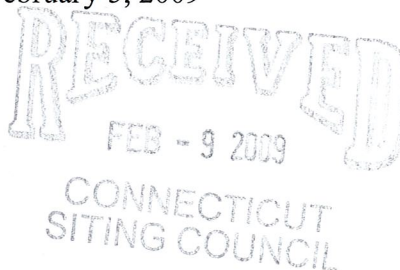


280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

ORIGINAL

February 5, 2009



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

Re: **Cellco Partnership d/b/a Verizon Wireless
Exempt Modification Approval**

Dear Mr. Perrone:

Enclosed you will find a letter from Carlo F. Centore, P.E. with Natcomm Inc., confirming that the Verizon Wireless antenna installation was completed in accordance with the requirements of the Structural Analysis submitted as a part of the referenced exempt modification filing. The attached letter relates specifically to the following Siting Council filing.

1. EM-VER-064-080912
Hartford South 4 – 223 Brainard Road, Hartford, CT

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Kenneth C. Baldwin".

Kenneth C. Baldwin



Law Offices

BOSTON
HARTFORD
NEW LONDON
STAMFORD
WHITE PLAINS
NEW YORK CITY
SARASOTA
www.rc.com

Enclosures

Copy to:

Sandy M. Carter
Brian Ragozzine
Mark Gauger

HART1-1526364-1



February 02, 2009

Mr. Timothy Parks
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

*Re: Structural Certification Letter
Verizon Wireless Site Ref ~ Hartford South 4
223 Brainard Road ~ Hartford, CT*

Natcomm Project No. 09006.00

Dear Mr. Parks,

Natcomm Inc., has been retained by Verizon Wireless to review the structural adequacy of the existing monopole foundation for the proposed installation of (12) panel antennas on a 13-ft low profile platform at the above referenced site.

A previous structural analysis was prepared by GPD Associates (GPD# 2008263.92, dated September 4, 2008 which determined that the tower structure above grade is sufficient for the existing and proposed loading. However, the foundation could not be verified based on the information provided.

Comprehensive research conducted by Natcomm Inc., has established that the existing foundation construction consists of a 45-ft long x 7.0-ft \varnothing reinforced drilled concrete caisson. Subsurface information was taken from a supplemental geotechnical investigation report prepared by Tectonic Engineering Consultants, P.C., dated March 16, 2000 and was compared against the findings of a subsequent summary of construction inspection letter also prepared by Tectonic Engineering Consultants, P.C., dated June 12, 2000.

The aforementioned supplemental information is available for reference in the Appendix of this review.

Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna configuration.

Existing antenna/appurtenance configuration:

- **AT&T: (Existing)**
Antennas: Six (6) Powerwave 7770.00 panel antennas, six (6) Powerwave LPG21401 TMA's on a 13-ft platform with a RAD center elevation of 98-ft AGL.
Coax Cables: Twelve (12) 1-1/4" \varnothing coax cables (interior).

Proposed antenna/appurtenance configuration:

- **VERIZON WIRELESS (Proposed):**
Antennas: Six (6) Antel LPA 80063/4CF_5 and six (6) Antel LPA 185063/8CF_2 panel antennas on one (1) 13-ft Low Profile Platform with a RAD center elevation of 88-ft above the existing tower base plate.
Coax Cable: Twelve (12) 1-5/8" \varnothing coax cables (interior).

p: 203.488.0580
f: 203.488.8587
w: nat-eng.com
63-2 N. Branford Rd.
Branford, CT 06405

Re: Structural Certification Letter
Verizon Wireless Site Ref ~ Hartford South 4
223 Brainard Road ~ Hartford, CT

Page 2 of 2

Foundation

Review of the foundation design consisted of verification of applied loads obtained from the GPD Associates tower design calculations and code checks of allowable stresses:

- The tower base reactions developed from the governing Load Case 1 of the aforementioned design calculations were used in the verification of the caisson foundation and are listed below:

Base Reactions	Vector	Proposed Load (kips/ft-kips)
Base	Shear	10
	Axial	15
	Moment	749

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	15.0%	PASS
	Lateral Deflection	0.24 in. ⁽¹⁾	PASS

(1) Lateral deflection limited to 0.5 in. for monopole tower structures.

Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon Wireless. If the existing conditions are different than the information in this report, Natcomm, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer





at&t

Glynn Walker
AT&T Mobility
5405 Windward Pkwy
Alpharetta GA, 30004
(770) 708-6122



GPD ASSOCIATES

Kevin Clements
520 South Main St., Suite 2531
Akron, Ohio 44311
(330) 572-2195
kclements@gpdgroup.com

GPD# 2008263.92
September 4, 2008

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION: Site USID: 4539
Site FA: 10071011
Site Name: EAST HARTFORD HOCHANUM

VERIZON DESIGNATION: Site Name: Hartford South-4
Site Number: Hartford South-4

ANALYSIS CRITERIA: Codes: TIA/EIA-222-F & 2003 IBC
80-mph with 0" ice
69-mph with 1/2" ice

SITE DATA: 223 Brainard Road, Hartford, CT 06114, Hartford County
Latitude 41° 43' 58.0" N, Longitude 72° 39' 42.8" W
98' Monopole

Mr. Walker,

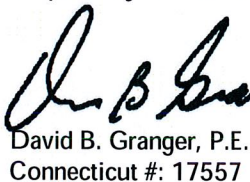
GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the addition of the following proposed loading configuration:

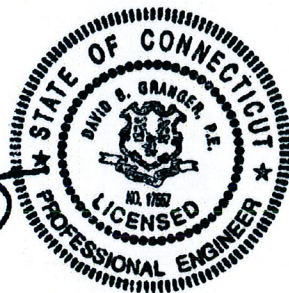
Elev. 88' (6) Antel LPA-80063/4CF_5 Antennas on a 13' PiROD LP Platform, w/ (6) 1-5/8" internal coax
(6) Antel LPA-185063/8CF_2 Antennas on the same Platform, w/ (6) 1-5/8" internal coax

Based on our analysis we have determined the tower is sufficient for the proposed, existing, and reserved loadings as referenced in Appendix A. However, the foundation could not be verified based on the information provided.

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T. If you have any questions please do not hesitate to call.

Respectfully submitted,


David B. Granger, P.E.
Connecticut #: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify that the existing structure is capable of carrying the proposed loading configuration as specified by Verizon Wireless to AT&T. This report was commissioned by Mr. Glynn Walker of AT&T.

No foundation or geotechnical information was available or provided for this report. Therefore, the in place capacity of the existing foundation could not be verified. A geotechnical investigation and foundation exploration are recommended to verify the capacity of the foundation with the proposed loading.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	62.0%	Pass
Base Plate	43.6%	Pass
Anchor Rods	50.4%	Pass
Foundation	Not Verified	N/A

ANALYSIS METHOD

RISA Tower (Version 5.2.0.1), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information.

DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Wireless Co-location document	G. Walker
Tower Mapping	GPD Associates and STG Communications, dated 8/15/08	GPD
Co-Location Application	Verizon Wireless Application, dated 4/15/08	G. Walker

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the monopole. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified. In the case of absent foundation data, it is the tower owner's responsibility to insure that the foundation system is adequate to support the structure with its new reactions.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications, if any, are assumed to be as per data supplied/available, to have been properly installed and to be fully effective.
9. Tower Mounted Amplifiers are assumed to be installed behind antennas.
10. All existing loading was obtained from the provided Preliminary Tower Summary, site photos and the Tower Mapping performed by GPD Associates and STG Communications on 8/15/08 and is assumed to be accurate.
11. All proposed coax is assumed to be internal to the monopole.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Associates should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD ASSOCIATES has performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD ASSOCIATES in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD ASSOCIATES does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD ASSOCIATES provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD ASSOCIATES, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD ASSOCIATES makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD ASSOCIATES will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD ASSOCIATES pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	EAST HARTFORD HOCHANUM
Site Number	4539
Site F.A.	10071011
Date of Analysis	9/4/2008
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info

Description	Date
Tower Type (G, SST, MP)	MP
Tower Height (top of steel (AGL))	98
Tower Manufacturer	n/a
Tower Model	n/a
Manufacturer Design	n/a
Foundation Design	n/a
Geotech Report	n/a
Tower Mapping	GPD and STG Communications 8/15/2008
Foundation Mapping	n/a
Previous Structural	n/a

Design Parameters

Design Code Used	TIA/EIA-222-F
Location of Tower (County, State)	Hartford, Connecticut
Basic Wind Speed (mph)	80-fastest
Ice Thickness (in)	0.5"
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)

Existing Condition	
Tower	42.2%
Foundation	n/a
Guy Wire	n/a

Note: Foundation not Verified

Proposed Condition	
Tower	62.0%
Foundation	n/a
Guy Wire	n/a

Note: Foundation not Verified

Steel Yield Strength (ksi)

Pole	50
Base Plate	50
Anchor Rods	75

Note: Yield Strengths Assumed

Existing/Reserved

Antenna			Mount			Transmission Line					
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft²) each	Azimuth	Quantity	Type	Model	EPA (ft²) total	Attachment Leg/Face
AT&T Mobility	98	6	Panel	7770.00	5.88		12	1'13" Platform		24.80	1-1/4" Internal
AT&T Mobility	98	6	TWA	LSP:21401	shielded			on same mount			Internal

Proposed

Antenna			Mount			Transmission Line					
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft²) each	Azimuth	Quantity	Type	Model	EPA (ft²) total	Attachment Leg/Face
Verizon Wireless	88	6	Panel	LPA-80063/4CF_5	7.01		6	1'13" Platform	PIROD	15.70	1-5/8" Internal
Verizon Wireless	88	6	Panel	LPA-185063/8CF_2	2.97		6	on same mount			1-5/8" Internal

Future

Antenna			Mount			Transmission Line					
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft²) each	Azimuth	Quantity	Type	Model	EPA (ft²) total	Attachment Leg/Face
AT&T Mobility	98	3	Panel	7770.00	5.88	0,120,240		on same mount			

Note: Future loading is in addition to the existing loading at the same elevation.

Revision:1.2

Date: 12/15/06

APPENDIX B

RISA Tower Output File

RISATower GPD Group 520 South Main Street, Suite 2531 Akron, OH 44311 Phone: 330.572.2100 FAX: 330.572.2103	Job 4539 EAST HARTFORD HOCHANUM	Page 1 of 2
	Project 2008263.92	Date 10:18:14 09/04/08
	Client AT&T MOBILITY	Designed by M. Moellendick

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 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _i		Weight	
						No Ice	1/2" Ice		ft ² /ft
LDF6-50A (1-1/4 FOAM) (ATT)	A	No	Inside Pole	98.00 - 8.00	12	No Ice	1/2" Ice	0.00	0.00
LDF7-50A (1-5/8 FOAM) (VERIZON)	B	No	Inside Pole	88.00 - 8.00	12	No Ice	1/2" Ice	0.00	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _i		Weight K
			Horz Lateral ft	Vert ft			Front ft ²	Side ft ²	
Valmont 13' Platform w/o rails (GPD) (ATT)	A	None			0.0000	98.00	No Ice	1/2" Ice	1.50
(3) 7770.00 (ATT)	A	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice	1/2" Ice	2.50
(3) 7770.00 (ATT)	B	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice	1/2" Ice	0.04
(3) 7770.00 (ATT)	C	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice	1/2" Ice	0.07

RISATower

GPD Group
 520 South Main Street, Suite 2531
 Akron, OH 44311
 Phone: 330.572.2100
 FAX: 330.572.2103

Job	4539 EAST HARTFORD HOCHANUM	Page	2 of 2
Project	2008263.92	Date	10:18:14 09/04/08
Client	AT&T MOBILITY	Designed by	M. Moellendick

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
(2) LGP21401 (ATT)	A	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(2) LGP21401 (ATT)	B	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(2) LGP21401 (ATT)	C	From Centroid-Face	4.00	0.00	0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
PiROD 13' Low Profile Platform (VERIZON)	A	None			0.0000	90.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(2) LPA-80063/4CF (VERIZON)	A	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-80063/4CF (VERIZON)	B	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-80063/4CF (VERIZON)	C	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-185063/8CFx2 (VERIZON)	A	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03
(2) LPA-185063/8CFx2 (VERIZON)	B	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03
(2) LPA-185063/8CFx2 (VERIZON)	C	From Centroid-Face	4.00	0.00	0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03

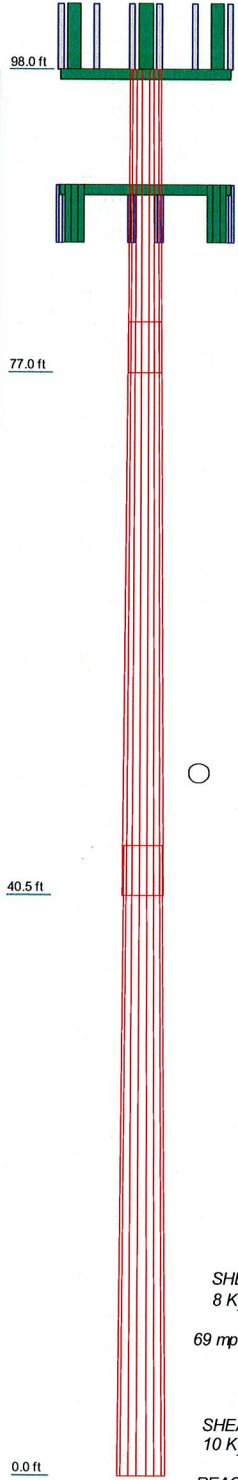
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	98 - 77	Pole	TP28.371x25.44x0.1875	1	-4.36	659.12	21.3	Pass	
L2	77 - 40.5	Pole	TP33.466x27.5075x0.25	2	-8.18	1037.47	49.6	Pass	
L3	40.5 - 0	Pole	TP39.12x32.4446x0.3125	3	-14.56	1539.31	62.0	Pass	
							Summary		
							Pole (L3)	62.0	Pass
							RATING =	62.0	Pass

APPENDIX C

Tower Elevation Drawing

Section	1	2	3
Length (ft)	21.00	40.00	44.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.2500	0.3125
Lap Splice (ft)		3.50	3.50
Top Dia (in)	25.4400	27.5075	32.4446
Bot Dia (in)	28.3710	33.4660	39.1200
Grade		A572-50	
Weight (K)	1.1	3.3	5.3



DESIGNED APPURTENANCE LOADING

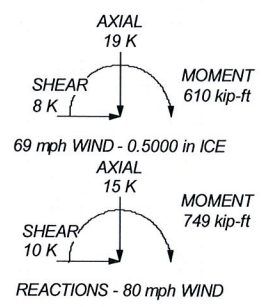
TYPE	ELEVATION	TYPE	ELEVATION
Valmont 13' Platform w/o rails (GPD) (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-185063/8CFX2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFX2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFX2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFX2 (VERIZON)	90
PI/ROD 13' Low Profile Platform (VERIZON)	90		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 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 60 mph wind.
5. TOWER RATING: 62%



 GPD Group Consulting Engineers	520 South Main Street, Suite 2531	Job: 4539 EAST HARTFORD HOCHANUM
	Akron, OH 44311	Project: 2008263.92
	Phone: 330.572.2100	Client: AT&T MOBILITY Drawn by: M. Moellendick App'd:
	FAX: 330.572.2103	Code: TIA/EIA-222-F Date: 09/04/08 Scale: NTS
		Path: G:\Telecom\2008263\92\risa\4539EHartford.er Dwg No: E-1

APPENDIX D

Anchor Rod & Base Plate Analysis

Anchor Rod and Base Plate Stresses
4539 EAST HARTFORD HOCHANUM

Overturning Moment =	749.00	k*ft
Axial Force =	15.00	k
Shear Force =	10.00	k

Anchor Rods		
Pole Diameter =	39.12	in
Number of Rods =	8	
Rod Grade (Fy) =	75	ksi
Rod Circle =	44.878	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
0 Degrees		
Max Tension on Rod =	68.93	kips
Max Compression on Rod =	72.68	kips
45 Degrees		
Max Tension on Rod =	98.26	kips
Max Compression on Rod =	102.01	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	50.4%	OK

Base Plate		
Plate Strength (Fy) =	50	ksi
Plate Thickness =	2.75	in
Plate Width =	44	in
Est. Dist. b/w Rods =	6	in
W _{calc} =	13.02	in
e =	1.7542	in
W _{max} =	23.105	in
w =	13.02	in
S =	16.41	in ³
fb =	21.81	ksi
Fb =	50	ksi
Base Plate Capacity =	43.6%	OK

CT 126

TECTONIC ENGINEERING
CONSULTANTS P.C.

P.O. Box 37, 70 Pleasant Hill Road
Mountainville, New York 10953

OFFICES:
Osney, N.Y.
Catskill, N.Y.
Mt. Vernon, N.Y.

Cincinnati, OH
Northborough, MA
Richmond, VA

(800) 820-6531 FAX: (914) 534-5959
www.tectonicengineering.com

AT&T Wireless PCS LLC
149 Water Street
Norwalk, Connecticut 06854

Attention: Mr. Bill Appleton

March 16, 2000

**RE: W.O. 2323.126
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
PROPOSED 120-FOOT MONOPOLE AND EQUIPMENT SHELTER
RELOCATED LEASE AREA
EAST HARTFORD (CT-126) - SOBOL ENTERPRISES
223 BRAINARD ROAD
HARTFORD, CONNECTICUT**

Dear Mr. Appleton:

We have performed a supplemental geotechnical investigation at the above referenced site for the proposed monopole and equipment shelter installations. The supplemental investigation was conducted to determine if the design parameters and construction recommendations made in our January 28, 2000 geotechnical report for construction at the originally proposed monopole location is applicable to the new monopole location. The revised monopole location is approximately 200 feet from the originally proposed location.

Results of the investigation indicate that the soils at the relocated monopole position generally have a looser consistency, especially at greater depths. Therefore the recommendations made in our original report are not valid and should not be used for design.

Revised foundation design and construction recommendations are presented herein. These will be preceded by a discussion of the design considerations, a description of the site conditions and a description of the present subsurface investigation and encountered subsurface conditions.

1.0 DESIGN CONSIDERATIONS

The proposed structures include a 120-foot high monopole for mounting of communication antennas and an equipment shelter. For the proposed monopole structure, it is expected that the overturning loads will be large, whereas the vertical and horizontal loads will be modest in comparison. The proposed unmanned equipment shelter will have a footprint area of approximately 12-foot by 20-foot. The equipment shelter foundations are expected to be subjected to relatively light loads. The actual loads from the monopole structure and the unmanned equipment shelter are to be determined by others. We assume that the site will not be re-graded by more than 1 or 2 feet relative to existing grade.

2.0 SITE DESCRIPTION

The project site is located at 223 Brainard Road in Hartford, Connecticut, which is just east of the intersection of Route 5 and Interstate Highway 91. The revised lease area is situated about 140 feet west of an existing movie theater building and about 250 feet east of Interstate Highway 91. The area is generally level and vegetated with grass and weeds. There are sporadic mounds of debris in the area. They were observed to contain leaves, tires and other materials. The ground surface descends south of the site and wetland type vegetation was observed in the lower area. There is also a small brook or ditch about 60 feet west of the proposed lease area.

3.0 FIELD INVESTIGATION

The supplemental field investigation consisted of one test boring, designated as boring B-3, which was drilled at the revised monopole location. These borings supplemented the two borings which were performed during the initial site investigation identified as borings B-1 and B-2. The location of the test borings as well as the locations of the originally proposed and revised monopole locations are shown on the attached Boring Location Plan, Figure 1.

The supplemental boring was drilled by Geotechnical Drilling, Inc. on March 13, 2000. The boring was advanced to a depth of 49 feet utilizing 3 1/4 inch diameter hollow-stem augers. Standard Penetration Testing (SPT) and split-spoon sampling were performed continuously to a depth of 12 feet and at 5-foot intervals thereafter. The groundwater level was measured after the completion of the boring. An engineering geologist observed the boring operations on a full time basis. A log of the present boring as well as the logs of the initially conducted borings are attached.

4.0 SUBSURFACE CONDITIONS

The general subsurface stratigraphy encountered at the revised monopole location is similar to that encountered at borings B-1 and B-2 except that the soil consistency was generally softer. At boring B-3, the subsurface conditions consist of an approximately 2-foot thick layer of fill overlying an approximately 28 feet thick layer of loose to very loose silty sands overlying an approximately 17 feet thick layer of very soft silty clay overlying very dense glacial till.

The fill, which consists of brown to gray medium to fine sand with some silt, little fine gravel and trace metal debris had a Standard Penetration Test (SPT) blow count of 10 blows per foot (bpf). This indicates that the fill is in a medium dense condition.

The underlying sands are generally fine to medium to fine in gradation and are tan in color. The sands contain from approximately 10 to 40 percent silt with the silt content decreasing with depth. The sands occasionally contain trace amounts of gravel and are micaceous. SPT blow counts in the sands ranged between 2 and 4 bpf to a depth of 12 feet indicating the sands are in a very loose condition within this depth interval. From a depth of 15 feet to 27 feet, the SPT blow counts ranged between 6 and 8 bpf indicating the sands are in a generally loose condition within this interval.

The underlying silty clay is typically red-gray to red in color and typically contains minor amounts of sand. SPT blow counts in the silty clay ranged from 1 bpf to the weight of the hammer assembly (the sampler penetrates 1-foot under the weight of the hammer alone). These indicate very soft consistencies within the silty clay.

Glacial till underlies the clay at an approximate depth of 47 feet. The till is comprised of red coarse to fine sand with some clayey silt and some fine gravel. An SPT blow count of 72 bpf in the till indicate it is in a very dense condition.

Groundwater was measured at a depth of approximately 2 feet at boring B-3. This corresponds to an approximate groundwater elevation of 408 feet. However, it should be noted that the groundwater level will fluctuate seasonally and with changes in weather conditions.

5.0 MONOPOLE FOUNDATION RECOMMENDATIONS

Based on the results of the supplemental subsurface investigation, it is our opinion that construction of the foundations for the proposed monopole structure and the proposed equipment shelter is feasible relative to geotechnical considerations, provided the revised

recommendations presented in this report are incorporated into the design and construction.

5.1 Design Criteria

We recommend the monopole be supported on a drilled shaft foundation. Parameters for a mat foundation can also be provided if this alternative is desired. The drilled shaft foundation should have a minimum embedment depth of 15 feet, or at least 3 times the designed shaft diameter, whichever is deeper. The actual depth of embedment and diameter of the drilled shaft should be determined by the design engineer based on the actual loads and the geotechnical design criteria presented in this report.

For the purpose of design, the groundwater table should be taken as being at the existing ground surface. The geotechnical engineering parameters provided below are based on these groundwater conditions.

The following allowable net bearing pressures and allowable side resistance values should be used to design the drilled shaft to resist the vertical compressive loads:

Depth (feet)	Allowable Net End Bearing Pressure, q_b (Pounds per Sq. Ft.)	Allowable Side Resistance ⁽¹⁾ (Pounds per Sq. Ft.)
0 to 5	NA	NA
5 to 15	NA	120 to 250
15 to 25	2800	250 to 360
25 to 30	500	360 to 400
30 to 47	500	45
47 to 49	12,000	550

(1) The values are estimated based on casting concrete directly against the sidewall of the excavation on the same day that the excavation is started. Use zero side friction at the top 5 feet.

The following soil parameters are provided for designing to resist lateral movement and tilting and for analyzing lateral deflection and lateral stability. Lateral deflection at the top of the drilled shaft should be checked using a computer program such as LPILE. Maximum deflection should not exceed that recommended by the monopole manufacturer.

Depth (feet)	γ (pcf)	ϕ (degrees)	C_u (psf)	K_1 (pci)	K_p	ϵ_{50} (inch/inch)
0 to 5	50	NA	NA	NA	NA	NA
5 to 15	50	28	NA	20	2.77	NA
15 to 30	50	30	NA	20	3.0	NA
30 to 47	45	0	200	30	NA	0.02
47 to 49	60	36	NA	125	3.85	NA

where,

γ = design unit weight of soil (pounds per cubic foot).

ϕ = angle of internal friction (degrees).

C_u = undrained shear strength (pounds per square foot).

K_1 = coefficient of lateral subgrade reaction (pounds per cubic inch) required for p-y curve methods of analysis.

K_p = coefficient of passive pressure.

ϵ_{50} = axial strain of soil corresponding to one-half of the maximum principal stress difference.

5.2 Construction Criteria

The drilled shafts should be constructed under the full-time observation of the geotechnical engineer and in accordance with the most recent standards of the ASDC and ACI 336. The geotechnical engineer should observe the drilling to confirm that the subsurface conditions are consistent with those found at the boring location. The bearing stratum should be explored with a probe hole below the bottom of the drilled shaft, at the discretion of the geotechnical engineer, in order to verify the bearing capacity of the underlying stratum. If test results indicate that the stratum is not capable of providing the required bearing pressure, adjustments to the drilled shaft depth should be made as directed by the geotechnical engineer.

The use of slurry or temporary casing or possibly both for the full depth of the shaft could be necessary to maintain stability of the sides and bottom of the hole. Prior to placement of concrete, the bottom of the shaft should be cleared of loose material. Free water in quantities sufficient to cause settlement or affect concrete strength should be removed from the excavation in a manner that will not loosen the subgrade. If the drilled shaft cannot be dewatered, or if dewatering would result in disturbance of the

foundation subgrade or the sidewalls of the excavation, then the concrete should be placed using tremie methods. Tremie concrete methods are also required if slurry is used. If casing is used, concrete placement should be done in a manner to prevent "necking" of the caisson.

6.0 UNMANNED EQUIPMENT SHELTER FOUNDATION RECOMMENDATIONS

The unmanned equipment shelter is proposed on the east side of the lease area. Based on our review of the project plans, it is our understanding that the equipment platform will be a one-story structure with exterior dimensions of approximately 12 feet by 20 feet and will be supported on conventional spread footings. We recommend that the footings be founded on the natural sand soils. The bottom of the footings should be no less than 3.5 feet below finished grade to protect against frost penetration. An allowable bearing pressure of 750 psf should be used to determine the dimensions of the footings. The widths of the spread footings should be at least 2.5 feet for isolated footings and no less than 1.5 feet for continuous footings.

All footing subgrades should be inspected by the geotechnical engineer. If unsuitable materials such as organic materials, soft, wet soil or debris are encountered, they should be removed from the zone of influence of the footings. The zone of influence for removal of unsuitable materials is defined by the imaginary lines sloping at one vertical (1V) to one horizontal (1H) from the bottom edges of the footings. Material removed from the zone of influence of footings should be replaced with compacted structural fill placed in 8 inch thick loose lifts and compacted to at least 95 percent of the maximum density as determined in the laboratory in accordance with ASTM D1557. In confined areas, where compaction is limited to the use of hand operated equipment, the structural fill should be placed in 4-inch thick loose lifts. Structural fill should be a clean well-graded granular soil having no more than 15 percent by weight passing the No. 200 sieve. The material should also be free of organic matter and debris and have a moisture content suitable for compaction.

Groundwater will likely be encountered during excavation. Dewatering should be performed in a manner that will not disturb or loosen the subgrade soils. Sumping should not be conducted in subgrade areas. If possible, rainfall runoff should be intercepted outside of the excavation area. Subgrade material softened by water or exposure should be removed and replaced with compacted structural fill.

Mr. Appleton/CT-126

Page 7

March 16, 2000

7.0 LIMITATIONS

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

This report has been prepared for the exclusive use of AT&T Wireless PCS LLC for the specific application to the "East Hartford (CT-126)" site located at 223 Brainard Road in Hartford, Connecticut.

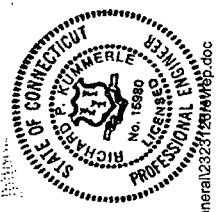
In the event that any changes in the design or location of the proposed monopole and unmanned equipment shelter structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless reviewed and verified in writing by Tectonic Engineering Consultants P.C. It is recommended that Tectonic Engineering be retained to provide construction monitoring and inspection services to ensure proper implementation of the recommendations contained herein, which would otherwise limit our professional liability.

We trust this report will allow you to proceed with design of the proposed foundations.

Sincerely,

TECTONIC ENGINEERING CONSULTANTS, PC

Richard P. Kummerle, P.E.
Managing Principal



RPK/GPM File g:\geo\general\23231\2316\mhp.doc

Attachments: Figure 1, Boring Location Plan
Boring Logs, B-1, B-2 and B-3
Legend Sheet for Soil Descriptions

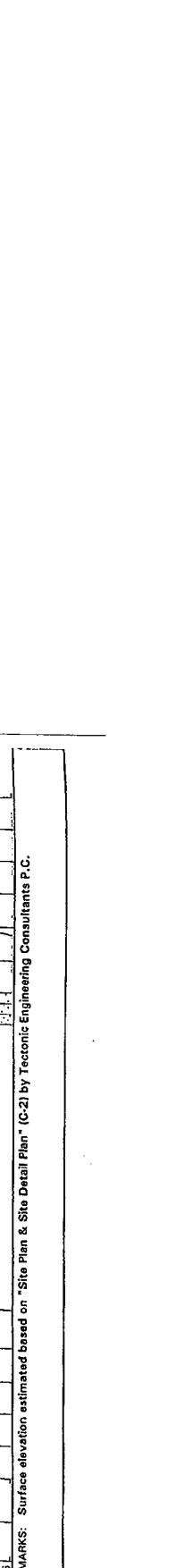
Cc: Jeff Kirby, P.E. - Tectonic

BORING No. B-1

PROJECT No. 2323.126
 PROJECT: East Hartford (CT-126)
 LOCATION: Hartford, CT
 SHEET No. 1 of 2

CLIENT: AT&T Wireless PCS, LLC
 CONTRACTOR: General Borings, Inc.
 METHOD OF ADVANC. BORING: D/A. DEPTH: 7'
 POWER AUGER: 4 1/4" 0 TO 50' MON. WELL YES NO DATUM: See Remarks
 RGT. DRILL: TO TO SCREEN DEPTH: TO TO DATE: 1/24/00 INSPECTOR: Barry Oulmet
 CASING: TO TO WEATHER: Overcast TEMP: 30 F DATE FINISH: 1/24/00 DRILLER: Ed Pelkey
 DIAMOND CORE: TO TO DEPTH TO ROCK: NE SURFACE ELEVATION: 9'
 UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²): *CHANGES IN STRATA ARE INFERRED

DEPTH (FT.)	N OR MIN./FT.	PENETR. RESIST. (BLF IN.)	SAMPLE NUMBER (BLF IN.)	SAMPLES		UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY	ELEVATION (FT.)
				RECOV. ROD (%)	MOISTURE				
1-54		45	S-1	4	M	SM	Frozen ground to 1.5'		
2		32					Rd bwn c-f SAND, some f Gravel, some Silt		
3-7		22	S-2	7	M	SM	Rd to Tn c-f SAND, some Silt, little f Gravel		
4		10					(No recovery)		
6-11		5	S-3	0	W		Tn m-f SAND, little Silt (micaceous)		
7-12		3					Tn m-f SAND, little Silt (micaceous)		
8		4	S-4	18	W	SM	Tn m-f SAND, little Silt (micaceous)		
9-17		9					Tn m-f SAND, little Silt (micaceous)		
10		6	S-5	16	W	SM	Tn m-f SAND, little Silt (micaceous)		
11-6		10					Tn m-f SAND, little Silt (micaceous)		
12		7	S-6	18	W	SM	Tn c-f SAND, little Silt		
13		7							
15		7							
16-18		8	S-7	16	W	SM			
17		10							
18		12							
19									
20									
21-24		5	S-8	19	W	SM	Gy c-f SAND, little Silt, trace f Gravel (micaceous)		
22		8							
23		16							
24		19							
25									



REMARKS: Surface elevation estimated based on "Site Plan & Site Detail Plan" (C-2) by Tectonic Engineering Consultants P.C.

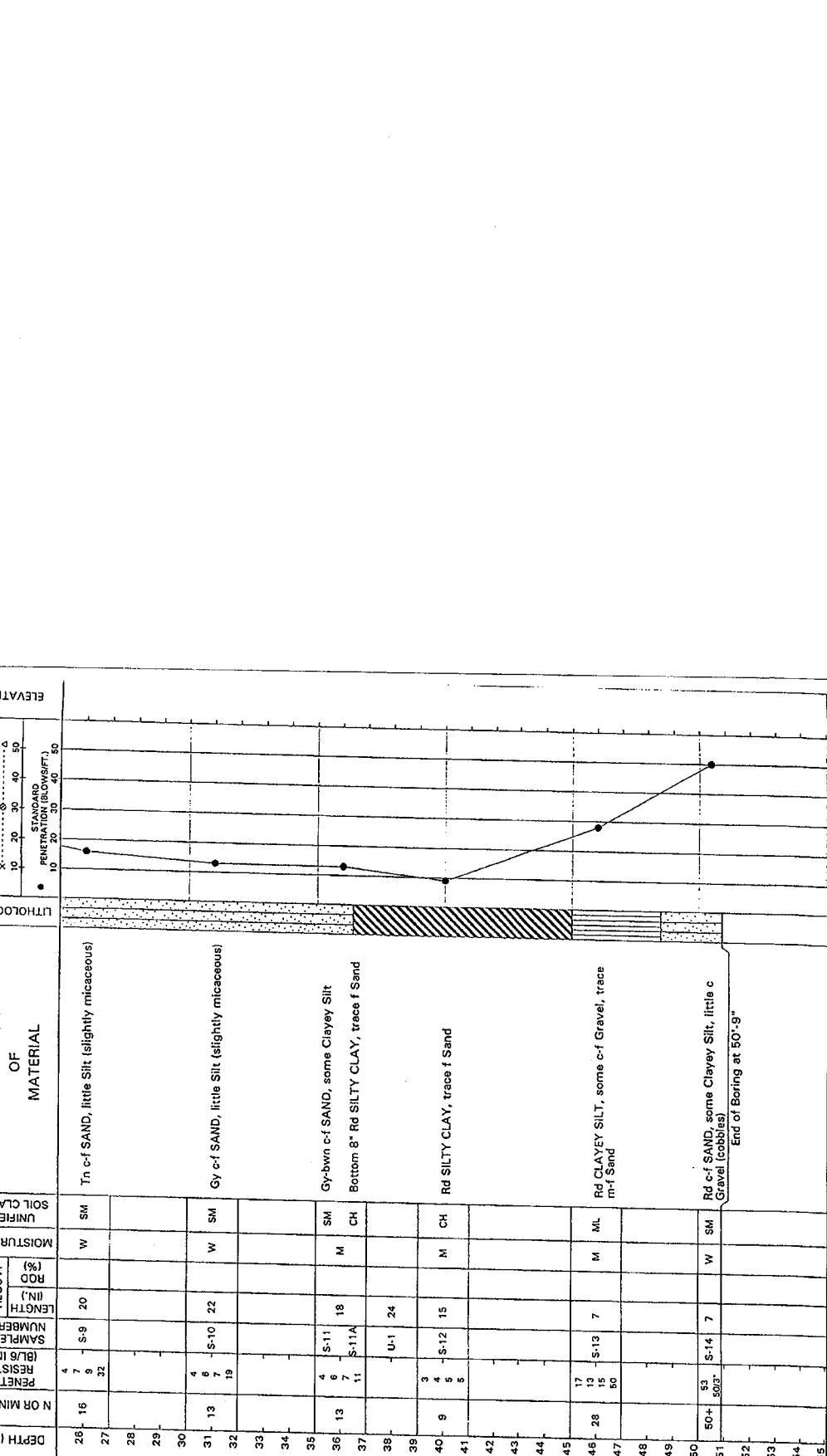
TECTONIC ENGINEERING CONSULTANTS P.C.

BORING No. B-1

PROJECT No. 2323.126
 PROJECT: East Hartford (CT-126)
 LOCATION: Hartford, CT

CLIENT: AT&T Wireless PCS, LLC
 CONTRACTOR: General Borings, Inc.

SHEET No. 2 of 2



REMARKS: Surface elevation estimated based on "Site Plan & Site Detail Plan" (C-2) by Tectonic Engineering Consultants P.C.

End of Boring at 50'-9"

TECTONIC ENGINEERING CONSULTANTS P.C.

BORING No. B-2

PROJECT No. 2323.126
 PROJECT: East Hartford (CT-126)
 LOCATION: Hartford, CT

SHEET No. 1 of 1

CLIENT: AT&T Wireless PCS, LLC
 CONTRACTOR: General Borings, Inc.
 METHOD OF ADVANC. BORING: DIA. DEPTH
 POWER AUGER: 4 1/4" 0 TO 4'
 ROT. DRILL: MON. WELL YES NO
 CASING: TO TO
 DIAMOND CORE: TO TO

DATE: 1/24/00
 TIME: 3:40 pm
 INSPECTOR: Barry Oulmet
 DRILLER: Ed Pelkey
 SURFACE ELEVATION: 9'
 DATUM: See Remarks
 DATE START: 1/24/00
 DATE FINISH: 1/24/00

TEMP: 30 F
 WEATHER: Clear
 DEPTH TO ROCK: NE

UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)

DEPTH (FT.)	N OR MIN./FT.	PENETR. RESIST. (BL/IN.)	SAMPLE NUMBER	LENGTH (IN.)	RECOV. (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY	PLASTIC LIMIT %		LIQUID LIMIT %		STANDARD PENETRATION (BLOWS/FT.)
										X	Y	Δ	Δ	
1	18	10	S-1	14	M	SM	Top 6" possible FILL, organics, gravel Gy bwn f SAND, some Silt			10	20	30	40	50
2		8												
3	13	7	S-2	18	W	SM	Gy bwn f SAND, little Silt							
4		5												
5	8	4	S-3	16	W	SM	Gy bwn m-f SAND, little Silt (micaceous)							
6		5												
7	11	6	S-4	18	W	SM	Bwn m-f SAND, little Silt (micaceous)							
8		4												
9	15	6	S-5	18	W	SM	Same							
10		9												
11	11	5	S-6	20	W	SM	Same							
12		7												
13								End of Boring at 12.0' (Water level at 12.5' with augers. After augers pulled, hole caved)						
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														

REMARKS: Surface elevation estimated based on "Site Plan & Site Detail Plan" (C-2) by Tectonic Engineering Consultants P.C.

TECTONIC ENGINEERING CONSULTANTS P.C.

BORING No. B-3

PROJECT No. 2323.126
 PROJECT: East Hartford (CT-128)
 LOCATION: Hartford, CT

CLIENT: AT&T Wireless PCS, LLC
 CONTRACTOR: Geotechnical Drilling, Inc.
 METHOD OF ADVANC. BORING: 3 1/4" DIA.
 POWER AUGER: 3 1/4" 0 TO 45' MON. WELL YES NO
 ROT. DRILL: TO TO
 CASING: TO TO
 DIAMOND CORE: TO TO

INSPECTOR: Barry Oulmet
 DRILLER: Richie Comfort
 SURFACE ELEVATION: 10.0
 DATUM: Sea Remarks
 DATE START: 3/13/00
 DATE FINISH: 3/13/00
 UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²):

DEPTH (FT.)	N OR MIN./FT.	PENETR. RESIST. (BL/6 IN.)	SAMPLES			SOIL CLASS.	UNIFIED	MOISTURE	DESCRIPTION OF MATERIAL	LITHOLOGY	ELEVATION (FT.)
			RECOV. (%)	LENGTH (IN.)	ROD (IN.)						
1	10	3									
2	6	4	S-1	10		SM	M	Bvn to gy m-f SAND, some Silt, little f Gravel with wire fragment (FILL)			
3	6	3	S-2	16		SM	M	Tn f SAND and Silt (micaceous)			
4	2	1	S-3	9		SM	W	Bottom 6" wet			
5	4	2	S-4	12		SM	W	Same			
6	3	1	S-5	18		SM	W	Tn f SAND, some Silt (micaceous)			
7	3	2	S-6	13		SM	W	Same, little Silt			
8	3	1						Gy tn m-f SAND, little Silt (micaceous)			
9	6	3	S-7	12		SM	W	Tn m-f SAND, little Silt			
10	2	3									
11	2	1									
12	2	2									
13											
14											
15											
16	8	4	S-8	15		SM	W	Same			
17	4	4									
18											
19											
20											
21											
22											
23											
24											
25											

* CHANGES IN STRATA ARE INFERRED

REMARKS: Surface elevation estimated from plan entitled "Site Plan", Drawing No. C-2, dated 1/7/00 by Tectonic Engineering Consultants P.C.

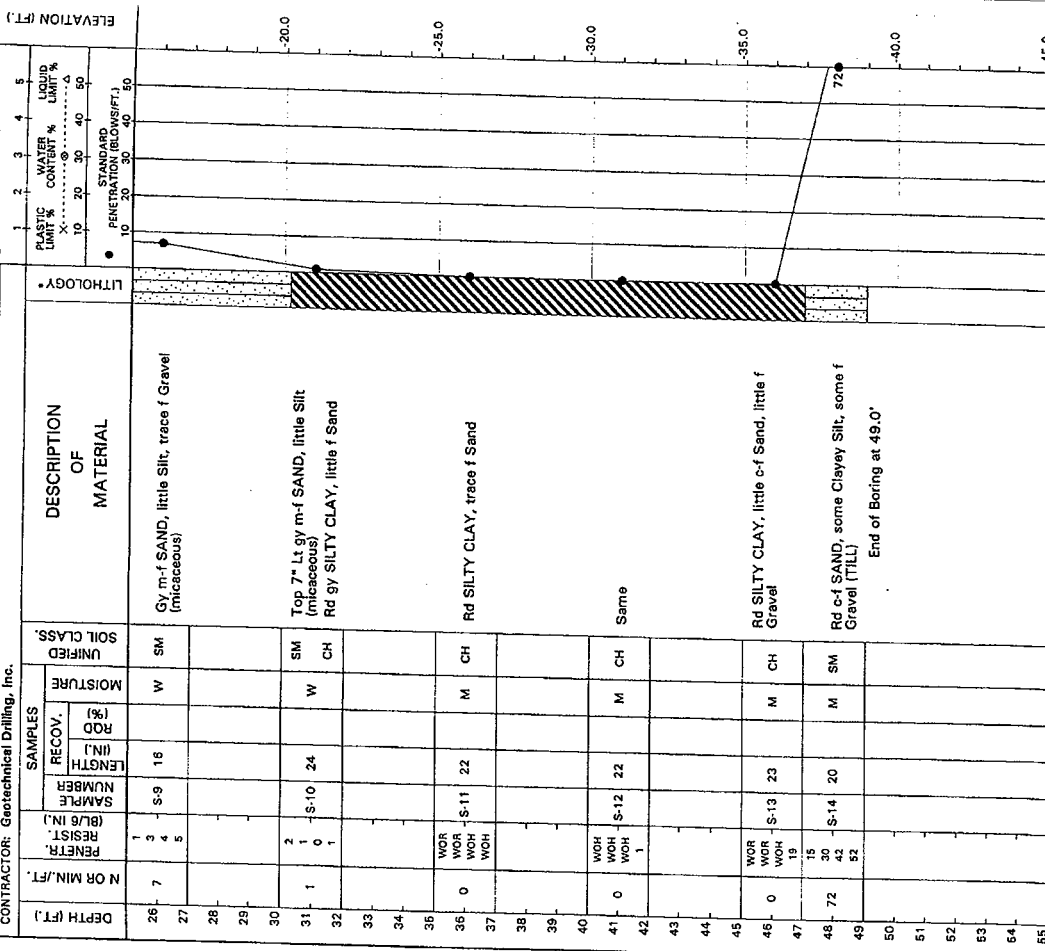
TECTONIC ENGINEERING CONSULTANTS P.C.

PROJECT No. 2323.126
 PRO. CT: East Hartford (CT-126)
 LOCATION: Hartford, CT

BORING No. B-3

CLIENT: AT&T Wireless PCS, LLC
 CONTRACTOR: Geotechnical Drilling, Inc.

SHEET No. 2 of 2



REMARKS: Surface elevation estimated from plan entitled "Site Plan", Drawing No. C-2, dated 1/7/00 by Tectonic Engineering Consultants P.C.

LEGEND FOR SOIL DESCRIPTION

<u>GRANULAR SOIL</u> (Coarser than No. 200 sieve)	
<u>DESCRIPTIVE TERM</u>	<u>GRAIN SIZE</u>
coarse - c	<u>SAND</u> No. 4 Sieve to No. 10 Sieve
medium - m	No. 10 Sieve to No. 40 Sieve
fine - f	No. 40 Sieve to No. 200 Sieve
<u>COBBLES</u>	3" to 10"
<u>BOULDERS</u>	10" +
<u>GRADATION DESIGNATIONS</u>	<u>PROPORTIONS OF COMPONENT</u>
fine, f	Less than 10% coarse and medium
medium to fine, m-f	Less than 10% coarse
medium, m	Less than 10% coarse and fine
coarse to medium, c-m	Less than 10% fine
coarse, c	Less than 10% medium and fine
coarse to fine, c-f	All greater than 10%
<u>COHESIVE SOIL</u> (Finer than No. 200 Sieve)	
<u>DESCRIPTION</u>	<u>PLASTICITY INDEX</u>
Silt	0 - 1
Clayey Silt	2 - 5
Silt & Clay	6 - 10
Clay & Silt	11 - 20
Silty Clay	21 - 40
Clay	greater than 40
	<u>ELASTICITY</u>
	none
	slight
	low
	medium
	high
	very high
<u>PROPORTION</u>	
<u>DESCRIPTIVE TERM</u>	<u>PERCENT OF SAMPLE BY WEIGHT</u>
trace	1 - 10
little	10 - 20
some	20 - 35
and	35 - 50
The primary component is fully capitalized.	
<u>COLOR</u>	
Blue - blue	Gy - gray
Blk - black	Or - orange
Bwn - brown	Rd - red
Gn - green	Tn - tan
	Wh - white
	Yl - yellow
	Lgt - light
	Dk - dark
<u>SAMPLE NOTATION</u>	
S - Split Spoon Soil Sample	WOC - Weight of Casing
U - Undisturbed Tube Sample	WOR - Weight of Rods
C - Core Sample	WOH - Weight of Hammer
B - Bulk Soil Sample	PPR - Compressive Strength based on pocket
NR - No Recovery of Sample	Pentrometer
	TV - Shear Strength (tsf) based on Torvane

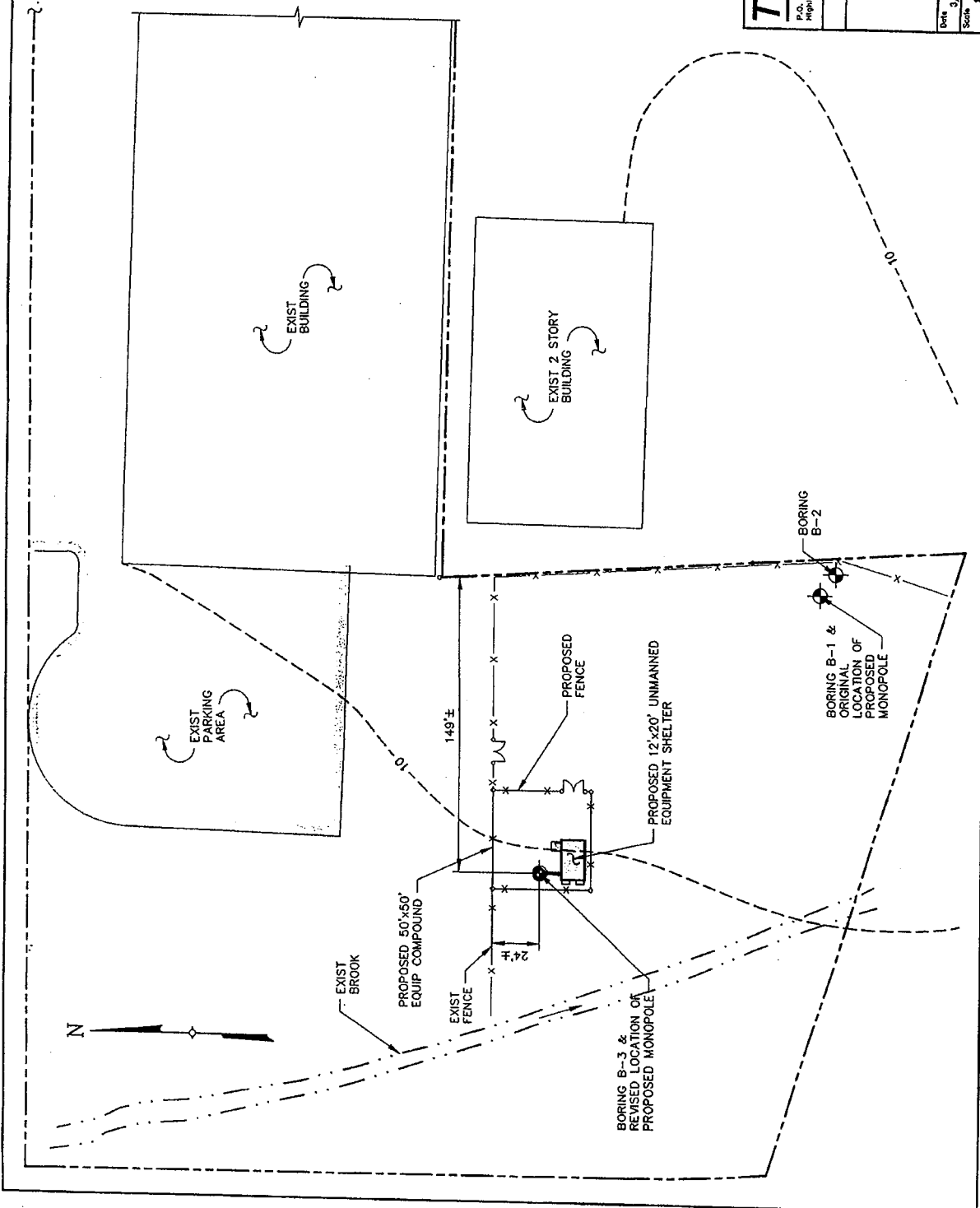
NOTES

1. PLAN BASED ON DRAWING ENTITLED "SITE DETAIL PLAN", DRAWING NO. C-2, REV. 1, DATED 1/7/00 BY TECTONIC ENGINEERING CONSULTANTS P.C.

TECTONIC ENGINEERING CONSULTANTS P.C.
 P.O. Box 447, 615 Route 32
 Highland Falls, N.Y. 10930
 (914) 928-8531

BORING LOCATION PLAN
 AT&T WIRELESS PCS SITE NO. CT-126
 PROPOSED 120-FOOT MONOPOLE
 REVISED MONOPOLE LOCATION
 223 BRAINARD ROAD, HARTFORD, CT

Date	3/16/00	Work Order	2323.126	Drawing No.	FIG-1	Rev	0
Scale	1"=60'						



TECTONIC ENGINEERING CONSULTANTS P.C.

OFFICES:
Albany, NY
Cornwall, NY
Mt. Vernon, NY

Cincinnati, OH
Northborough, MA
Richmond, VA

P.O. Box 37, 70 Pleasant Hill Road
Mountainville, New York 10953

(800) 929-6531 FAX: (914) 534-5999
www.tectonicengineering.com

Anil Mehta, Structural Engineer
City of Hartford
Department of Licenses and Inspections
550 Main Street
Hartford, CT 06103

June 12, 2000

RE: W.O. 2323.126
AT&T WIRELESS PCS SITE NO. CT-126
223 BRAINARD ROAD
HARTFORD, CT
APPLICATION #20000320
SUMMARY OF CONSTRUCTION INSPECTION

Dear Mr. Mehta:

The foundation for the monopole at the above referenced site was constructed on May 23 and 24, 2000. An engineer from this office was on site both days, and continuously inspected the construction work. In addition, the concrete was sampled and tested by a representative from Eastern Materials Testing Laboratory. Copies of the Field Reports (8 pages total) are attached.

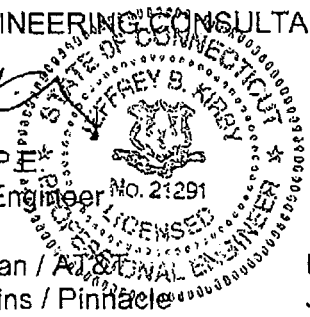
A total of twelve (12) concrete test cylinders (three sets of four) were cast. One cylinder from each set was tested at 7 days. The testing demonstrated that the 7-day strength of the concrete exceeds the specified 28-day requirement. Copies of the laboratory strength test reports (3 pages) are also attached.

On review of these reports, we find that the monopole foundation, as constructed, satisfies all of the design requirements shown on the plans.

If you have any questions or concerns, please contact me directly at (914) 534-5959.

Sincerely,

TECTONIC ENGINEERING CONSULTANTS P.C.

Jeffrey B. Kirby
Jeffrey B. Kirby, P.E.
Chief Structural Engineer No. 21291


cc: C. Chapman / AT&T D. Garber / AT&T
J. Desjardins / Pinnacle J. Hiller T. Critelli

file jk142/AT&T/Conn/126ConstInspRep

TECTONIC ENGINEERING CONSULTANTS P.C.	CAISSON INSTALLATION REPORT	Project No: 2323.126	Date: 5-23-00
	CAISSON NO: 1	Project: East Hartford (CT-166)	
		Location: 223 Rainard Rd Hartford CT.	

Client: AT & T Wireless PCS LLC	Tectonic's Representative: Myron Chaplin
Contractor: Buffalo Drilling Co.	Weather/Temp.: Cloudy, Rain
Contractor's Representative: Mark Brunning	Referenced Plans: Tectonic (1-7-00)
Drilling Machine: Type: LDH-80T	Structure: Monopole
Torque (ft.-lb.): 100,000 ft.-lb Downward Force (lb.): 50,000 lb	Surface Elevation: 13.0' (See Remarks)
Drilling Tool: Auger	SKETCH (include pertinent subsurface soil and/or rock profile and groundwater elevations)

DESIGN DATA

Coisson Location: Centerline of Monopole

Type: Open Cased Top 10' ± Cased

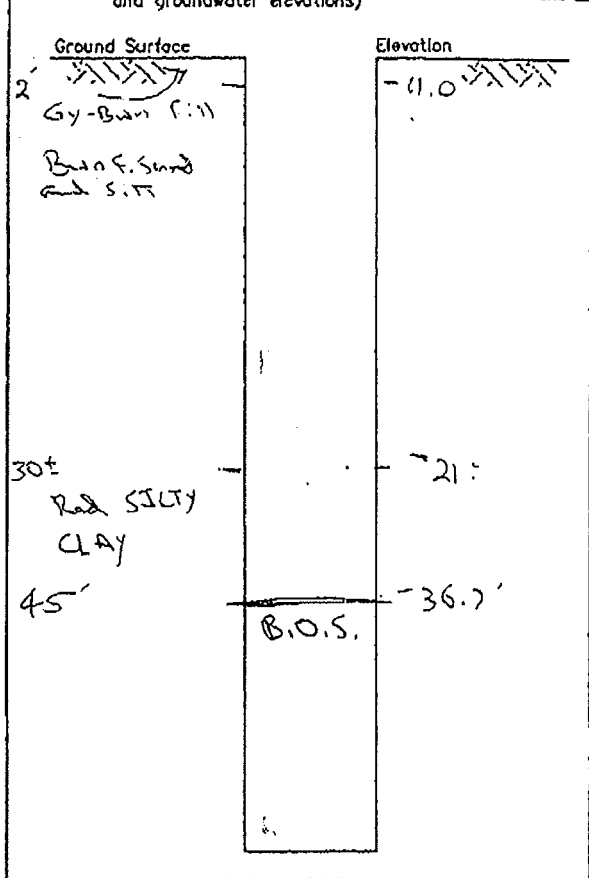
Diameter (in): 8.4

Top Elevation: 13.5 ±

Bottom Elevation: -31.0 ±

Length (ft): 44.5 ±

Bell Diameter (in): NA



AS-BUILT DATA

Date Drilling Started: 5-23-00

Date Drilling Completed: 5-24-00

Date Cleaning Completed: 5-24-00

Date Caisson Accepted: 5-24-00

Diameter (in): 8.4 ±

Top Elevation: 13.7

Bottom Elevation: -36.3 } Estimated

Total Length (ft): 45.0

Bell Diameter (in): NA

Deviation from Vertical: None observed

Proof Test Hole: Yes No Depth (ft.)

Description of Proof Test Hole: NA

Drilling Slurry (If used note type and proportion of additive and, if required, density, viscosity, sand content, etc.) Share Pac GCV, a polymer slurry by Cetco.

Casing (type, diameter and length) Steel, 7.3" Ø x 10.8' length
from approximately 1.5' to 11.3' deep

Steel Reinforcement (no. bars, size and length) 30 # 10 Vertical w/ # 4 hoops as specified

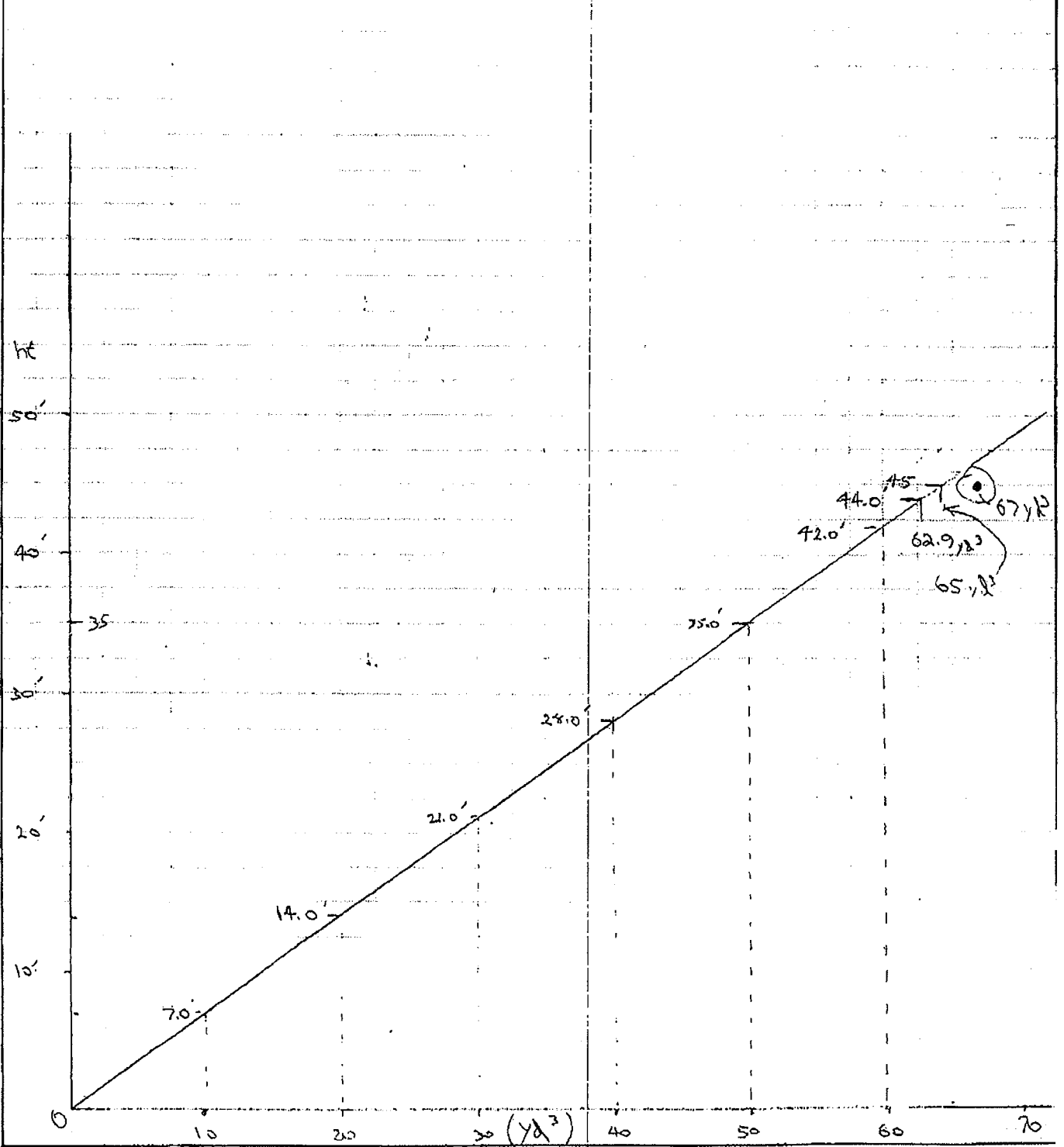
Concrete: Date Concrete Placed: 5-24-00 Method Placed: Pumped Tremie Volume in Caisson: 67 yd³
 (Refer to Attached Concrete Inspection and Test Report Form for Concrete Data) Inspection Performed by: Others.

REMARKS: (setbacks, cave-ins, cavities, waterflow, slurry lost, etc.) Elevation measured using sight-level and near-by Bench Mark (Elevation accurate to less than 0.5')
GC: Bois Construction Corp. (John Spiegel)

TECTONIC ENGINEERING CONSULTANTS P.C.
 Highland Mills, NY
 Richmond, VA
 Albany, NY
 Northborough, MA
 Cincinnati, OH
 (800) 829-6531

JOB 2323.126 East Hartford (CT-126)
 SHEET NO 4 OF 7
 CALCULATED BY MCR DATE 5-23-00
 CHECKED BY _____ DATE _____
 SCALE _____

Theoretical Volume (yd³) vs. Drilled Shaft Height (ft) For a 7' diameter shaft





FIELD REPORT



Project: East Hartford Client: Tectonic Engineering
 Monopole 2323.126
 East Hartford, CT Contractor: Brois Construction
 Project No.: 00402C Weather: partly cloudy
 Date: May 24, 2000

Purpose: To review concrete construction and fabricate specimens for strength testing.

Contractor Activities:

Upon arrival at the site, it was observed that Brois Construction had prepared a ringed rebar cage. The cage was lowered by crane into position into a pre-drilled hole measuring 6-feet in diameter and approximately 43-feet deep. Buffalo Drilling subsequently pumped 80-cubic yards of 5,000 psi concrete that was supplied by Builder's Concrete into the prepared location. American Concrete Pumping Company was contracted to provide the concrete pumping. Upon placement, the concrete was manually worked into position and vibrated.

JGI Activities:

Concrete compressive strength test cylinders were fabricated from today's concrete placement in accordance with ASTM C 31. Refer to the Concrete Strength Test Summary of this date for details.

Locations of today's project activities are illustrated on the attached Field Sketch.

Prepared by: B. Harris

Reviewed by: MGH Date: 5/31/00

TEST RESULTS	<input type="checkbox"/> DO	<input type="checkbox"/> DO NOT COMPLY WITH SPECIFICATIONS
	<input type="checkbox"/> ARE NOT COMPLETE	OR <input checked="" type="checkbox"/> ARE NOT APPLICABLE
A DEVIATION REPORT	<input type="checkbox"/> IS ATTACHED	<input checked="" type="checkbox"/> IS NOT ATTACHED
	<input type="checkbox"/> HAS BEEN AMENDED AND	IS ATTACHED
OBSERVED CONSTRUCTION	<input checked="" type="checkbox"/> DOES	<input type="checkbox"/> DOES NOT COMPLY WITH SPECIFICATIONS
	<input type="checkbox"/> IS NOT COMPLETE	<input type="checkbox"/> NOT APPLICABLE

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FIELD SKETCH

Project: EAST HARTFORD MONOPOLE

Project No.: 00402 C

Date: 5-24



a Division of Jaworski Geotech, Inc.

BRANARD Rd ↘

North

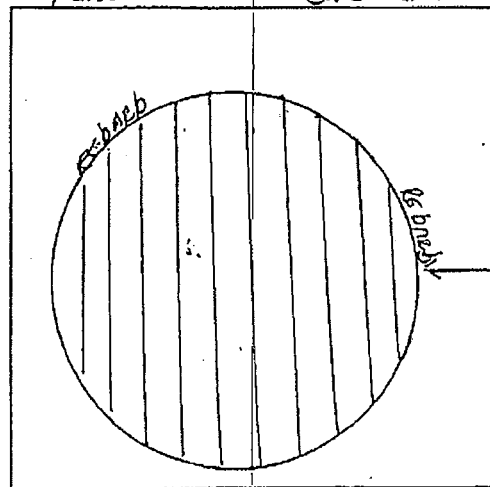


HUSKY HARDWOOD

PARKING LOT CYLINDER SAMPLES

FENCE

GATE ENTRANCE



CONCRETE PLACEMENT



Eastern Materials Testing Laboratory
a division of
JAWORSKI GEOTECH, INC.



NVLAP #10315-0

CONCRETE DATA SUMMARY

Project: East Hartford Monopole
East Hartford, CT
Client: Tectonic Consultants
Supplier: Builder's Concrete

Project No.: 00402C
Contractor: Brois Construction
SubContractor: Buffalo Drilling
JGI Representative: B. Harris

PLACEMENT DATA

Placement Date: 5/24/00
Time: 1:45
Class Concrete: 5,000 psi
Total Quantity 80
Batch Quantity: 10 cy
Method of Placement: chute, pump
Location of sample: .43' below top of placement

Cylinder Set No.: C1
Truck No.: 19
Ticket No.: 91724
Batch Time: 1:25
Air: Specified: 4-7%
Measured: 3.75 %
Slump Specified: 3-5"
Measured: 5"

Total Location of Placement:
cell tower footing

Unit Weight: 149.21 lbs/cu./ft.
Plastic Wt.: Cylinder Wt.:

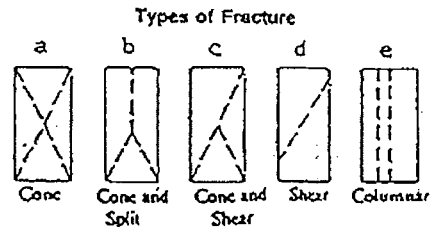
Cylinder Size: 6 x 12 inches
End Area: 28.27 sq in

Concrete Temperature: 80 degrees F
Ambient Temp: 82 degrees
Date Retrieved:
Method of Compression: Neoprene Caps

BATCH TICKET INFORMATION (reduced to 1 cubic yard)

Cem1	749.0	lbs./cu.yd	Sand:	1206.0	lbs./cu.yd
Cem2		lbs./cu.yd	Water:	241.0	lbs./cu.yd
Cem3		lbs./cu.yd	Ad1 NCA	152.0	oz/cu.yd
Agg 1 3/4"	1080.0	lbs./cu.yd	Ad2 Air	3.8	oz/cu.yd
Agg 2 1/2"	730.0	lbs./cu.yd	Ad3		oz/cu.yd
Agg 3		lbs./cu.yd	Ad4		oz/100 CWT

Sand Moisture: 4.5% Stone Moisture:



COMPRESSIVE STRENGTH DATA

Cylinder ID	C 1 A	C 1 B	C 1 C	C 1 D
Date Cast	5/24/00	5/24/00	5/24/00	5/24/00
Date Tested	5/31/00	6/21/00	6/21/00	7/19/00
Specimen Age	(7 days)	(28 days)	(28 days)	(56 days)
Cyl.Weight(lbs.)	29.28	29.18	29.08	29.10
Load (lbs.)	97,888			
Stress (psi)	3,460			
Type of Fracture	a			

Reviewed by: _____ Date: 5/31/00

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Eastern Materials Testing Laboratory
a division of
JAWORSKI GEOTECH, INC.



NVLAP #10315-0

CONCRETE DATA SUMMARY

Project: East Hartford Monopole
East Hartford, CT
Client: Tectonic Consultants
Supplier: builder's concrete

Project No.: 00402C
Contractor: Brois Construction
SubContractor: Buffalo Drilling
JGI Representative: B. Harris

PLACEMENT DATA

Placement Date: 5/24/00
Time: 2:30
Class Concrete: 5,000 psi
Total Quantity 80
Batch Quantity: 10 cy
Method of Placement: chute, pump
Location of Sample: 43' below top of placement
Total Location of Placement:
cell tower footing

Cylinder Set No.: C2
Truck No.: 18
Ticket No.: 91727
Batch Time: 2:00
Air: Specified: 4-7%
Measured: 2.5%
Slump Specified: 3-5"
Measured: 6.25"

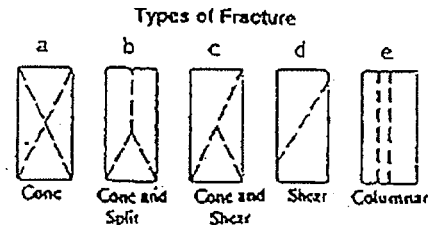
Unit Weight: 148.19 lbs./cu./ft.
Plastic Wt.: Cylinder wt.:
Concrete Temperature: 80 degrees F
Ambient Temp: 82 degrees
Date Retrieved:
Method of Compression: Neoprene Caps

Cylinder Size: 6 x 12 inches
End Area: 28.27 sq in

BATCH TICKET INFORMATION (reduced to 1 cubic yard)

Cem1	750.0	lbs./cu./yd	Sand:	1212.0	lbs./cu./yd
Cem2		lbs./cu./yd	Water:	231.5	lbs./cu./yd
Cem3		lbs./cu./yd	Ad1 NCA	152.0	oz/cu./yd
Agg 1 3/4"	1080.0	lbs./cu./yd	Ad2 Air	3.8	oz/cu./yd
Agg 2 1/2"	730.0	lbs./cu./yd	Ad3		oz/cu./yd
Agg 3		lbs./cu./yd	Ad4		oz/100 CWT

Sand Moisture: 4.5% Stone Moisture:



COMPRESSIVE STRENGTH DATA

Cylinder ID	C 2 A	C 2 B	C 2 C	C 2 D
Date Cast	5/24/00	5/24/00	5/24/00	5/24/00
Date Tested	5/31/00	6/21/00	6/21/00	7/19/00
Specimen Age	(7 days)	(28 days)	(28 days)	(56 days)
Cyl. Weight (lbs.)	29.08	29.64	29.28	29.36
Load (lbs.)	109,950			
Stress (psi)	3,890			
Type of Fracture	a			

Reviewed by: [Signature] Date: 5/31/00

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Eastern Materials Testing Laboratory
a division of
JAWORSKI GEOTECH, INC.



NVLAP #10315-0

CONCRETE DATA SUMMARY

Project: East Hartford Monopole
East Hartford, CT
Client: Tectonic Consultants
Supplier: Builder's Concrete

Project No.: 00402C
Contractor: Brois Construction
SubContractor: Buffalo Drilling
JGI Representative: B. Harris

PLACEMENT DATA

Placement Date: 5/24/00
Time: 3:45
Class Concrete: 5,000 psi
Total Quantity 80
Batch Quantity: 10 cy
Method of Placement: chute, pump
Location of Sample: .43' below top of placement

Total Location of Placement:
cell tower footing

Cylinder Set No.: C3
Truck No.: 19
Ticket No.: 91730
Batch Time: 2:30

Air: Specified: 4-7%
Measured: 4.5%

slump Specified: 3-5"
Measured: 5"

Unit weight: 146.87 lbs/cu./ft.
Plastic wt.: Cylinder wt.:

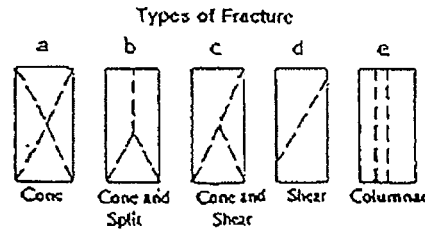
Concrete Temperature: 80 degrees F
Ambient Temp: 82 degrees
Date Retrieved:
Method of Compression: Neoprene Caps

Cylinder Size: 6 x 12 inches
End Area: 28.27 sq in

BATCH TICKET INFORMATION (reduced to 1 cubic yard)

Cem1	750.0	lbs./cu./yd	Sand:	1214.0	lbs./cu./yd
Cem2		lbs./cu./yd	Water:	247.0	lbs./cu./yd
Cem3		lbs./cu./yd	Ad1 NCA	152.0	oz/cu./yd
Agg 1 3/4"	1080.0	lbs./cu./yd	Ad2 Air	3.8	oz/cu./yd
Agg 2 1/2"	722.0	lbs./cu./yd	Ad3		oz/cu./yd
Agg 3		lbs./cu./yd	Ad4		oz/100 CWT

Sand Moisture: Stone Moisture:



COMPRESSIVE STRENGTH DATA

Cylinder ID	C 3 A	C 3 B	C 3 C	C 3 D
Date Cast	5/24/00	5/24/00	5/24/00	5/24/00
Date Tested	5/31/00	6/21/00	6/21/00	7/19/00
Specimen Age	(7 days)	(28 days)	(28 days)	(56 days)
Cyl.Weight(lbs.)	28.82	28.80	28.84	28.84
Load (lbs.)	100,260			
Stress (psi)	3,550			
Type of Fracture	a			

Reviewed by: _____ Date: 5/31/00

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Daniel F. Caruso
Chairman

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

October 1, 2008

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

RE: **EM-VER-064-080912** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 223 Brainard Road, Hartford, Connecticut.

Dear Attorney Baldwin:

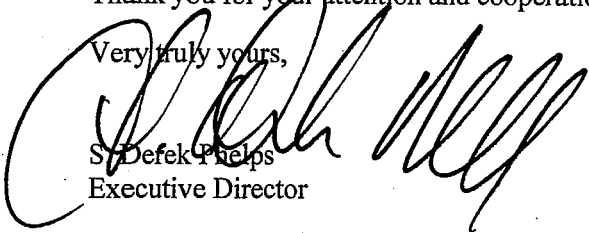
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the condition that the foundation be analyzed for adequacy and a signed letter from a Professional Engineer duly licensed in the State of Connecticut is submitted to the Council to certify that the foundation is adequate to support the proposed loading, or in the alternative, that reinforcements were performed to bring the foundation rating to not more than 100 percent.

The proposed modifications are to be implemented as specified here and in your notice dated September 12, 2008, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Thank you for your attention and cooperation.

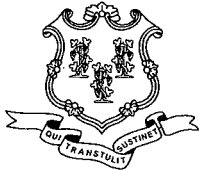
Very truly yours,



Stefek Phelps
Executive Director

SDP/MP/jb

- c: The Honorable Eddie A. Perez, Mayor, City of Hartford
- Lee C. Erdmann, Chief Operating Officer, City of Hartford
- Roger J. O'Brien, Director of Planning, City of Hartford
- Christopher B. Fisher, Esq., Cuddy & Feder LLP



Daniel F. Caruso
Chairman

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

September 16, 2008

The Honorable Eddie A. Perez
Mayor
City of Hartford
Municipal Building
550 Main Street
Hartford, CT 06103

RE: **EM-VER-064-080912** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 223 Brainard Road, Hartford, Connecticut.

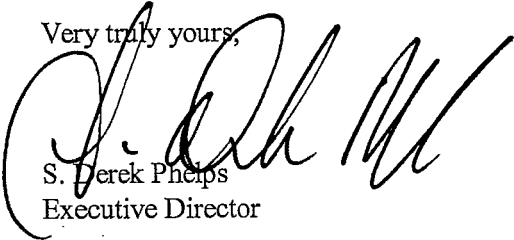
Dear Mayor Perez:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by September 30, 2008.

Thank you for your cooperation and consideration.

Very truly yours,


S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Roger J. O'Brien, Director of Planning, City of Hartford

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

ORIGINAL

September 12, 2008

Via Hand Delivery

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

RECEIVED
SEP 12 2008
CONNECTICUT
SITING COUNCIL

Re: **Notice of Exempt Modification
223 Brainard Road, Hartford, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on the existing 98-foot monopole tower owned by AT&T and located at 223 Brainard Road in Hartford, Connecticut. Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Eddie A. Perez, Mayor of the City of Hartford. Pursuant to a Council directive, a copy of this letter is also being sent to 221-233 Brainard Road LLC, the owner of the property on which the tower is located.

The facility consists of a 98-foot monopole tower capable of supporting multiple carriers at 223 Brainard Road in Hartford. AT&T antennas located at the 98-foot level on the tower. Cellco intends to install four (4) LPA-80063/4CF; two (2) LPA-80080/4CF; four (4) LPA-185063/8CF and two (2) LPA-185080/8CF antennas at the 88-foot level on the tower. Associated equipment, including a propane fueled back-up generator, will be located within a 12' x 30' equipment shelter on the ground adjacent to the tower. Cellco will also install a 1000 gallon propane tank adjacent to its shelter. Attached behind Tab 1 are Project Plans for the proposed Cellco facility.

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



Law Offices

BOSTON

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

SARASOTA

www.rc.com

HART1-1478007-1

ROBINSON & COLE^{LLP}

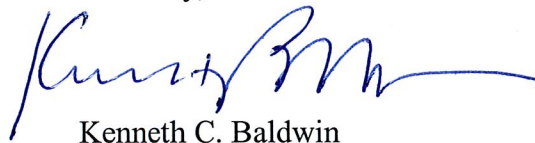
S. Derek Phelps
September 12, 2008
Page 2

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 88-foot level on the 98-foot tower.
2. The proposed installation of the associated equipment shelter and propane tank will not require an extension of the fenced compound or the lease area.
3. The proposed installation will not increase the noise levels at the facility by six decibels or more.
4. The operation of the antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. The RF power density calculations for Cellco antennas would be 24.65% of the FCC standard. A power density calculations table is included behind Tab 2.

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

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

Sincerely,



Kenneth C. Baldwin

Attachments

Copy to:

Eddie A. Perez, Hartford Mayor
221-233 Brainard Road LLC
Sandy M. Carter
Michelle Kababik



HARTFORD SOUTH 4
223 BRAINARD ROAD
HARTFORD, CONNECTICUT 06114

PROJECT SUMMARY

SITE NAME:	HARTFORD SOUTH 4
SITE ADDRESS:	223 BRAINARD ROAD HARTFORD, CONNECTICUT 06114
CONTACT PERSON:	VERIZON WIRELESS (860) 382-4245
TOWER OWNER:	AXIS MOBILITY 2405 WINDWARD PARKWAY FARMINGTON, CT 06030
CONCRETE CODE:	CONNECTICUT BUILDING CODES CONNECTICUT LIFE SAFETY CODES
JURISDICTION:	CONNECTICUT STATE COUNCIL
APPLICANT:	VERIZON WIRELESS 223 BRAINARD ROAD HARTFORD, CT 06108
ARCHITECT:	URS CORPORATION A.E.S. 300 ENTERPRISE DRIVE SUITE 3B ROCKY HILL, CT 06866
M/E/P ENGINEER:	URS CORPORATION A.E.S. 300 ENTERPRISE DRIVE SUITE 3B ROCKY HILL, CT 06866
LATITUDE:	41° 45' 58.1" NAD 83
LONGITUDE:	72° 39' 43.8" NAD 83

LEGEND

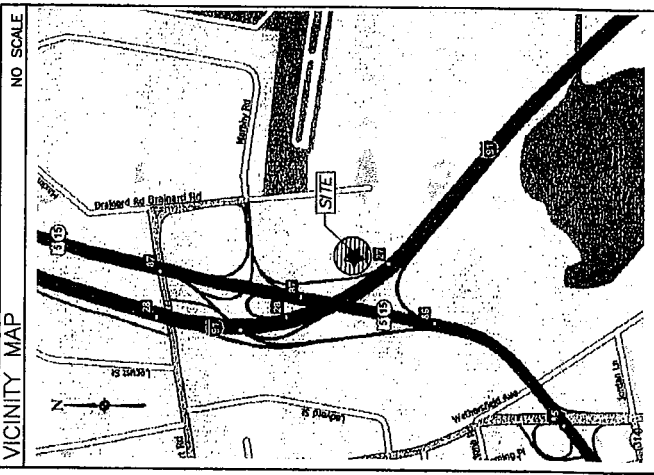
SYMBOL	DESCRIPTION
	SECTION OR DETAIL NUMBER
	SHEET WHERE DETAIL/SECTION OCCURS
	ELEVATION NUMBER
	SHEET WHERE ELEVATION OCCURS

ABBREVIATIONS

UNL.	UNLAWFUL
V.L.C.	VERTICAL CURVE
O.C.	ON CENTER
P.S.F.	POUNDS/SQUARE FOOT
TYP.	TYPICAL
T.O.C.	TOP OF CONCRETE
F.T.	FEET
S.F.T.	SQUARE FEET
N/A	NOT APPLICABLE

SHEET INDEX

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET - GENERAL NOTES AND LEGENDS
SC-1	COMPOUND PLAN, ELEVATION AND ANTENNA CREATION PLAN



GENERAL NOTES

- THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND POSITIONS OF ALL PROJECT OWNER'S EQUIPMENT ARE SHOWN IN ILLUSTRATIVE FORM. THESE DRAWINGS ARE NOT INTENDED TO PROVIDE ALL NECESSARY DETAILS AND FINAL LOCATIONS MAY VARY.
- THE PROJECT OWNER'S PCS FACILITY IS AN UNMANNED PRIVATE AND SECURED FACILITY. ACCESS TO THE FACILITY IS ONLY ACCESSIBLE BY TRAINED PERSONNEL FOR PERIODIC MAINTENANCE. THE FACILITY IS NOT COVERED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- THE DESIGN OF THE ANTENNA MOUNTING HARDWARE WILL MEET THE REQUIREMENTS OF THE LOCAL BUILDING CODE, STATE BUILDING CODE, INTERNATIONAL BUILDING CODE, AND STATE BUILDING CODE REQUIREMENTS. DETAILED CONSTRUCTION REQUIREMENTS WILL BE PROVIDED TO THE CONTRACTOR BY THE PROFESSIONAL ENGINEER AND SUBMITTED WITH A BUILDING PERMIT APPLICATION FOR REVIEW AND APPROVAL BY THE LOCAL BUILDING CODE ENFORCEMENT OFFICIAL.
- ONCE THE FACILITY BECOMES FULLY OPERATIONAL, NORMAL AND ROUTINE MAINTENANCE REQUIREMENTS WILL BE PROVIDED TO THE CONTRACTOR. THE ESTIMATED MAINTENANCE RATE IS 2 TIMES PER MONTH, THE AVERAGE DAILY TRIP GENERATION RATE (ADT) IS 0.07.

CELLCO PARTNERSHIP
DBA
verizon wireless

URS CORPORATION A.E.S.
300 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
1-800-928-8882

STATE OF CONNECTICUT REGISTERED ARCHITECT

SITE NAME: HARTFORD SOUTH 4
PROJECT ID: 2008284644
PROJECT TYPE: PCS/O
LOCATION CODE: 189830
SITE ADDRESS:
2232 BRAINARD ROAD
HARTFORD, CONNECTICUT
06114

PROJECT NO: 38931138
JOB NO: VZ-062
DRAWN BY: KAP
CHECKED BY: MAF

ISSUED FOR
A 10-10-08 REVIEW
B 10-11-08 FINAL CORRECT

THE INFORMATION CONTAINED
HEREIN IS THE PROPERTY OF URS
CORPORATION. ANY USE OR DISCLOSURE
HEREOF BY ANY OTHER PERSON
WITHOUT THE WRITTEN PERMISSION
OF URS IS STRICTLY PROHIBITED.

HARTFORD SOUTH 4
223 BRAINARD ROAD
HARTFORD, CONNECTICUT
06114

SCALE: AS NOTED

**TITLE SHEET -
PROJECT SUMMARY
AND LEGENDS**

T-1

CELCO PARTNERSHIP
DBA
verizon wireless

BNS CORPORATION AES
500 ENTERPRISE DRIVE
SUITE 3B
ROCKY HILL, CONNECTICUT
08601-3802

STATE OF CONNECTICUT
DESIGNED AND DRAWN BY
DATE

SITE NAME: HARTFORD SOUTH 4
PROJECT ID: 2008094644
PROJECT TYPE: PCS/CO
LOCATION CODE: 188930
SITE ADDRESS:
233 BRAINARD ROAD
HARTFORD, CONNECTICUT
06114

PROJECT NO.: 35931133
JOB NO.: VZ4-062
DRAWN BY: X-AP
CHECKED BY: MJE

ISSUED FOR
1 10-11-06
0 10-11-06 ENGINE CORRE

THE INFORMATION CONTAINED
IN THIS SET OF DOCUMENTS
IS PROPRIETARY BY NATURE.
IT IS TO BE KEPT CONFIDENTIAL
AND NOT TO BE REPRODUCED OR
OTHER THAN THAT WHICH
RELATES TO VERIZON WIRELESS
IS STRICTLY PROHIBITED.

HARTFORD SOUTH 4
233 BRAINARD ROAD
HARTFORD, CONNECTICUT
06114

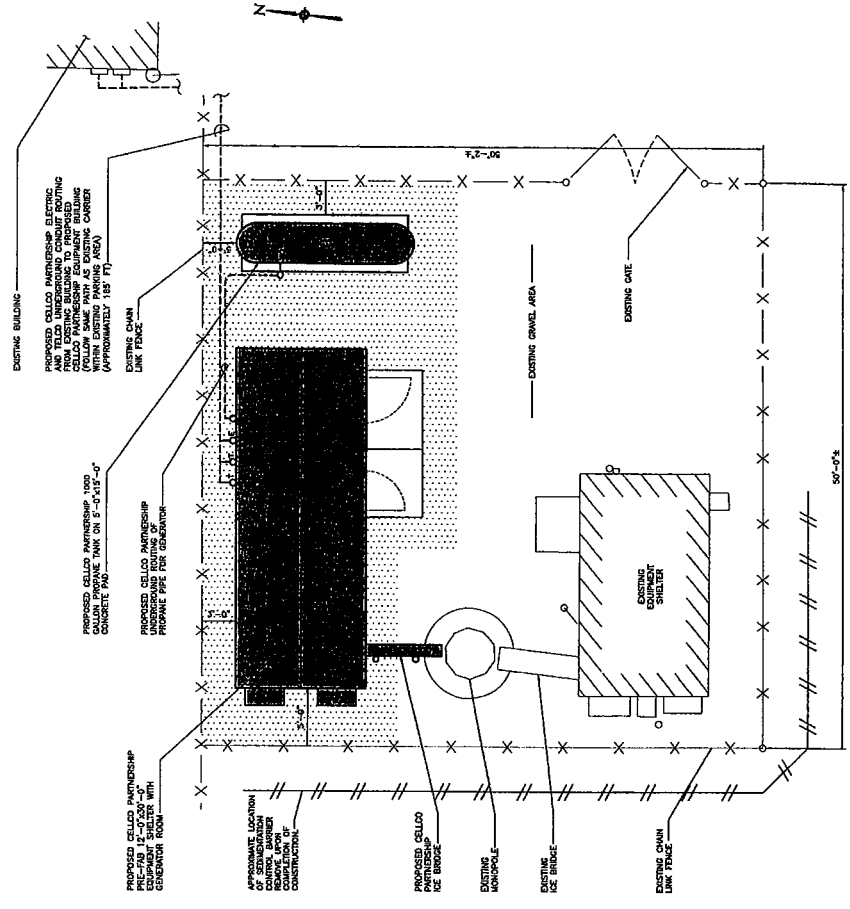
SCALE: AS NOTED

COMPOUND PLAN,
ELEVATION AND
ANTENNA
ORIENTATION PLAN

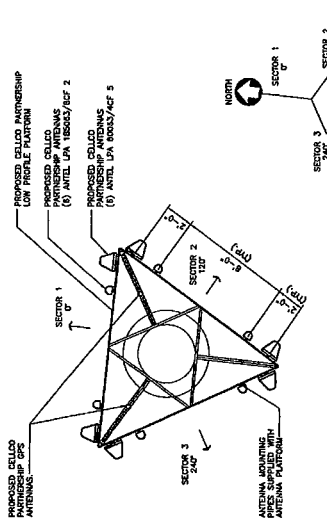
SC-1

DESCRIPTION	LEGEND	PROPOSED
PROPERTY LINE	---	---
LEASE LINE	---	---
CHAIN LINK FENCE	---	---
CONTOUR LINES	---	---
UNDERGROUND UTILITIES	---	---
UTILITY POLE	---	---
TREE LINE	---	---
SEMI-PORTABLE FENCE	---	---
WOOD FENCE	---	---

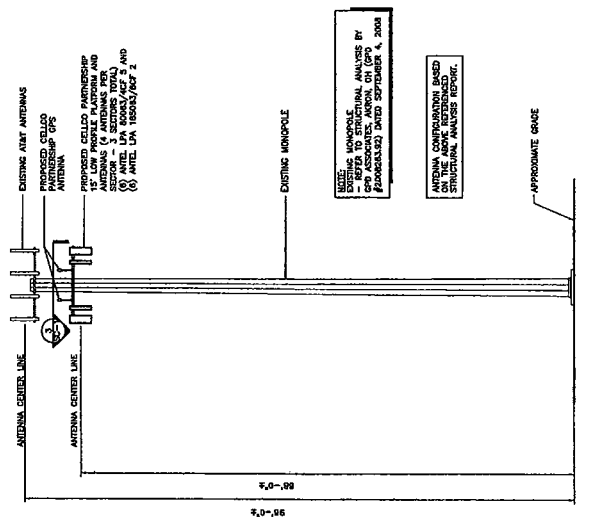
SITE PLAN INFORMATION
THIS SITE PLAN DRAWING WAS COMPILED FROM DATA
OBTAINED FROM THE SUBJECT PROPERTY AND IS
CONSIDERED TO BE A REPRESENTATIVE AND
ACCURATE REPRESENTATION OF THE SUBJECT AREA.



1 COMPOUND PLAN
SCALE: 1"=50'-0"
SC-1



3 ANTENNA ORIENTATION PLAN
SCALE: N.T.S.
SC-1



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

USE: EXISTING MONOPOLE
PROPOSED ANTENNA ANALYSIS BY
CELLCO PARTNERSHIP, ON 10/24/06
(#188930) DATED SEPTEMBER 4, 2006

ANTENNA CENTER LINE PLACED
ON THE ABOVE REFERENCED
STRUCTURE ANALYSIS REPORT.

General Power Density

Site Name: Hartford S 4, CT
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure* (mW/cm ²)	Fraction of MPE (%)
VZW PCS	1970	3	375	1125	88	0.0522	1.0	5.22%
VZW	880	9	271	2439	88	0.1133	0.583	19.43%

Total Percentage of Maximum Permissible Exposure

24.65%

*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/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used.



at&t

Glynn Walker
AT&T Mobility
5405 Windward Pkwy
Alpharetta GA, 30004
(770) 708-6122



GPD ASSOCIATES

Kevin Clements
520 South Main St., Suite 2531
Akron, Ohio 44311
(330) 572-2195
kclements@gpdgroup.com

GPD# 2008263.92
September 4, 2008

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION: Site USID: 4539
Site FA: 10071011
Site Name: EAST HARTFORD HOCHANUM

VERIZON DESIGNATION: Site Name: Hartford South-4
Site Number: Hartford South-4

ANALYSIS CRITERIA: Codes: TIA/EIA-222-F & 2003 IBC
80-mph with 0" ice
69-mph with 1/2" ice

SITE DATA: 223 Brainard Road, Hartford, CT 06114, Hartford County
Latitude 41° 43' 58.0" N, Longitude 72° 39' 42.8" W
98' Monopole

Mr. Walker,

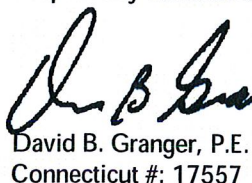
GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the addition of the following proposed loading configuration:

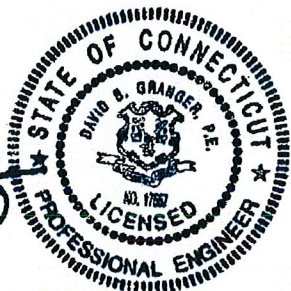
Elev. 88' (6) Antel LPA-80063/4CF_5 Antennas on a 13' PiROD LP Platform, w/ (6) 1-5/8" internal coax
(6) Antel LPA-185063/8CF_2 Antennas on the same Platform, w/ (6) 1-5/8" internal coax

Based on our analysis we have determined the tower is sufficient for the proposed, existing, and reserved loadings as referenced in Appendix A. However, the foundation could not be verified based on the information provided.

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T. If you have any questions please do not hesitate to call.

Respectfully submitted,


David B. Granger, P.E.
Connecticut #: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify that the existing structure is capable of carrying the proposed loading configuration as specified by Verizon Wireless to AT&T. This report was commissioned by Mr. Glynn Walker of AT&T.

No foundation or geotechnical information was available or provided for this report. Therefore, the in place capacity of the existing foundation could not be verified. A geotechnical investigation and foundation exploration are recommended to verify the capacity of the foundation with the proposed loading.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	62.0%	Pass
Base Plate	43.6%	Pass
Anchor Rods	50.4%	Pass
Foundation	Not Verified	N/A

ANALYSIS METHOD

RISA Tower (Version 5.2.0.1), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information.

DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Wireless Co-location document	G. Walker
Tower Mapping	GPD Associates and STG Communications, dated 8/15/08	GPD
Co-Location Application	Verizon Wireless Application, dated 4/15/08	G. Walker

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the monopole. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified. In the case of absent foundation data, it is the tower owner's responsibility to insure that the foundation system is adequate to support the structure with its new reactions.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications, if any, are assumed to be as per data supplied/available, to have been properly installed and to be fully effective.
9. Tower Mounted Amplifiers are assumed to be installed behind antennas.
10. All existing loading was obtained from the provided Preliminary Tower Summary, site photos and the Tower Mapping performed by GPD Associates and STG Communications on 8/15/08 and is assumed to be accurate.
11. All proposed coax is assumed to be internal to the monopole.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Associates should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD ASSOCIATES has performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD ASSOCIATES in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD ASSOCIATES does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD ASSOCIATES provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD ASSOCIATES, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD ASSOCIATES makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD ASSOCIATES will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD ASSOCIATES pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info	
Site Name	EAST HARTFORD HOCHANUM
Site Number	4539
Site FA	10071011
Date of Analysis	9/4/2008
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	
Tower Type (G, SST, MP)	MP
Tower Height (top of steel AGL)	98
Tower Manufacturer	n/a
Tower Model	n/a
Manufacturer Design	n/a
Foundation Design	n/a
Geotech Report	n/a
Tower Mapping	GPD and STG Communications
Foundation Mapping	8/15/2008
Previous Structural	n/a

Design Parameters	
Design Code Used	TIA/EIA-222-F
Location of Tower (County, State)	Hartford, Connecticut
Basic Wind Speed (mph)	80-fastest
Ice Thickness (in)	0.5"
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)	
Existing Condition	
Tower	42.2%
Foundation	n/a
Guy Wire	n/a

Note: Foundation not Verified

Proposed Condition	
Tower	62.0%
Foundation	n/a
Guy Wire	n/a

Note: Foundation not Verified

Steel Yield Strength (ksi)	
Pole	50
Base Plate	50
Anchor Rods	75

Note: Yield Strengths Assumed

Existing/Reserved

Antenna		Mount			Transmission Line			
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft ²) total	Quantity	Size	Attachment Leg/Face
AT&T Mobility	98	6	Panel	7770.00	5.88	12	1-1/4"	Internal
AT&T Mobility	98	6	TMA	LGP21401	shielded			

Proposed

Antenna		Mount			Transmission Line			
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft ²) total	Quantity	Size	Attachment Leg/Face
Verizon Wireless	88	6	Panel	LPA-80063/4CF_5	7.01	6	1-5/8"	Internal
Verizon Wireless	88	6	Panel	LPA-185063/8CF_2	2.97	6	1-3/8"	Internal

Future

Antenna		Mount			Transmission Line			
Antenna Owner	Attachment Height (ft)	Quantity	Type	Model	EPA (ft ²) total	Quantity	Size	Attachment Leg/Face
AT&T Mobility	98	3	Panel	7770.00	5.88			

Note: Future loading is in addition to the existing loading at the same elevation.

Revision: 1.2
Date: 12/15/06

APPENDIX B

RISA Tower Output File

RISATower GPD Group 520 South Main Street, Suite 2531 Akron, OH 44311 Phone: 330.572.2100 FAX: 330.572.2103	Job 4539 EAST HARTFORD HOCHANUM	Page 1 of 2
	Project 2008263.92	Date 10:18:14 09/04/08
	Client AT&T MOBILITY	Designed by M. Moellendick

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 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
					No Ice	1/2" Ice		
LDF6-50A (1-1/4 FOAM) (ATT)	A	No	Inside Pole	98.00 - 8.00	12	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
LDF7-50A (1-5/8 FOAM) (VERIZON)	B	No	Inside Pole	88.00 - 8.00	12	No Ice 1/2" Ice	0.00 0.00	0.00 0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
			Horz ft	Lateral ft						
Valmont 13' Platform w/o rails (GPD) (ATT)	A	None			0.0000	98.00	No Ice 1/2" Ice	24.80 26.20	24.80 26.20	1.50 2.50
(3) 7770.00 (ATT)	A	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07
(3) 7770.00 (ATT)	B	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07
(3) 7770.00 (ATT)	C	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	0.04 0.07

RISATower GPD Group 520 South Main Street, Suite 2531 Akron, OH 44311 Phone: 330.572.2100 FAX: 330.572.2103	Job 4539 EAST HARTFORD HOCHANUM	Page 2 of 2
	Project 2008263.92	Date 10:18:14 09/04/08
	Client AT&T MOBILITY	Designed by M. Moellendick

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
(2) LGP21401 (ATT)	A	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(2) LGP21401 (ATT)	B	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
(2) LGP21401 (ATT)	C	From Centroid-Face	4.00 0.00 2.25		0.0000	98.00	No Ice 1/2" Ice	0.00 0.00	0.23 0.31	0.01 0.02
PIROD 13' Low Profile Platform (VERIZON)	A	None			0.0000	90.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(2) LPA-80063/4CF (VERIZON)	A	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-80063/4CF (VERIZON)	B	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-80063/4CF (VERIZON)	C	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	7.01 7.42	6.08 6.48	0.02 0.07
(2) LPA-185063/8CFx2 (VERIZON)	A	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03
(2) LPA-185063/8CFx2 (VERIZON)	B	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03
(2) LPA-185063/8CFx2 (VERIZON)	C	From Centroid-Face	4.00 0.00 -2.00		0.0000	90.00	No Ice 1/2" Ice	2.97 3.30	2.75 3.05	0.01 0.03

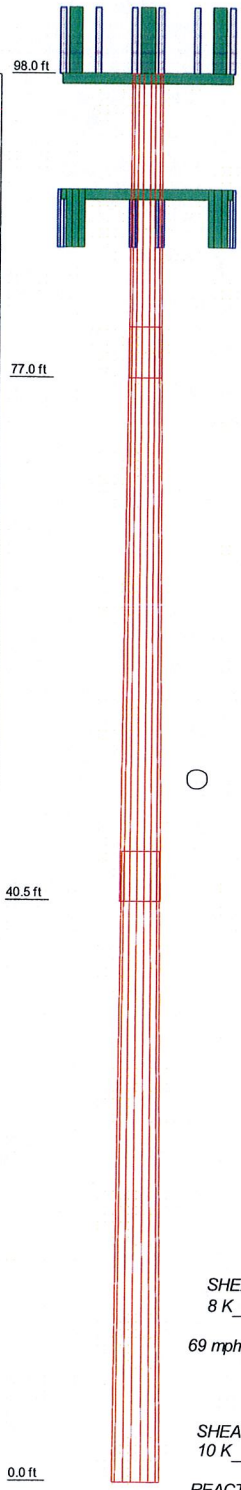
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	98 - 77	Pole	TP28.371x25.44x0.1875	1	-4.36	659.12	21.3	Pass	
L2	77 - 40.5	Pole	TP33.466x27.5075x0.25	2	-8.18	1037.47	49.6	Pass	
L3	40.5 - 0	Pole	TP39.12x32.4446x0.3125	3	-14.56	1539.31	62.0	Pass	
							Summary		
							Pole (L3)	62.0	Pass
							RATING =	62.0	Pass

APPENDIX C

Tower Elevation Drawing

Section	1	2	3
Length (ft)	21.00	40.00	44.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.2500	0.3125
Lap Splice (ft)	3.50	3.50	3.50
Top Dia (in)	25.4400	27.5075	32.4446
Bot Dia (in)	28.3710	33.4660	39.1200
Grade		A572-50	
Weight (K)	1.1	3.3	5.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Valmont 13' Platform w/o rails (GPD) (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-80063/4CF (VERIZON)	90
(3) 7770.00 (ATT)	98	(2) LPA-185063/8CFx2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFx2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFx2 (VERIZON)	90
(2) LGP21401 (ATT)	98	(2) LPA-185063/8CFx2 (VERIZON)	90
PIROD 13' Low Profile Platform (VERIZON)	90		

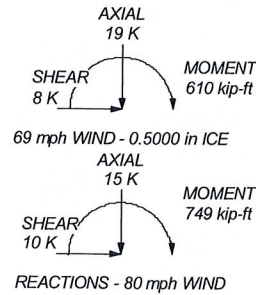
MATERIAL STRENGTH


GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 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 60 mph wind.
5. TOWER RATING: 62%

○



 GPD Group Consulting Engineers 520 South Main Street, Suite 2531 Akron, OH 44311 Phone: 330.572.2100 FAX: 330.572.2103	Job: 4539 EAST HARTFORD HOCHANUM
	Project: 2008263.92
	Client: AT&T MOBILITY Drawn by: M. Moellendick App'd:
	Code: TIA/EIA-222-F Date: 09/04/08 Scale: NTS
	Path: G:\Telecom\2008263\92\usa\4539EHartford.et Dwg No. E-1

APPENDIX D

Anchor Rod & Base Plate Analysis

Anchor Rod and Base Plate Stresses

4539 EAST HARTFORD HOCHANUM

Overturning Moment =	749.00	k*ft
Axial Force =	15.00	k
Shear Force =	10.00	k

Anchor Rods		
Pole Diameter =	39.12	in
Number of Rods =	8	
Rod Grade (Fy) =	75	ksi
Rod Circle =	44.878	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
0 Degrees		
Max Tension on Rod =	68.93	kips
Max Compression on Rod =	72.68	kips
45 Degrees		
Max Tension on Rod =	98.26	kips
Max Compression on Rod =	102.01	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	50.4%	OK

Base Plate		
Plate Strength (Fy) =	50	ksi
Plate Thickness =	2.75	in
Plate Width =	44	in
Est. Dist. b/w Rods =	6	in
w _{calc} =	13.02	in
e =	1.7542	in
w _{max} =	23.105	in
w =	13.02	in
S =	16.41	in ³
fb =	21.81	ksi
Fb =	50	ksi
Base Plate Capacity =	43.6%	OK