STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
www.ct.gov/csc

April 20, 2005

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

RE: **EM-VER-040-050328** -Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Newgate Road, East Granby, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on April 19, 2005, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated March 28, 2005, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: The Honorable David K. Kilbon, First Selectman, Town of East Granby
Lincoln B. White, Zoning Enforcement Officer, Town of East Granby
Stephen E. Korta II, Commissioner, Department of Transportation

ROBINSON & COLE LLP

KENNETH C. BALDWIN

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kbaldwin@rc.com
Direct (860) 275-8345

EM-VER-040-050328

March 28, 2005

Via Hand Delivery

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

Re: **Notice of Exempt Modification – Antenna Swap**
Newgate Road
East Granby, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains a wireless telecommunications facility on an existing tower owned by the Connecticut Department of Transportation off Newgate Road in East Granby. This facility consists of three (3) Metawave panel-type cellular antennas at the 75-foot level of the tower. Equipment associated with the antennas is located in a shelter near the base of the tower.

The Connecticut Siting Council ("the Council") approved Cellco's shared use of the Newgate Road facility on October 20, 1994. Cellco now intends to modify its facility by removing all three (3) Metawave antennas and installing six (6) new cellular antennas and six (6) PCS antennas at the same level on the tower. Attached behind Tab 1 are specifications for the existing Metawave antennas and the proposed cellular and PCS antennas for the Newgate Road facility.

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 East Granby First Selectman, David K. Kilbon.

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

1. The proposed modifications will not result in any increase in the overall height of the existing structure. Cellco's replacement antennas will be mounted at the same level on the tower.

2. The proposed modifications will not affect ground-mounted equipment and will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The proposed modifications will not result in radio frequency (RF) power density levels at the facility that exceed the Federal Communications Commission (FCC) adopted safety standard. Attached behind Tab 2 is a new General Power Density Calculation Table.

Also, attached behind Tab 3 is a structural analysis stating that the tower can support the proposed antenna modifications.

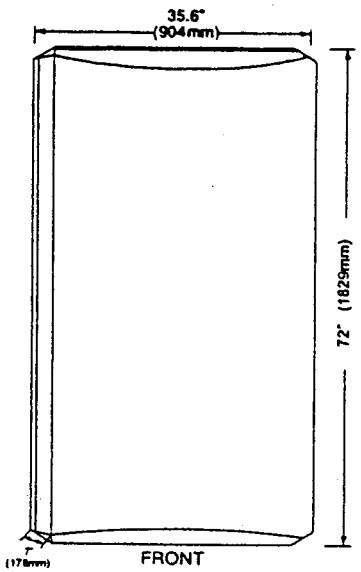
For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

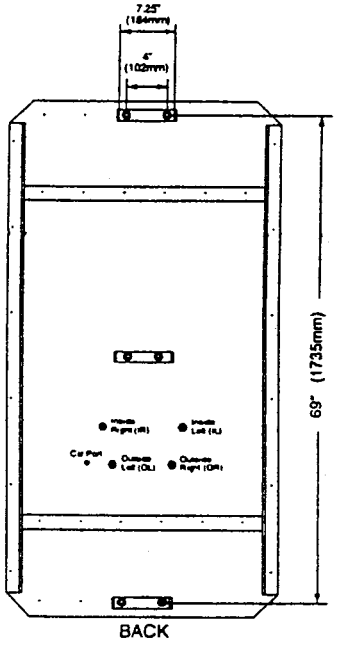
Sincerely,

Kenneth C. Baldwin

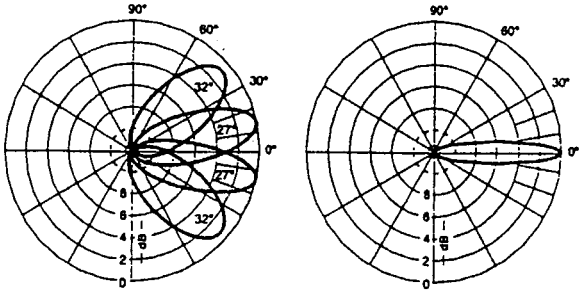
Enclosures
cc: David K. Kilbon, First Selectman
Sandy M. Carter

Part Number	155-0007-02
Terminations	Antenna Ports: 7/16 DIN Calibration Port: Type N-Female
Frequency Range	824-896 MHz
Gain	Outer Beams: 15.9 dBd (18.0 dBi) Inner Beams: 16.9 dBd (19.0 dBi)
VSWR	Input Ports: 1.5 : 1 Calibration Port: 1.8 : 1
Beamwidth (± 3°) (3dB from max)	Horizontal: 2 outer beams 32° ± 3°, 2 inner beams 27° ± 3° Vertical: 11° ± 2°
Azimuth Pointing Angle (± 2°)	2 Outer Beams: ± 45° 2 Inner Beams: ± 15°
Side Lobe Level	Inside: ≥ 10.25 dBc, down from main beam Outside: ≥ 8.25 dBc, down from main beam
Front-to-Back Ratio	25 dB
Polarization	Vertical
Max. Input Power	250 Watts, per beam 500 Watts, composite
Weight	75 lb (34 kg)
Wind Area	17.8 ft² (1.65 m²)
Wind Load	712 lbf (3167N) 320 kp (at 100 mph)
Max. Wind Speed	125 mph (201 km/h)
Material	~~Reflector: Pass. Aluminum~~ Radiators: Silver-Plated Brass Radome: ABS, UV Resistant Mounting Hdw: Galvanized Steel
Color, Radome	Gray
Mounting	DB380 pipe mount kit (max. 3.5" OD), included
Downtilt Bracket	Optional
Weather Protection	Fully protected by backplate and radome
Lightning Protection	All metal parts grounded
Packing Size	74" x 41" x 10" (188 x 104 x 25.4 cm)
Shipping Weight	131 lbs (59.4 kg)





ANTENNA PATTERNS



In CDMA systems, SpotLight 2000 combines beams to create custom sector patterns. You can use SpotLight's Beam Controller software to define, model and display CDMA sectors.

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DECIBEL
Base Station Antennas

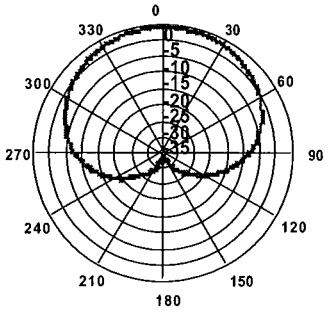
DB844F90A-SX

12 dBd, Directed Dipole Antenna
806-896 MHz

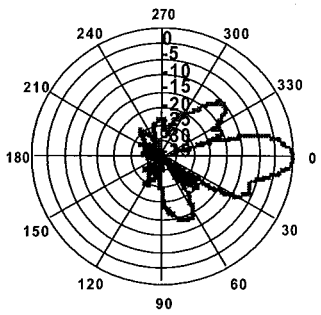
806-896 MHz

90°

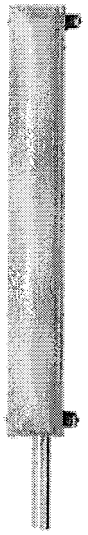
- Exceptional azimuth roll off reducing soft hand offs and improving capacity
- Strong null filling for below horizon RF penetration
- Extremely rugged, reliable design yet lightweight for low tower loading
- Air dielectric feed system



Horizontal 850 MHz (Tilt=0)



Vertical 850 MHz (Tilt=0)



ELECTRICAL		MECHANICAL	
Frequency (MHz):	806-896	**Weight:**	9.5 lbs (4.3 kg)
Polarization:	Vertical	**Dimensions (LxWxD):**	48 X 6.5 X 8 in (1219 X 165 X 203 mm)
Gain (dBd/dBi):	12/14.1	**Max. Wind Area:**	1.29 ft² (0.12 m²)
Azimuth BW:	90°	**Max. Wind Load (@ 100mph):**	69 lbf (307 N)
Elevation BW:	15°	**Max. Wind Speed:**	125 mph (201 km/h)
Beam Tilt:	0°	**Radiator Material:**	Aluminum
Front-to-Back Ratio* (dB):	40	**Reflector Material:**	Aluminum
VSWR:	1.33:1	**Radome Material:**	ABS,UV Resistant
Impedance:	50 Ohms	**Mounting Hardware Material:**	Galvanized Steel
Max Input Power:	500 Watts	**Connector Type:**	7-16 DIN - Female (Back)
Lightning Protection:	DC Ground	**Color:**	LightGray
		Standard Mounting Hardware:	DB380 Pipe Mount Kit, included
		Downtilt Mounting Hardware:	DB5083, optional
		Opt. Mounting Hardware:	DB5084-AZ

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8635 Stemmons Freeway
Dallas, Texas U.S.A 75247-3701
Tel: 214.631.0310

Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

dbtech@andrew.com

Date: 4/23/2004
* - Indicates Typical Values

DECIBEL
Base Station Antennas

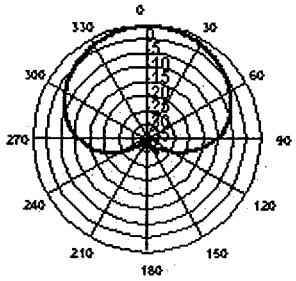
948F85T2E-M

16.1 dBi, Directed Dipole Antenna
1850-1990 MHz

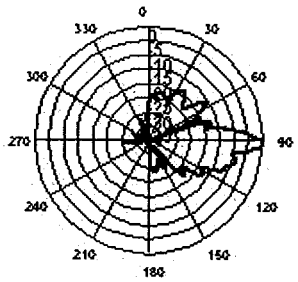
1850-1990 MHz
MaxFill™
dB Director®

- Exceptional azimuth roll-off reducing soft hand-offs and improving capacity
- Excellent upper side lobe suppression
- Deep null filling below the horizon assures improved signal intensity
- Low profile appearance and low wind loading profile for easier zoning approvals

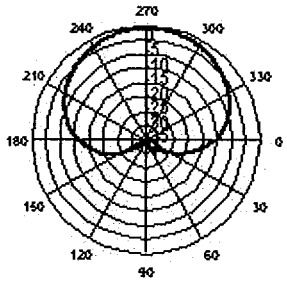
85°



Azimuth 1850 MHz (Tilt=2)



Vertical 1850 MHz (Tilt=2)



Horizontal 1850 MHz (Tilt=2)

ELECTRICAL		MECHANICAL	
Frequency (MHz):	1850-1990	**Weight:**	8.5 lbs (3.9 kg)
Polarization:	Vertical	**Dimensions (LxWxD):**	48 X 3.5 X 7 in (1219 X 89 X 178 mm)
Gain (dBd/dBi):	14/16.1	**Max. Wind Area:**	1.18 ft² (0.11 m²)
Azimuth BW:	85°	**Max. Wind Load (@ 100mph):**	65 lbf (289 N)
Elevation BW:	8°	**Max. Wind Speed:**	125 mph (201 km/h)
Beam Tilt:	2°	**Radiator Material:**	Low Loss Circuit Board
USLS* (dB):	>18	**Reflector Material:**	Aluminum
Null Fill* (dB):	15	**Radome Material:**	ABS, UV Resistant
Front-to-Back Ratio* (dB):	40	**Mounting Hardware Material:**	Galvanized Steel
VSWR:	<1.33:1	**Connector Type:**	7-16 DIN - Female (Bottom)
IM Suppression - Two 20 Watt Carriers:	-150 dBc	**Color:**	Light Gray
Impedance:	50 Ohms	**Standard Mounting Hardware:**	DB390 Pipe Mount Kit, included
Max Input Power:	250 Watts	**Downtilt Mounting Hardware:**	DB5098, optional
Lightning Protection:	DC Ground	**Opt. Mounting Hardware:**	DB5094-AZ Azimuth Wall Mount
Opt Electrical Tilt:	0°,4°,6°		

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Fax: 1.800.229.4706
www.andrew.com

dbtech@andrew.com

Date: 4/29/2004
* - Indicates Typical Values

General Power Density

Site Name: East Granby , CT
Tower Height: 75 ft rad center

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
Verizon	869	9	200	1800	75	0.1151	0.5793	19.87%
Verizon	1900	3	200	600	75	0.0384	1	3.84%
Total Percentage of Maximum Permissible Exposure								23.70%

*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
t

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

Absolute worst case scenario, maximum values used.

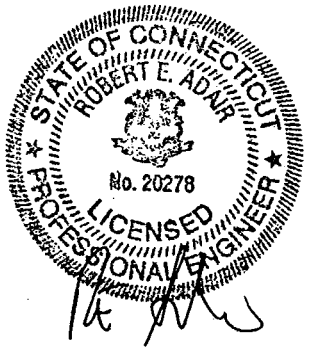
ALL-POINTS TECHNOLOGY CORPORATION, P.C.

STRUCTURAL ANALYSIS REPORT
75' MONOPOLE TOWER
EAST GRANBY, CONNECTICUT

Prepared for
Verizon Wireless

Verizon Site: East Granby

March 7, 2005



APT Project #CT141570

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☒ 150 OLD WESTSIDE ROAD • NORTH CONWAY, NEW HAMPSHIRE 03860 • PHONE/FAX: 603-356-5214

STRUCTURAL ANALYSIS REPORT
75' MONOPOLE TOWER
EAST GRANBY, CONNECTICUT
prepared for
Verizon Wireless

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of this 75-foot monopole tower located in East Granby, Connecticut. The analysis was performed for antenna changes proposed by Verizon Wireless.

Our analysis indicates the tower is capable of supporting the proposed antennas. The existing foundation could not be evaluated, as information on its design or construction was not available to APT. However, the proposed antenna changes result in significantly reduced tower loading. Total wind area of the proposed antenna configuration is approximately 58 percent of the area of the existing Metawave panel antennas.

INTRODUCTION:

A structural analysis of this communications tower was performed by APT for Verizon Wireless. The tower is located off Newgate Road in East Granby, Connecticut.

APT did not visit the tower site. This analysis relied on information provided by Verizon Wireless, which included a structural analysis report by L&W Engineering dated June 25, 2001, and existing and proposed antenna specifications.

The structure is a 75-foot galvanized steel, 18-sided tapered monopole manufactured by Summit Manufacturing, Inc. The analysis was conducted for the following antenna inventory (proposed antenna changes shown in **bold** text):

Antenna	Elev.	Mount	Coax.
Ground rod	75'	Banded to pole	N.A.
Beacon	75'	Top plate	7/8"
(6) DB844F90A-SX; (6) DB948F85T2E-M[1]	75'	14' platform	(12) 1-5/8"

[1] Proposed antennas to replace existing three Metawave 155-0007-02 panels.

STRUCTURAL ANALYSIS:

Methodology:

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

The analysis was conducted using a wind speed of 85 miles per hour and one-half inch of radial ice over the entire structure and all appurtenances. The TIA/EIA Standard requires a minimum of 80-mph wind load for Hartford County, Connecticut.

A finite element analysis using ERI Tower© software was used to calculate loads of the tower and all appurtenances, radial ice loads, and the resultant wind loading. The calculated bending moments and axial loads were used to determine combined axial and bending stresses on each section of the monopole, which were compared to allowable stresses according to AISC and TIA/EIA.

EIA requires two loading conditions to be evaluated to determine the tower's capacity. The higher stresses resulting from the two cases is used to calculate the tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load (controls)
- Case 2 = **0.75** Wind Load (with ice) + Ice Load + Tower Dead Load

EIA permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third in computing the load capacity values indicated herein.

ANALYSIS RESULTS:

Our analysis determined the tower will support the proposed antenna array. The following table summarizes the capacity of the tower based on combined axial and bending stresses:

Elevation	Capacity
50'-75'	33%
24'-50'	41%
0'-24'	52%

The capability of the existing foundation to support the proposed antenna changes could not be evaluated, as information on its design or construction was not available to APT. However,

considering the significant tower capacity remaining, the foundation is likely to be adequately sized.

Additionally, the proposed antenna changes result in significantly reduced tower loading. Total wind area of the proposed antenna configuration is approximately 58 percent of the area of the existing Metawave panel antennas.

Base reactions imposed with the proposed antennas were calculated to be as follows:

Compression:	6.5 kips
Total Shear:	2.9 kips
Overturning Moment:	163.1 ft-kips

CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the existing 75' Summit monopole tower in East Granby, Connecticut is capable of supporting Verizon Wireless' proposed antenna changes.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in new condition.
3. All bolts are in place and are properly tightened.
4. Tower is in plumb condition.

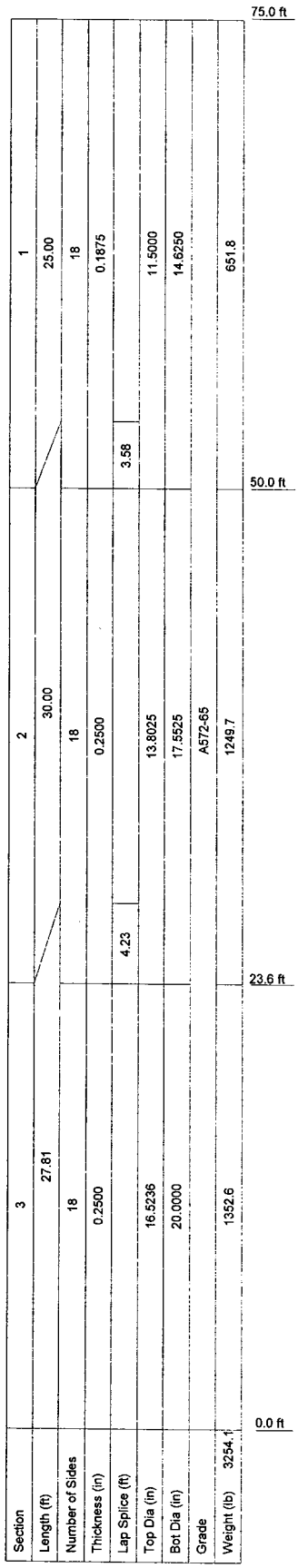
All-Points Technology Corporation, P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

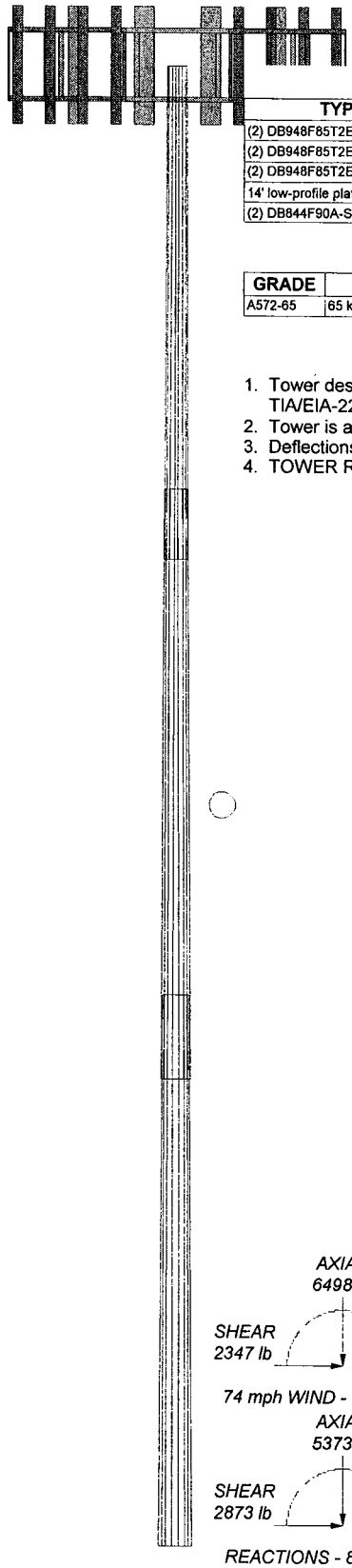
1. Adding or relocating antennas.
2. Installing antenna mounting gates or side arms.
3. Extending tower.

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

Appendix A

Tower Schematic





APPURTENANCES

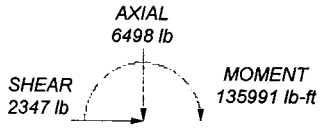
TYPE	ELEVATION	TYPE	ELEVATION
(2) DB948F85T2E-M	75	(2) DB844F90A-SX	75
(2) DB948F85T2E-M	75	(2) DB844F90A-SX	75
(2) DB948F85T2E-M	75	Flash Beacon Lighting	75
14' low-profile platform	75	Generic Lightning Rod 4' copper	75
(2) DB844F90A-SX	75		

MATERIAL STRENGTH

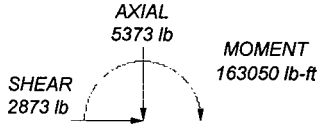
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 52.3%



74 mph WIND - 0.5000 in ICE



REACTIONS - 85 mph WIND

All-Points Technology Corp.
150 Old Westside Road
North Conway, NH 03860
Phone: 603-496-5853
FAX: 603-356-5214

Job: ***75' Summit Monopole***		
Project: ***CT141570 East Granby***		
Client: Verizon Wireless	Drawn by: REA	App'd:
Code: TIA/EIA-222-F	Date: 03/04/05	Scale: NTS
Path: C:\My Documents\Jobs\CT141570 East Granby\CT141570 East Granby.eri		Dwg No. E-1

Appendix B

Calculations

Tower Input Data

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

Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Deflections calculated using a wind speed of 50 mph.
User specified elevation for calculation of G_h is 75.00 ft.
A non-linear (P-delta) analysis was used.
Stress ratio used in pole design is 1.333.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	75.00-50.00	25.00	3.58	18	11.5000	14.6250	0.1875	0.7500	A572-65 (65 ksi)
L2	50.00-23.58	30.00	4.23	18	13.8025	17.5525	0.2500	1.0000	A572-65 (65 ksi)
L3	23.58-0.00	27.81		18	16.5236	20.0000	0.2500	1.0000	A572-65 (65 ksi)

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	11.6774	6.7324	108.8482	4.0159	5.8420	18.6320	217.8397	3.3668	1.6940	9.035
	14.8506	8.5921	226.2672	5.1253	7.4295	30.4552	452.8322	4.2969	2.2440	11.968
L2	14.4698	10.7539	249.5414	4.8111	7.0117	35.5894	499.4112	5.3780	1.9892	7.957
	17.8233	13.7295	519.2912	6.1424	8.9167	58.2382	1039.2657	6.8661	2.6492	10.597
L3	17.3156	12.9131	432.0503	5.7771	8.3940	51.4714	864.6691	6.4578	2.4682	9.873
	20.3085	15.6716	772.2994	7.0112	10.1600	76.0137	1545.6150	7.8373	3.0800	12.32

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8	C	No	Inside Pole	75.00 - 6.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft^2	ft^2	lb
(2) DB948F85T2E-M	A	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
(2) DB948F85T2E-M	B	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
(2) DB948F85T2E-M	C	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
14' low-profile platform	A	None		0.0000	75.00	No Ice 1/2" Ice	10.75 11.59	10.75 11.59	1100.00 1179.27
(2) DB844F90A-SX	A	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
(2) DB844F90A-SX	B	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
(2) DB844F90A-SX	C	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
Flash Beacon Lighting	A	None		0.0000	75.00	No Ice 1/2" Ice	2.70 3.10	2.70 3.10	50.00 70.00
Generic Lightning Rod 4' copper	C	None		0.0000	75.00	No Ice 1/2" Ice	0.50 1.00	0.50 1.00	0.00 0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 90 deg - No Ice
4	Dead+Ice+Temp
5	Dead+Wind 0 deg+Ice+Temp
6	Dead+Wind 90 deg+Ice+Temp
7	Dead+Wind 0 deg - Service
8	Dead+Wind 90 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	4	6498.24	0.00	0.00
	Max. H_x	7	5373.18	0.00	1063.41
	Max. H_z	2	5373.16	0.00	2873.18
	Max. M_x	2	163050.33	0.00	2873.18
	Max. M_z	3	163050.33	-2873.18	0.00
	Max. Torsion	1	0.00	0.00	0.00
	Min. Vert	3	5373.16	-2873.18	0.00

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_x	3	5373.16	-2873.18	0.00
	Min. H_z	1	5373.18	0.00	0.00
	Min. M_x	1	0.00	0.00	0.00
	Min. M_z	1	0.00	0.00	0.00
	Min. Torsion	3	0.00	-2873.18	0.00

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	5373.18	0.00	0.00	0.00	0.00	0.00
Dead+Wind 0 deg - No Ice	5373.16	0.00	-2873.18	-163050.33	0.00	0.00
Dead+Wind 90 deg - No Ice	5373.16	2873.18	0.00	0.00	-163050.33	0.00
Dead+Ice+Temp	6498.24	0.00	0.00	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp	6498.22	0.00	-2347.28	-135991.25	0.00	0.00
Dead+Wind 90 deg+Ice+Temp	6498.22	2347.28	0.00	0.00	-135991.25	0.00
Dead+Wind 0 deg - Service	5373.18	0.00	-1063.41	-60914.18	0.00	0.00
Dead+Wind 90 deg - Service	5373.18	1063.41	0.00	0.00	-60914.18	0.00

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	75 - 50	30.773	2	3.3596	0.0000
L2	53.58 - 23.58	16.713	2	2.7404	0.0000
L3	27.8113 - 0	4.836	2	1.5457	0.0000

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	75 - 50 (1)	TP14.625x11.5x0.1875	25.00	75.00	181.2	4.547	8.3258	-1986.20	37860.30	0.052
L2	50 - 23.58 (2)	TP17.5525x13.8025x0.25	30.00	75.00	151.1	6.537	13.3098	-3489.95	87005.70	0.040
L3	23.58 - 0 (3)	TP20x16.5236x0.25	27.81	75.00	128.4	9.063	15.6716	-5371.29	142027.00	0.038

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	75 - 50 (1)	TP14.625x11.5x0.1875	0.052	0.382	0.000	0.434 ✔	1.333	H1-3 ✔
L2	50 - 23.58 (2)	TP17.5525x13.8025x0.25	0.040	0.507	0.000	0.547 ✔	1.333	H1-3 ✔
L3	23.58 - 0 (3)	TP20x16.5236x0.25	0.038	0.660	0.000	0.698 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	75 - 50	Pole	TP14.625x11.5x0.1875	1	-1986.20	50467.78	32.6	Pass
L2	50 - 23.58	Pole	TP17.5525x13.8025x0.25	2	-3489.95	115978.60	41.0	Pass
L3	23.58 - 0	Pole	TP20x16.5236x0.25	3	-5371.29	189321.98	52.3	Pass
							Summary	
						Pole (L3)	52.3	Pass
						Base Plate	50.1	Pass
						RATING =	**52.3**	**Pass**