Sprint	1900	11	122	1342	160	0.0189	1	1.89%
Cingular	880	6	296	1776	169	0.0224	0.5673	3.94%
Cingular	1900	3	427	1281	169	0.0161	1	1.61%
Total Percentage of Maximum Permissible Exposure								**14.67%**

*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

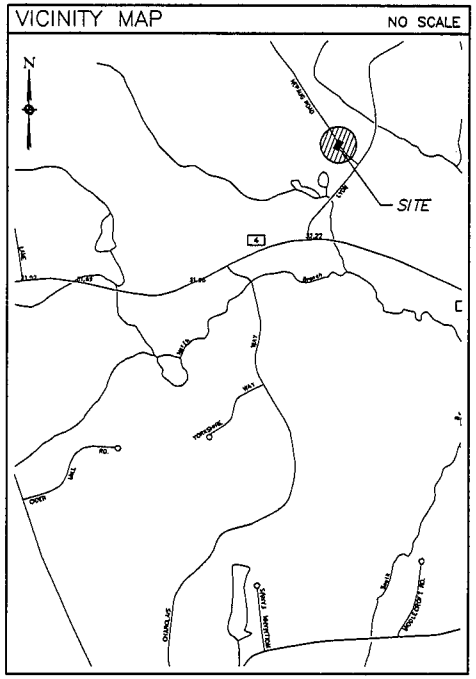
CELLCO PARTNERSHIP
DBA

verizon wireless

BURLINGTON WEST

12 NEPAUG ROAD
BURLINGTON, CONNECTICUT 06013

VICINITY MAP — NO SCALE



PROJECT SUMMARY

SITE NAME:	BURLINGTON WEST
SITE ADDRESS:	12 NEPAUG ROAD BURLINGTON, CONNECTICUT 06013
CONTACT PERSON:	CELLCO PARTNERSHIP DBA VERIZON WIRELESS SANDY CARTER (860) 603-8219
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, SUITE 3B ROCKY HILL, CT 06067
SURVEY:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B 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
SC-2	COMPOUND PLAN AND TOWER ELEVATION

CELLCO PARTNERSHIP
DBA
verizon wireless

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

A&E SEAL

PROJECT NO: 36930940

JOB NO: VZ1-160

DRAWN BY: KAP

CHECKED BY:

ISSUED FOR

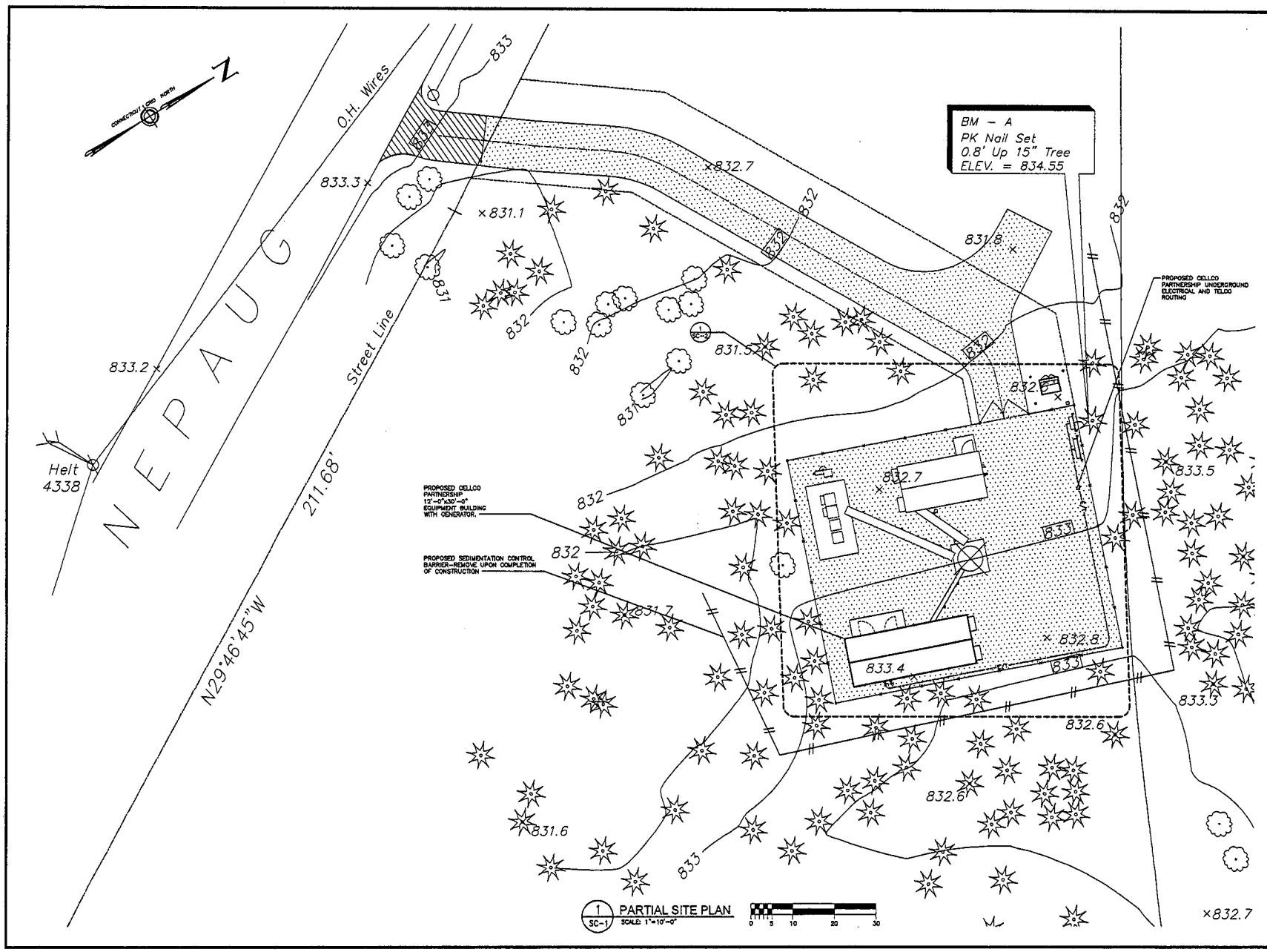
11-21-05	REVIEW
12-09-05	SITING COUNCIL

BURLINGTON WEST
12 NEPAUG ROAD
BURLINGTON, CONNECTICUT

SCALE: AS NOTED

TITLE SHEET-
GENERAL NOTES
AND LEGEND

T-1



CELLCO PARTNERSHIP
DBA
verizon wireless

AME FIRM
AMEC EARTH & ENVIRONMENTAL
500 ENTERPRISE DRIVE
SUITE 3B
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

AME SEAL

PROJECT NO:	36930940
JOB NO:	VZ1–180
DRAWN BY:	KAP
CHECKED BY:	

ISSUED FOR

11-21-05	REVIEW
12-09-05	SITING COUNCIL

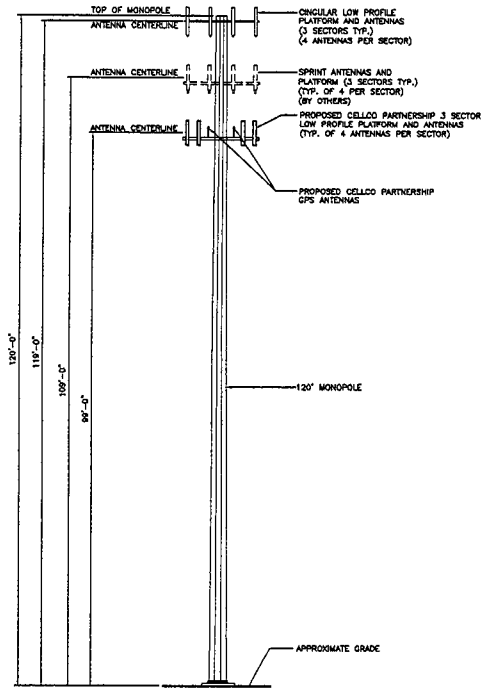
BURLINGTON
WEST

12 NEPAUG ROAD
BURLINGTON, CONNECTICUT

SCALE: AS NOTED

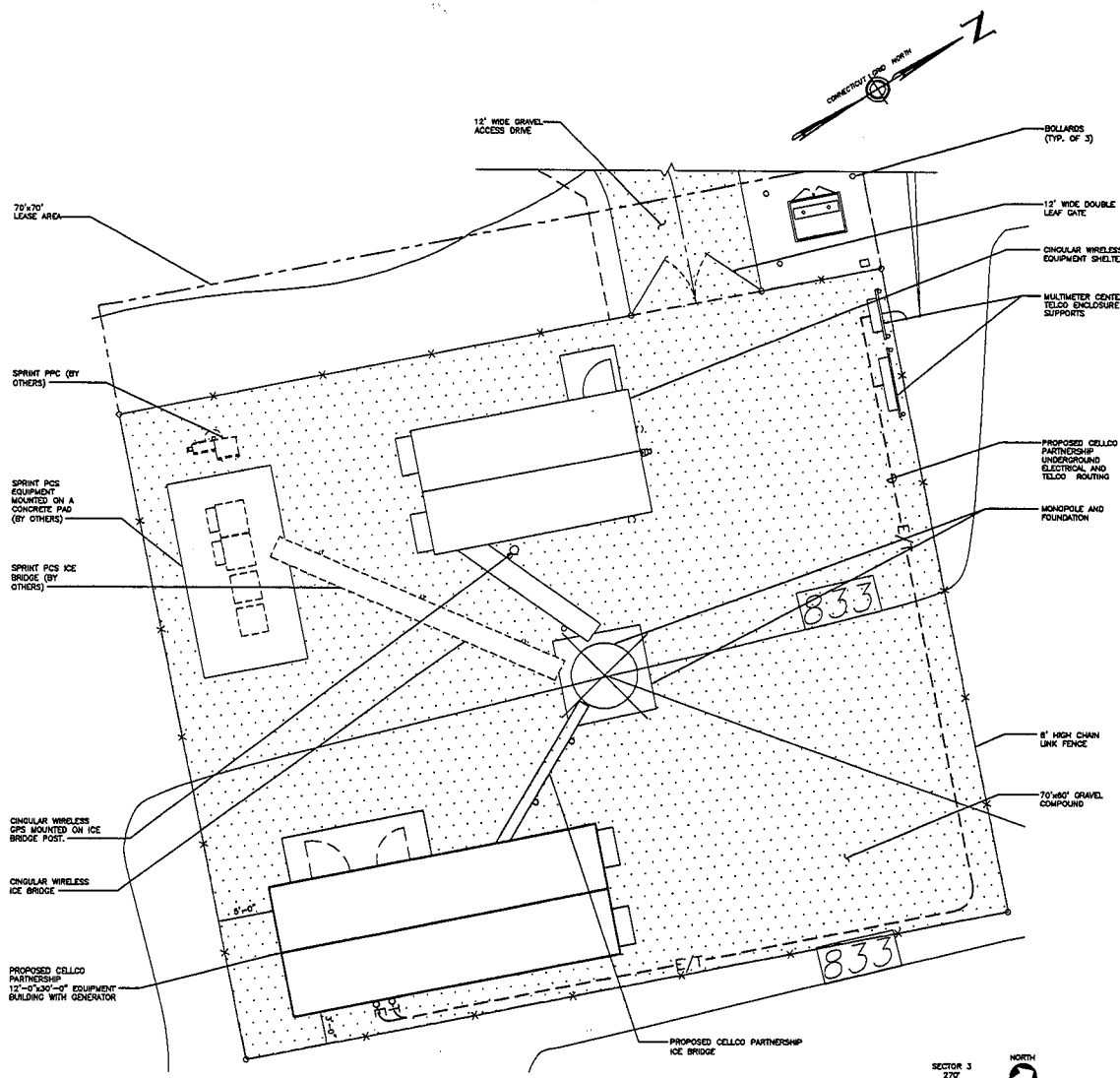
PARTIAL SITE PLAN

SC-1



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

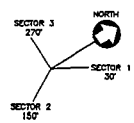
0 5 10 20 30



1 SC-2 COMPOUND PLAN
SCALE: 1"=5'-0"

0 2.5 5 10 15

LATITUDE: 41°-46'-56.86" (NAD 83)
LONGITUDE: 72°-59'-22.68" (NAD 83)



ANTENNA ORIENTATION KEY

CELLCO PARTNERSHIP
DBA
verizon wireless

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

A&E SEAL

PROJECT NO: 36930940
JOB NO: VZ1-160
DRAWN BY: KAP
CHECKED BY:

ISSUED FOR	
11-21-05	REVIEW
12-09-05	SITING COUNCIL

BURLINGTON WEST
12 NEPAUG ROAD
BURLINGTON, CONNECTICUT

SCALE: AS NOTED

COMPOUND PLAN AND TOWER ELEVATION

SC-2

URS

December 9, 2005

Ms. Pamela Katz, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Reference: **Telecommunications Facility Modification**
Cellco Partnership
12 Nepaug Road
Burlington, Connecticut
VZ1 160/36930947.00000

Dear Ms. Katz:

URS Corporation (URS) conducted a structural review of the proposed Cingular 120' monopole to be located at 12 Nepaug Road in Burlington, Connecticut. The purpose of our review was to evaluate the effect of the proposed Cellco Partnership antenna addition on the monopole structure. The monopole structure design documents were prepared by Engineered Endeavors Incorporated, EEI job number 13749-E02 approved October 27, 2005. The tower was designed to support five (5) telecommunication carriers between elevation 119' and 79'. The design considered twelve (12) 4 sf panel antennas on low profile platforms for each of the five carriers. The tower is currently approved for Cingular antennas mounted on a low profile platform at the 119' elevation and Sprint PCS antennas mounted on a low profile platform at the 109' elevation. The proposed Verizon Wireless addition considered in this review is as follows:

Antenna and Mount Modification	Carrier	Antenna Center Elevation
(4) Antel LPA-80090/4CF and (8) Antel LPA 185090/8CF-2 antennas on low profile platform with 12 1 5/8" coaxial cables inside the monopole.	Cellco Partenership	99' A.G.L.

The results of this review indicate the structure to be in compliance with the loading conditions and the material and member sizes for the monopole structure and its foundation. The monopole is considered feasible with the applicable TIA/EIA-222-F wind load classification specified and proposed Cellco Partnership Wireless and existing antenna loading. The structure and its foundation are in compliance with the BOCA 1996 and Connecticut State Building Code supplement 1999 including the latest amendments.

If you should have any questions, please call.

Sincerely,

URS Corporation AES

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

RAS/jek

cc: Mark Gauger – Cellco Partnership
Rachel A. Mayo - Robinson & Cole LLP
Alitz Abadjian - URS
Douglas Roberts, AIA - URS
Ignacio C. Artaiz, AIA - URS
CF/Book

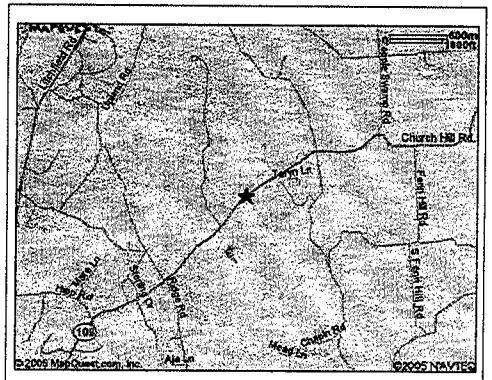
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Tel: 860.529.8882
Fax: 860.529.3991

Site Name: Burlington West
Tower Height: 120 Ft. VZW @ 99 Ft.

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	1900	3	256	768	99	0.0282	1	2.82%
Verizon	800	9	200	1800	99	0.0660	1	6.60%
Sprint	1900	11	122	1342	109	0.0406	1	4.06%
Cingular	880	6	296	1776	119	0.0451	0.5673	7.95%
Cingular	1900	3	427	1281	119	0.0325	1	3.25%
Total Percentage of Maximum Permissible Exposure								**24.69%**

*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



VICINITY MAP

- I-84 WEST TO EXIT 17
- CHASE PKWY (RT. 64) WEST APPROX. 8 MILES
- RIGHT ONTO RT. 6 APPROX. 1.5 MILES
- LEFT ONTO RT. 47 (WASHINGTON RD.) APPROX. 10 MILES
- LEFT ONTO RT. 109 (CALHOUN ST.)
- RT. 109 NAME CHANGES TO CHESTNUT LAND RD., APPROX. 3 MILES
- SITE IS ON THE RIGHT

DRIVING DIRECTIONS FROM HARTFORD, CT

CELLCO PARTNERSHIP
d/b/a
verizon WIRELESS

NEW MILFORD EAST
399 CHESTNUT LAND ROAD
NEW MILFORD, CT 06776
CO-LOCATION

INSTALLATION OF 30'-0" x 12'-0" PREFABRICATED EQUIPMENT SHELTER ON GRADE AND (12) PANEL ANTENNAS ON EXISTING MONOPOLE.

WORK DESCRIPTION

- STATE BUILDING CODE
- CONNECTICUT AMENDMENT - 2000
- CONNECTICUT SUPPLEMENT - 1999
- BOCA NATIONAL BUILDING CODE - 1999
- FIRE/LIFE SAFETY CODE, NFPA 101-1997
- NATIONAL ELECTRICAL CODE - 1999

CODE COMPLIANCE

SITE NAME:	NEW MILFORD EAST
SITE ADDRESS:	399 CHESTNUT LAND ROAD NEW MILFORD, CT 06776
PROPERTY MANAGER:	GLOBAL SIGNAL 301 NORTH CATTLEMEN RD SARASOTA, FL 34232 888-748-3482
APPLICANT:	CELLCO PARTNERS INC. D/B/A VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON CONTACT:	MARK GAUGER 203-494-0023
LAT (NAD 83):	41° 37' 54.92318"
LONG (NAD 83):	73° 22' 02.82670"

PROJECT INFORMATION

SHT. NO:	DESCRIPTION
T-1	TITLE SHEET
A-1	COMPOUND PLAN & ELEVATION

DRAWING INDEX

CELLCO PARTNERSHIP
d/b/a
verizon
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

On Air Engineering, LLC
88 FOUNDRY POND ROAD
COLD SPRING, NY 10516
(845) 265-3395
(845) 622-4917

LICENSURE

DAVID A. WEINPAHL, P.E.
CT LIC. NO. 22144

NO.:	DATE:	SUBMISSIONS
1	9.16.05	VERIZON REVIEW
2	12.15.05	PERMITTING/CONSTRUCTION

APPROVALS:	
PROPERTY OWNER	DATE
ZONING	DATE
CONSTRUCTION	DATE
R/F ENGINEER	DATE

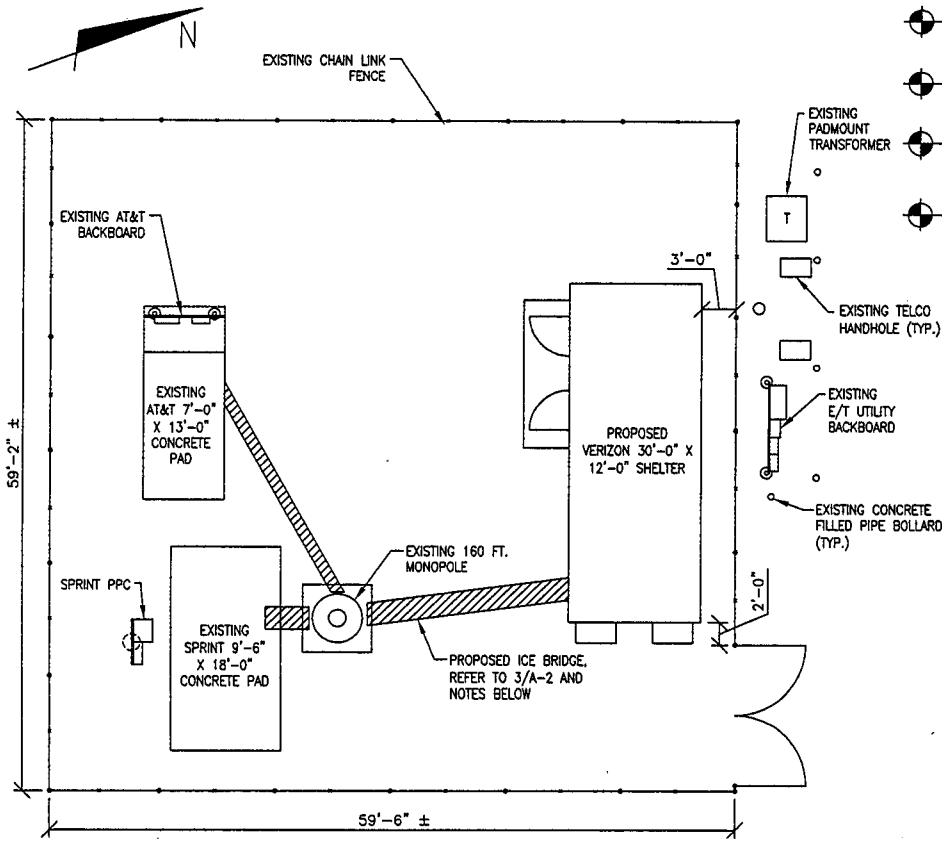
DRAWN BY:	CHECKED BY:
MJ	DW

SITE #
NEW MILFORD EAST

PROJECT INFORMATION:
GLOBAL SIGNAL CO-LOCATION
399 CHESTNUT LAND ROAD
NEW MILFORD, CT 06776

DRAWING TITLE:
TITLE SHEET

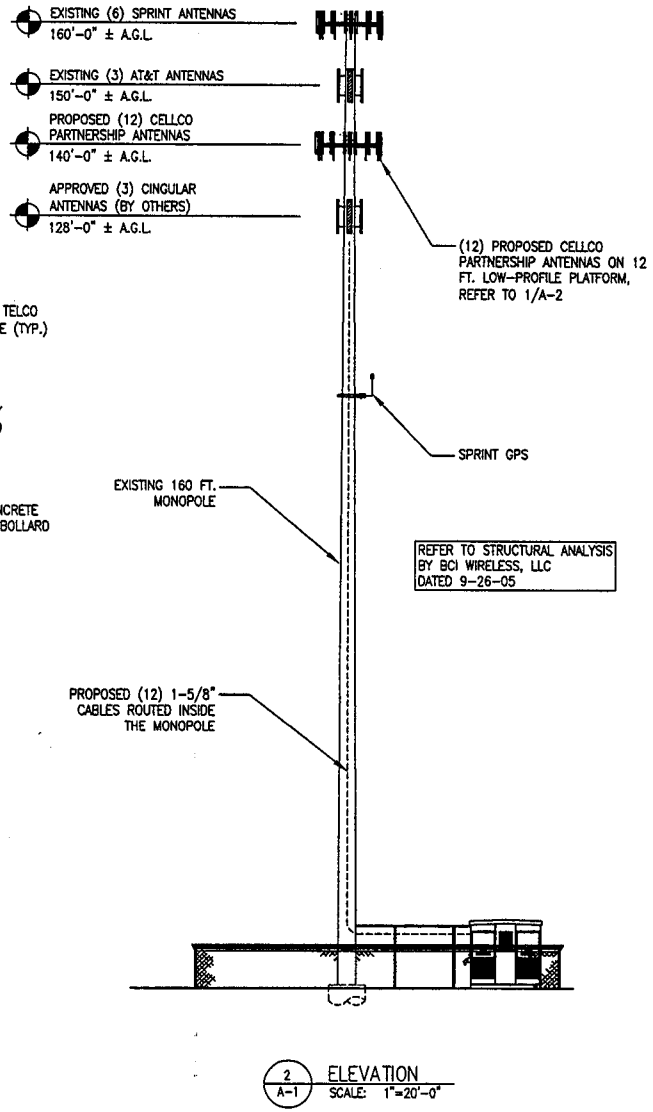
T-1



NOTES:
1. FINAL LOCATIONS FOR ALL ICE BRIDGE SUPPORT POSTS TO BE DETERMINED IN FIELD.
2. COORDINATE SUPPORT POST PIPE LENGTH WITH VERIZON WIRELESS EQUIPMENT SHELTER CABLE PORT AND TOWER ENTRY PORT

2/A-1

1/A-1 COMPOUND PLAN
SCALE: 3/32"=1'-0"



2/A-1 ELEVATION
SCALE: 1"=20'-0"

CELLCO PARTNERSHIP
d/b/a Verizon
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

On Air Engineering, LLC
88 FOUNDRY POND ROAD
COLD SPRING, NY 10516
(845) 265-3395
(845) 622-4917

LICENSURE

DAVID A. WEINPAHL, P.E.
CT LIC. NO. 22144

NO.:	DATE:	SUBMISSIONS
1	9.16.05	VERIZON REVIEW
2	12.15.05	PERMITTING/CONSTRUCTION

APPROVALS:

PROPERTY OWNER	DATE
ZONING	DATE
CONSTRUCTION	DATE
RF ENGINEER	DATE

DRAWN BY:	CHECKED BY:
MJ	DW

SITE#
NEW MILFORD EAST

PROJECT INFORMATION:
GLOBAL SIGNAL CO-LOCATION
399 CHESTNUT LAND ROAD
NEW MILFORD, CT 06776

DRAWING TITLE:
COMPOUND PLAN & ELEVATION

A-1

4076745

Structural Analysis Report

Existing 160' Tapered Monopole

Manufacturer is Engineering Endeavors Incorporated

Located in Litchfield County, CT

For

Verizon

(3017717)

Prepared by:

BCI Wireless LLC
Bradley Cook, P.Eng.

Reviewed by:

Global Signal Services LLC
Michael T. De Boer, P.E.
Senior Engineer

QC'ed By	
Initial S.S	Initial
Date 9/29/05	Date

September 26, 2005

Structural Analysis Report

Existing 160' Tapered Monopole

For

Verizon

Table of Contents

Global Signal Services LLC
3017717
September 26, 2005

INTRODUCTION

The objective of this analysis is to determine if the existing tower design is in conformance with the ANSI/TIA/EIA-222-F 1996 standard and the IBC 2003 Code requirements for the existing and proposed antenna loading. The existing tower is a 160' tapered monopole located in Litchfield County, CT. The original monopole manufacturer is Engineering Endeavors Inc., Mentor, OH. The analysis request was by **Verizon.**

The monopole program used in the analysis was written by Guymast, Inc. This program is one of the most widely accepted programs in the communications industry. The wind speed used for this analysis was 80 mph wind speed (fastest mile, 100 mph 3-sec gust) and 69.3 mph with ½" solid radial ice. The monopole, for the purpose of this analysis, is considered to be in good condition with no defects. Section sizes used in the analysis were obtained from original monopole drawings by EEI dated 06/24/03. The monopole sections are 65 ksi steel.

ANTENNA LOADING INFORMATION

EXISTING ANTENNA LOADING

- (12) DB980F65 Cellular panels at 160' with (12) 1-5/8" lines
- (6) Allgon 7750 Cellular panels at 150' with (12) 1-5/8" lines
- (3) Powerwave 7750 Cellular panels with (6) TMAs on a Low Profile Platform at 128' with (6) 1-5/8" lines

PROPOSED ANTENNAS

- (12) DB950F85E-M cellular panels with a 12 foot Low Profile Platform at 140' with (12) 1-5/8" lines

Note: Transmission lines are considered to be installed inside the monopole.

Global Signal Services LLC
3017717
September 26, 2005

RESULTS

The existing 160' tapered monopole located in Litchfield County, CT was analyzed with an 80 mph wind speed (fastest mile, 100 mph 3-sec gust) and a 69.3 mph wind speed with ½" solid radial ice per the EIA-222-F 1996 standard and IBC 2003 Code. The monopole was found to be structurally acceptable with the proposed antenna loading.

The monopole foundation was also reviewed and was found to be structurally acceptable with the proposed antenna loading.

Allowable stresses have been increased by 1/3 for wind loading conditions.

CONCLUSION

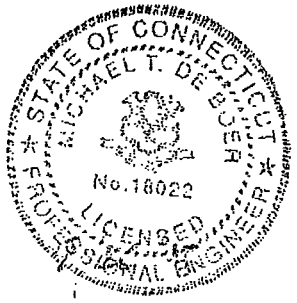
The existing 160' tapered monopole located in Litchfield County, CT was analyzed with an 80 mph wind speed (fastest mile, 100 mph 3-sec gust) and a 69.3 mph wind speed with ½" solid radial ice per the EIA-222-F 1996 standard and IBC 2003 Code. No modification is required with the proposed antenna loading.

If any other changes are proposed, another structural analysis should be performed to assure the monopole is in compliance with the current codes and standards.

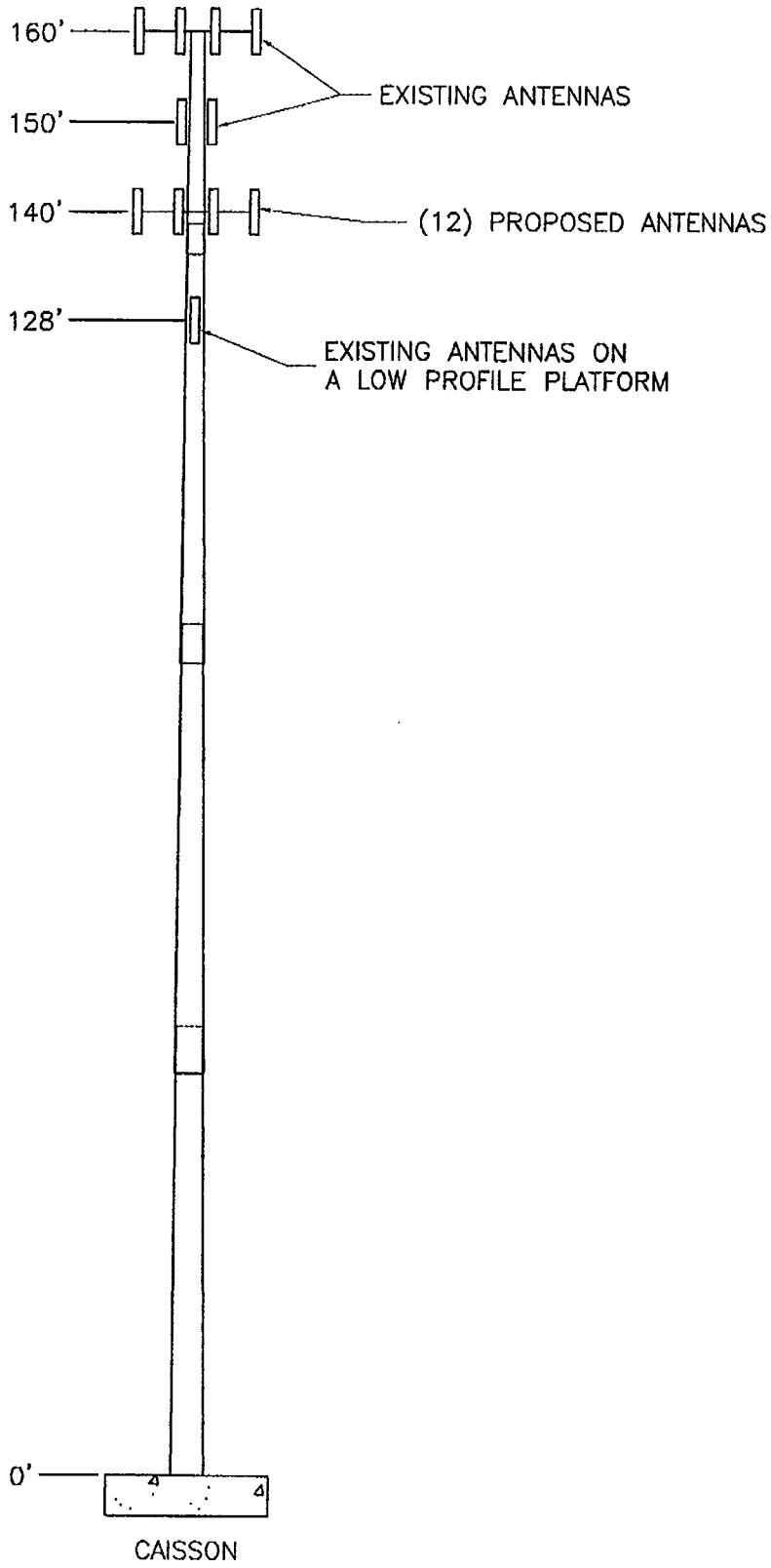
Should any further questions arise, please contact the Global Signal Services LLC Engineering Department at 941-364-8886.

Global Signal Services LLC

Michael T. De Boer, P.E.
Senior Engineer



TOWER #: 3017717



ANALYSIS DATE 9/26/2005	LEASE# 4076745	DWG. TITLE MONOPOLE PROFILE LITCHFIELD COUNTY, CT
VERIFIED BY M. DEBOER	LEGACY NUMBER CT33XC606	
	DRAFTED BY BPS	SHEET: 1 OF 1

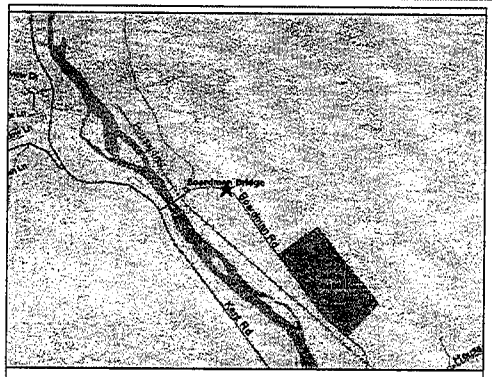
global signal℠
Meeting needs Exceeding expectations.

Site Name: New Milford East
Tower Height: 160 Ft. VZW @ 140 Ft.

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	1900	3	256	768	140	0.0141	1	1.41%
Sprint	1900	11	122	1342	160	0.0189	1	1.89%
Cingular	880	6	296	1776	128	0.0390	0.5673	6.87%
AT&T	1900	3	427	1281	150	0.0205	1	2.05%
Total Percentage of Maximum Permissible Exposure								**12.21%**

*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



VICINITY MAP

- I-84 WEST TO EXIT 15
- RIGHT AT END OF RAMP ONTO RT. 6/RT. 67 APPROX 1.4 MILES
- LEFT ONTO RT. 67 FOLLOW FOR APPROX. 14 MILES
- LEFT ONTO RT. 202
- RIGHT ONTO RAILROAD ST.
- LEFT ONTO HOUSATONIC AVE.
- NAME CHANGES TO BOARDMAN RD.
- QUARRY STONE AND GRAVEL IS ON YOUR RIGHT
- FOLLOW DIRT ACCESS ROAD TO THE RIGHT OF THE WEIGH STATION BLDG.

DRIVING DIRECTIONS FROM HARTFORD, CT

CELLCO PARTNERSHIP
d/b/a
verizon
WIRELESS

NEW MILFORD WEST
33 AKA 86 BOARDMAN RD
NEW MILFORD, CT 06776
CO-LOCATION

INSTALLATION OF 30'-0" x 12'-0" PREFABRICATED EQUIPMENT SHELTER ON GRADE AND (12) PANEL ANTENNAS ON EXISTING MONOPOLE.

WORK DESCRIPTION

- STATE BUILDING CODE
- CONNECTICUT AMENDMENT - 2000
- CONNECTICUT SUPPLEMENT - 1999
- BOCA NATIONAL BUILDING CODE - 1999
- FIRE/LIFE SAFETY CODE, NFPA 101-1997
- NATIONAL ELECTRICAL CODE - 1999

CODE COMPLIANCE

SITE NAME:	NEW MILFORD WEST
SITE ADDRESS:	33 AKA 86 BOARDMAN RD NEW MILFORD, CT 06776
PROPERTY OWNER:	QUARRY STONE & GRAVEL 33 BOARDMAN RD NEW MILFORD, CT 06776
APPLICANT:	CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON CONTACT:	MARK GAUGER 203-494-0023
LAT (NAD 83):	41° 35' 57.88"
LONG (NAD 83):	73° 26' 14.93"

PROJECT INFORMATION

SHT. NO:	DESCRIPTION
T-1	TITLE SHEET
A-1	COMPOUND PLAN & ELEVATION

DRAWING INDEX

CELLCO PARTNERSHIP
d/b/a
verizon
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

On Air Engineering, LLC
88 FOUNDRY POND ROAD
COLD SPRING, NY 10516
(845) 265-3395
(845) 622-4917

LICENSURE

DAVID A. WEINPAHL, P.E.
CT LIC. NO. 22144

NO.:	DATE:	SUBMISSIONS
1	9-16-05	VERIZON REVIEW

APPROVALS:	
PROPERTY OWNER	DATE
ZONING	DATE
CONSTRUCTION	DATE
R.F. ENGINEER	DATE

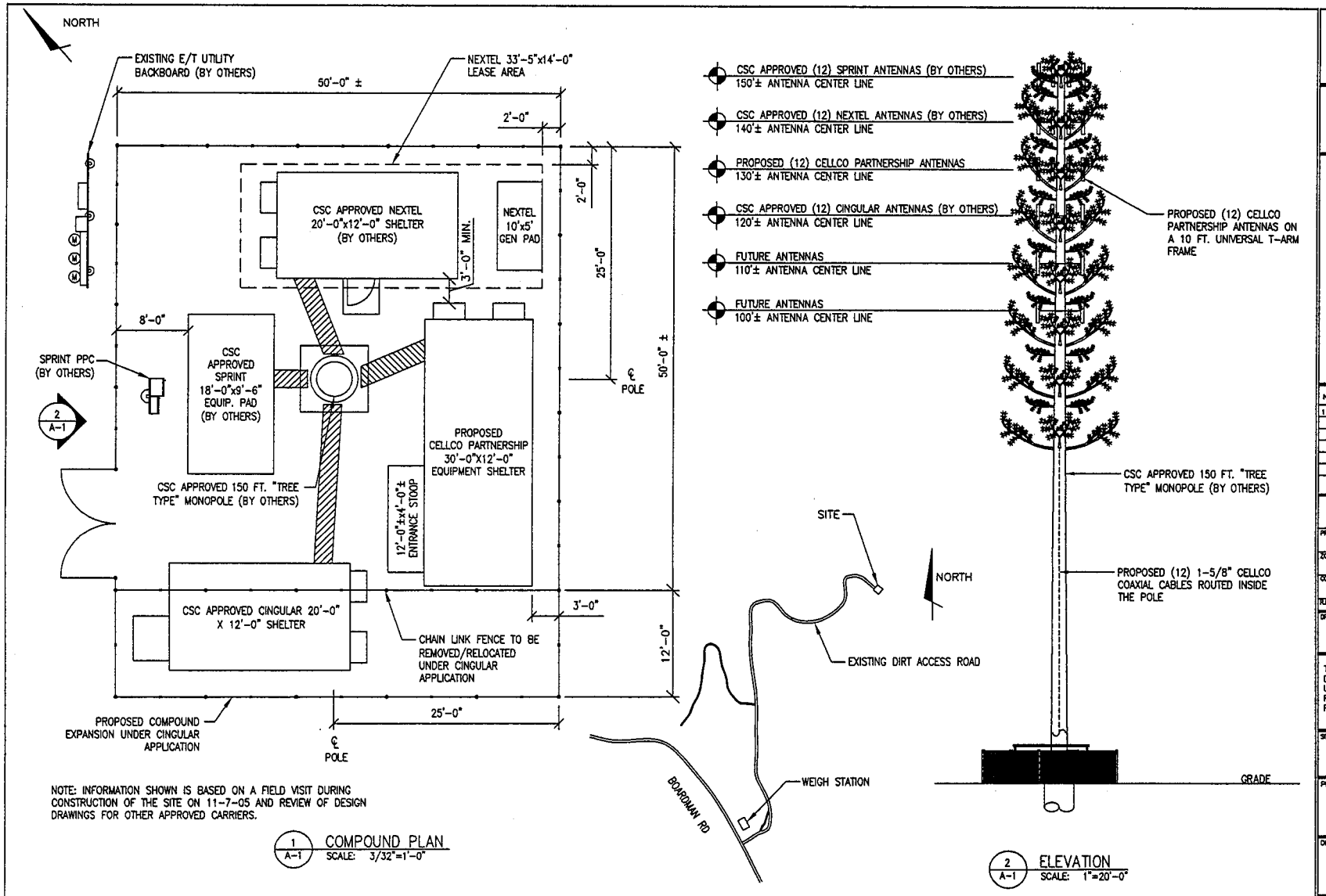
DRAWN BY:	CHECKED BY:
MJ	DW

SITE#
NEW MILFORD WEST

PROJECT INFORMATION:
QUARRY STONE & GRAVEL
33 AKA 86 BOARDMAN RD
NEW MILFORD, CT 06776

DRAWING TITLE:
TITLE SHEET

T-1



CELLCO PARTNERSHIP
d/b/a
verizon wireless
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

On Air Engineering, LLC
88 FOUNDRY POND ROAD
COLD SPRING, NY 10516
(845) 265-3395
(845) 622-4917

LICENSURE

DAVID A. WEINPAHL, P.E.
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NO.:	DATE:	SUBMISSIONS
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APPROVALS:

PROPERTY OWNER	DATE
ZONING	DATE
CONSTRUCTION	DATE
R.F. ENGINEER	DATE

DRAWN BY:	CHECKED BY:
MJ	DW

SITE#
NEW MILFORD WEST

PROJECT INFORMATION:
QUARRY STONE & GRAVEL
33 AKA 86 BOARDMAN RD
NEW MILFORD, CT 06776

DRAWING TITLE:
COMPOUND PLAN & ELEVATION

A-1

On Air Engineering, LLC
88 Foundry Pond Road
Cold Spring, NY 10516
(845) 265-3395 office
(845) 622-4917 fax

December 15, 2005

Mr. Mark Gauger
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

Re: New Milford West, 33 a.k.a. 86 Boardman Road, New Milford, CT 06776
Proposed Verizon Wireless Antenna Co-location on Existing "Tree" Monopole
Structural Analysis

Dear Mark:

Our office has completed a structural assessment and loading conditions for the above referenced "tree" monopole to determine the adequacy of the structure for supporting proposed Verizon Wireless antennas.

Verizon provided our office with Engineering Endeavors Inc. monopole and foundation design drawings dated 2-25-05. The pole was designed as a six (6) carrier, 150 feet "tree" with pine tree branches from approximately 150 feet down to 80 feet and antenna loads and centerlines as follows:

150'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms
140'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms
130'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms
120'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms
110'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms
100'-0"	(12) 5' Panel Antennas on 10 ft. universal T-Arms

Verizon is proposing to install (12) LPA-185090/8CF-2 antennas on a 10 ft. T-Arm frame at 130'-0" centerline. It is our understanding that Sprint has been approved for (12) panel antennas at 150 feet centerline, Nextel with (12) panel antennas at 140 feet centerline and Cingular (12) antennas at 120 feet centerline, all utilizing 10 foot T-Arm frames.

A comparative review of the original design loading against the proposed loading for all carriers noted above shows that the "tree" type monopole is structurally capable of supporting Verizon's proposed antennas. Please feel free to contact our office should you have any questions.

Very truly yours,

STATE OF CONNECTICUT
DAVID A. WEINPAHL
NO. 22144
LICENSED
PROFESSIONAL ENGINEER

David A. Weinpahl, P.E.
Managing Member
On Air Engineering, LLC
CT License No. 22144

DW:dw

General Power Density

Site Name: New Milford West
Tower Height: 150 Ft. VZW @ 130 Ft.

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	1900	3	256	768	130	0.0163	1	1.63%
Sprint	1900	11	122	1342	150	0.0214	1	2.14%
Cingular	880	6	296	1776	120	0.0444	0.5673	7.82%
Cingular	1900	3	427	1281	120	0.0320	1	3.20%
Nextel	851	24	100	2400	140	0.0440	0.5673	7.76%
Total Percentage of Maximum Permissible Exposure								**22.56%**

*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

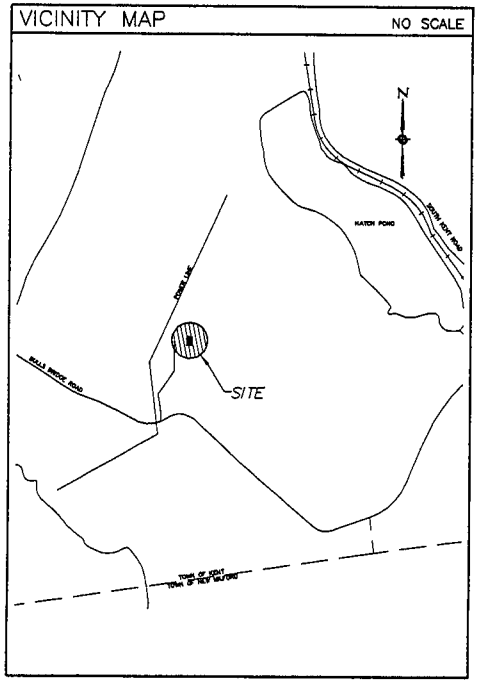
MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

CELLCO PARTNERSHIP
DBA
verizon wireless

KENT

136 BULLS BRIDGE ROAD
KENT, CONNECTICUT

VICINITY MAP — NO SCALE



PROJECT SUMMARY

SITE NAME:	KENT
SITE ADDRESS:	136 BULLS BRIDGE ROAD KENT, CONNECTICUT
CONTACT PERSON:	CELLCO PARTNERSHIP DBA VERIZON WIRELESS MARK GAUGER (860) 803-8240
ZONE:	MAP 6, BLOCK 39, LOT #9
GOVERNING CODE:	CONNECTICUT STATE BUILDING AND LIFE SAFETY CODE
OWNER:	THE SOUTH KENT SCHOOL CORPORATION 40 BULLS BRIDGE ROAD SOUTH KENT, CONNECTICUT 06785
APPLICANT:	CELLCO PARTNERSHIP DBA VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
ARCHITECT:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067
M/E/P ENGINEER:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067
SURVEYOR:	URS CORPORATION A.E.S. 500 ENTERPRISE DRIVE, SUITE 3B 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

verizon wireless

A&E FIRM
URS CORPORATION AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

A&E SEAL

PROJECT NO: 36930902

JOB NO: VZ1-156

DRAWN BY: WRB

CHECKED BY:

ISSUED FOR

A	07-22-05	REVIEW
B	11-03-05	REVIEW
C	12-16-05	REVISED

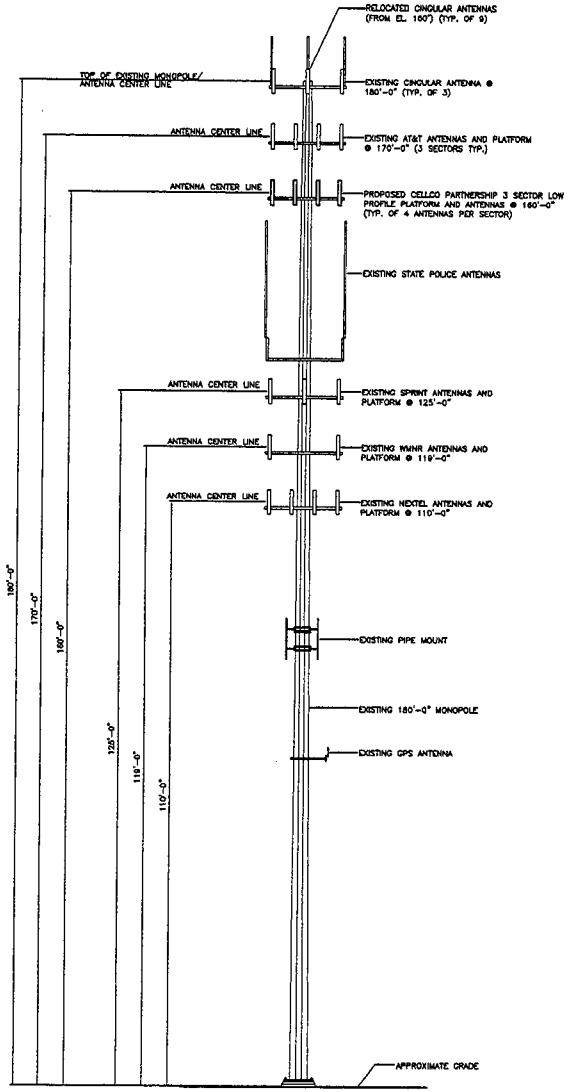
KENT

136 BULLS BRIDGE ROAD
KENT, CONNECTICUT

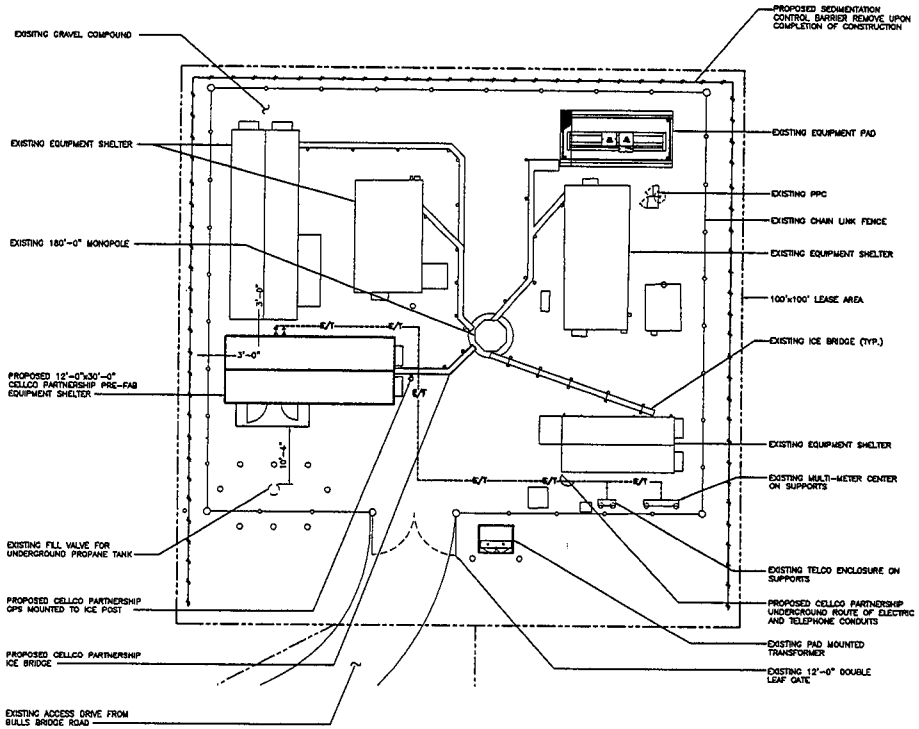
SCALE:

TITLE SHEET-
GENERAL NOTES
AND LEGENDS

T-1

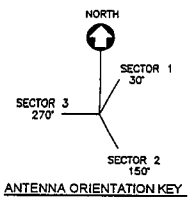


2 / Z-1 TOWER ELEVATION
SCALE: 1" = 10'-0"
0 5 10 20 30



1 / Z-1 COMPOUND PLAN
SCALE: 1" = 10'-0"
0 5 10 20 30

LATITUDE: 41°-40'-53.8" (NAD 27)
LONGITUDE: 73°-29'-13.5" (NAD 27)



ANTENNA ORIENTATION KEY

verizon wireless

A&E FIRM
URS CORPORATION AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

A&E SEAL

PROJECT NO: 36930902
JOB NO: VZ1-158
DRAWN BY: WRB
CHECKED BY:

ISSUED FOR

A	07-22-05	REVIEW
B	11-03-05	REVIEW

KENT

136 BULLS BRIDGE ROAD
KENT, CONNECTICUT

SCALE: AS NOTED

SITE PLAN AND TOWER ELEVATION

Z-1

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 180' MONOPOLE FOR NEW ANTENNA ARRANGEMENT

136 Bulls Bridge Road
Kent, Connecticut

prepared for

verizonwireless

Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by

URS

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

36930908.00000
VZ1-156

September 12, 2005

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 180' steel monopole structure located at 136 Bulls Bridge Rd in Kent, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 80 mph and 69 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 and modifications are listed below:

Relocate (9) CSS DUO1417-8686 antennas and (6) TMA's from 160' to 180' on existing low-profile platform with (9) 1 5/8" coax cables within the monopole	**Cingular (proposed)**	**@ 180' elevation**
Install (12) Antel LPA-185090/8CF antennas on existing low-profile platform with (12) 1 5/8" coax cables within the monopole	**Verizon (proposed)**	**@ 160' 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 Engineered Endeavors Incorporated, signed and stamped December 13, 2000.
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

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

RAS/jri

cc: Alitz Abadjian – URS
CF/Book

2. INTRODUCTION

A structural analysis of the existing 180' steel monopole located at 136 Bulls Bridge Road in Kent, Connecticut was performed by URS Corporation (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 and manufactured by Engineered Endeavors Incorporated. The tower geometry and member sizes taken from original construction drawings and structural calculations prepared by Engineered Endeavors Incorporated, signed and stamped December 13, 2000.

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

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(3) ASP-952	Cingular (existing)	low-profile platform	184.5'	(3) 1 1/4" coax cables (within monopole)
(9) CSS DUO1417-8686 antennas and (6) TMA's	**Cingular (relocated)**	**low-profile platform (listed above)**	**180'**	**(9) 1 5/8" coax cables (within monopole)**
(2) 7262.01 with (4) MHA's	AT&T Wireless (existing)	low-profile platform	171'	(4) 1 5/8" coax cables (within monopole)
(4) Antel LPD7905/4	AT&T Wireless (existing)	low-profile platform (listed above)	171'	(4) 1 5/8" coax cables (within monopole)
(3) 776QNB120EXM	AT&T Wireless (proposed)	low-profile platform (listed above)	171'	(12) 1 5/8" coax cables and (3) 1/2" coax cables (within monopole)
(1) 7262.03	AT&T Wireless (proposed)	low-profile platform (listed above)	171'	(2) 1 5/8" coax cables (within monopole)
(12) Antel LPA-185090/8CF	**Verizon (proposed)**	**low-profile platform**	**160'**	**(12) 1 5/8" coax cables (within monopole)**
(2) Decibel DB809K-XT	CT State Police Dept. (existing)	(2) side arm mounts	143'	(4) 1 5/8" coax cables (within monopole)
(4) Decibel DB980H90T3E-M	Sprint (existing)	low-profile platform	125'	(4) 1 5/8" coax cables (within monopole)
(2) Decibel DB980H90T4E-M	Sprint (existing)	low-profile platform (listed above)	125'	(2) 7/8" coax cables (within monopole)
(2) Decibel DB980H90T3E-M	Sprint (reserved)	low-profile platform (listed above)	125'	(2) 1 5/8" coax cables (within monopole)
(1) Decibel DB980H90T4E-M	Sprint (reserved)	low-profile platform (listed above)	125'	(1) 7/8" coax cable (within monopole)
(1) Standard 2' dish w/ radome	WMNR (existing)	low-profile platform	119'	(1) 7/8" coax cable (within monopole)
(12) Decibel DB846H90E-SX	Nextel (existing)	low-profile platform	110'	(12) 1 1/4" coax cables (within monopole)
(empty)	(existing)	(2) microwave antenna mounts	80'	n/a

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 = 80 mph Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 69 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. The base plate and anchor bolts were found to be within allowable limits. 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.

General Power Density

Site Name: Kent South
Tower Height: 180 Ft. Verizon @ 160 Ft.

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	1900	3	256	768	160	0.0108	1	1.08%
Sprint	1900	11	122	1342	125	0.0309	1	3.09%
Cingular	880	6	296	1776	180	0.0197	0.5673	3.47%
AT&T	1900	3	427	1281	170	0.0159	1	1.59%
Nextel	851	24	100	2400	110	0.0713	0.5673	12.57%
CT - State Police					150	0.0174	0.5773	3.01%
CT - State Police					80	0.3728	1	37.28%
WMNR					119	0.0052	0.2	2.59%
Total Percentage of Maximum Permissible Exposure								**62.10%**

*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