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
Web Site: www.state.ct.us/csc/index.htm

March 12, 2003

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

RE: **EM-VER-077-030225** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 266 Center Street, Manchester, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on March 11, 2003, 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 February 25, 2003. 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
Chairman

PBK/laf

c: Honorable Stephen T. Cassano, Mayor, Town of Manchester
Steven R. Werbner, General Manager, Town of Manchester
Thomas R. O'Marra, Zoning Enforcement Officer, Town of Manchester
Robert Stanford, Crown Atlantic Company, LLC

ROBINSON & COLE

EM-VER-077-030225

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
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February 25, 2003

Via Hand Delivery

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

Re: Notice of Exempt Modification
Crown Atlantic Company, LLC Tower
266 Center Street
Manchester, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to modify its existing antenna configuration on the Crown Atlantic Company, LLC ("Crown") tower at 266 Center Street in Manchester, Connecticut. Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for activity 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 the Manchester General Manager, Steven R. Werbner.

This tower is owned and operated by Crown and was approved by the Siting Council (the "Council") in Docket No. 129. Cellco's existing facility consists of fifteen (15) antennas attached to the tower at the 113-foot level and a single-story equipment shelter near the base of the tower. To improve system performance, Cellco now intends to replace the fifteen (15) antennas with twelve (12) antennas at the same 113-foot level on the tower. Eight of the twelve will be Antel RWB-80015/90LS antennas and the remaining four will be Antel RWA-80017LS antennas (see attached specifications). There are no changes proposed to any ground mounted structures or equipment.

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's replacement antennas will be mounted at the 113-foot level on the 115-foot tower.

2. The modifications to Cellco's antenna configuration does not effect any ground level equipment or structure and therefore will not require an extension of facility boundaries.

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

4. The operation of the replacement antennas will not change radio frequency (RF) power density levels at the facility. Updated power density calculations are therefore not provided.

Also attached is the engineer's certification that the tower can support Cellco's proposed modifications. Please note that the full structural report, prepared by All-Points Technology, dated January 24, 2003 depicts the installation of twelve (12) DB844H80 panel antennas. Following the issuance of the report, Cellco decided that it would install eight (8) Antel RWB-80015/90LS and four (4) Antel RWA-80017LS antennas on the tower, in lieu of the DB844H80 antennas. A subsequent structural letter, prepared by All-Points Technology, dated February 3, 2003 is attached and verifies that the tower is capable of supporting the Antel antennas. Also attached are antenna specifications for the Antel antennas.

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

Sincerely,

Kenneth C. Baldwin

KCB:cag

cc: Steven R. Werbner, Manchester General Manager
Sandy M. Carter

ALL-POINTS TECHNOLOGY CORPORATION, P.C.

STRUCTURAL ANALYSIS REPORT
115' MONOPOLE TOWER
MANCHESTER, CONNECTICUT

Prepared for
Verizon Wireless

Verizon Site: Manchester

January 24, 2003

APT Project #CT141230

☐ 711 NORTH MOUNTAIN ROAD • NEWINGTON, CONNECTICUT 06111 • PHONE: 860-953-4444 • FAX: 860-953-1181
☒ 150 OLD WESTSIDE ROAD • NORTH CONWAY, NEW HAMPSHIRE 03860 • PHONE/FAX: 603-356-5214

STRUCTURAL ANALYSIS REPORT
115' MONOPOLE TOWER
MANCHESTER, CONNECTICUT
prepared for
Verizon Wireless

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of this 115-foot monopole tower located in Manchester, Connecticut. The analysis was performed for Verizon Wireless' proposed replacement of their existing fifteen ALP7130.16 panel antennas with twelve DB844 panel antennas on the existing platform at 113'. Waveguide cables are to be twelve 1-5/8" cables.

Our analysis indicates the tower is capable of supporting the proposed antennas.

INTRODUCTION:

A structural analysis of this communications tower was performed by All-Points Technology Corporation, P.C. (APT) for Verizon Wireless. The tower is located off Route 6 in Manchester, Connecticut.

APT visited the tower site on January 15, 2003. Robert E. Adair, P.E. climbed the tower in its entirety to compile data necessary to perform the structural analysis. The analysis also used Valmont design drawings provided by Crown Castle Atlantic.

The structure is a 115-foot galvanized steel, three section monopole manufactured by Valmont Industries. The analysis was conducted using the following antenna inventory:

Antenna	Elev.	Mount	Coax.
(12) DB844H80 panels	113'	14' platform w/rails	(12) 1-5/8"
None	100'	14' low-profile platform	N.A.

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 80 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.

Two analytical methods were used to evaluate the structure: a two-dimensional linear computer model developed by APT, and a P-delta analysis using CSTRAAD finite element software distributed by Digital Canal Software. The 2-D model was used to generate dead loads of the tower and all of its appurtenances, radial ice loads and the resultant wind loading. The maximum bending moments and axial loads were used to calculate combined axial and bending stresses on each section of the monopole, which were compared to allowable stresses according to AISC and TIA/EIA.

Loads generated in the 2-D model were input into the CSTRAAD program to evaluate secondary bending moments induced during deflection of the structure under load and to independently evaluate stresses. Evaluation of secondary bending moments is required by EIA paragraph 3.1.15. Our analysis indicates that the secondary moments exceed those of the linear analysis, and therefore govern in determining the capacity of the structure.

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
0'-30'	**38%**
30'-72'	**32%**
72'-115'	**23%**

The capability of the existing foundation to support the proposed load was evaluated by comparing design reactions with those imposed by the proposed loading. We calculated reactions to be less than design reactions, indicating the existing foundation is adequate to support the proposed loads, provided it was designed and constructed to support original design reactions.

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

Compression:	19.8 kips
Total Shear:	13.3 kips
Overturning Moment:	905 ft-kips

CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the existing 115' Valmont monopole tower and foundation in Manchester, Connecticut are 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.
5. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

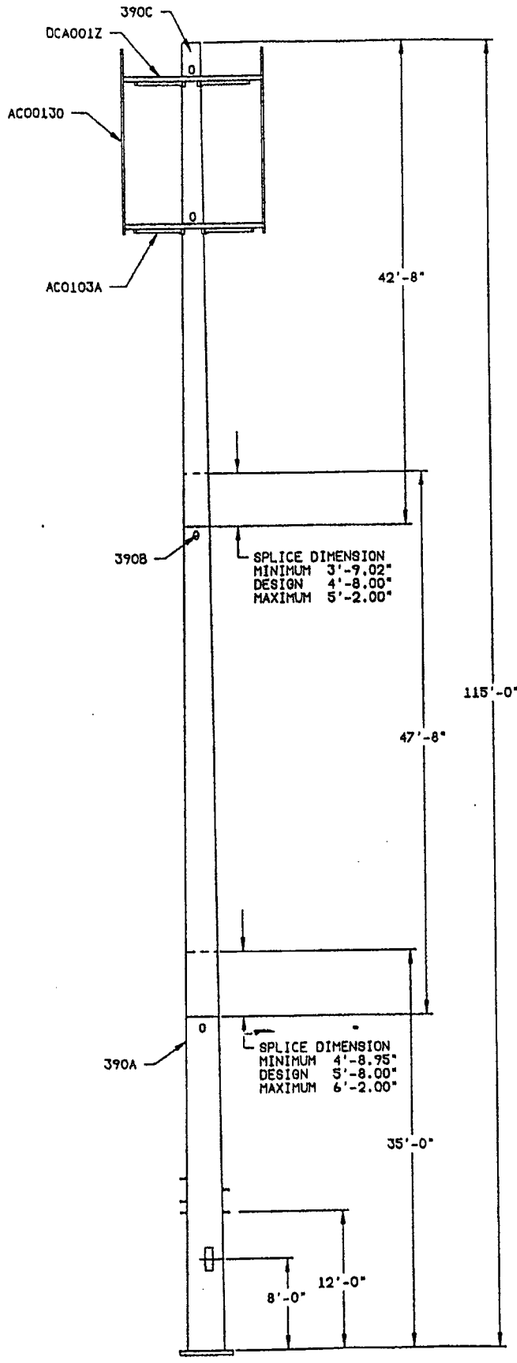
All-Points Technology Corporation, P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

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

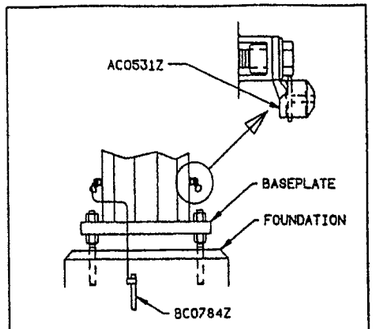
APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth

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.

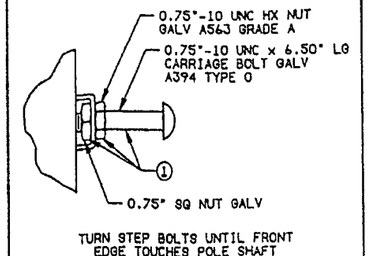
A0



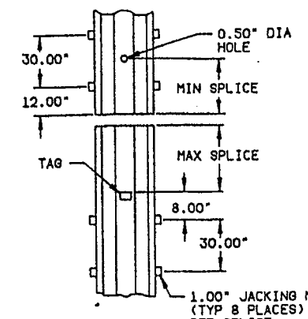
ERECTION DRAWING
SEE FABRICATION DRAWINGS FOR ADDITIONAL DETAILS



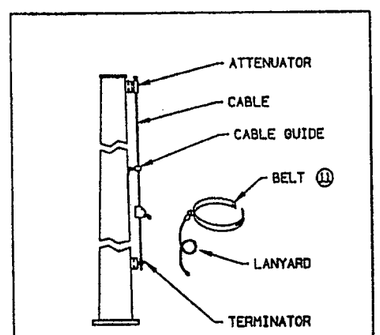
BASEPLATE CONNECTION



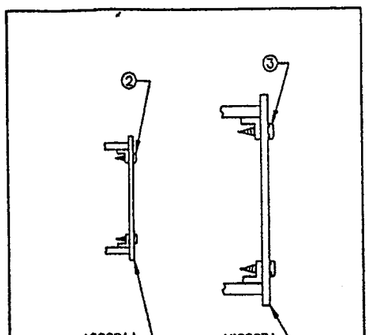
STEP KIT



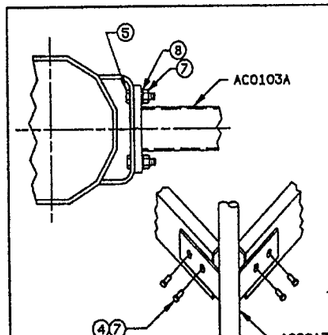
SPLICE CONNECTION



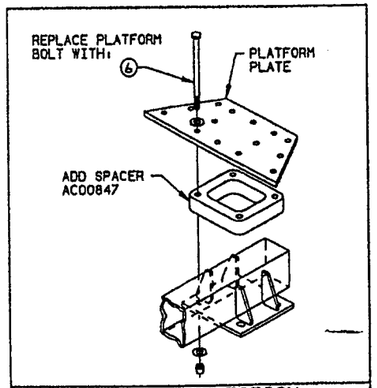
SAFETY CLIMBING ASSEMBLY



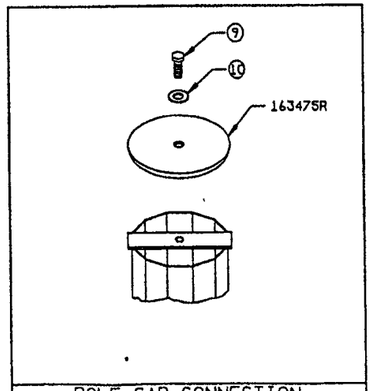
HANDHOLE COVERS



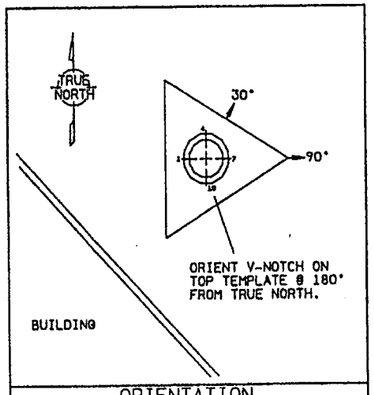
TYPICAL ARM CONNECTIONS



PLATFORM CONNECTION



POLE CAP CONNECTION



ORIENTATION

NOTES:

1. POLE SHAFT-GOVERNING REACTIONS
   MOMENT - 28,352 IN-KIPS
   SHEAR - 27,932 #
   VERTICAL - 23,750 #
2. COMPONENT IDENTIFICATION: TAG LOCATIONS ARE INDICATED BY CALLOUTS ON DRAWING. "TAG MARK" IN BILL OF MATERIAL SHOWS FIRST 4 DIGITS ON EACH TAG. SUBSEQUENT DIGITS WILL INDICATE SEQUENCE OF MANUFACTURER.
3. ASSEMBLY AND ERECTION GUIDELINES: SEE VALMONT TRANSMISSION INSTALLATION GUIDELINE I012.
4. SLIP JOINT JACKING FORCE
   MINIMUM-25000#
   MAXIMUM-90000#
5. WEIGHT: WEIGHT IN TITLE BLOCK IS TOTAL STRUCTURE WEIGHT EXCLUDING ANCHORAGE.
6. FINISH: GALVANIZED PER ASTM A-123.
7. SITE: MANCHESTER, CT
8. POLE DESIGNED FOR:
   A. EIA-222-D, 90 MPH, 1/2" ICE.
   B. 1-PLATFORM @ 112' ELEV.
   C. 4-PD10017'S ON TOP PLATFORM.
   D. 12-PD1132'S BETWEEN PLATFORMS, 6-WITH DOWN-TILTS.
   E. 1-PLATFORM @ 99' ELEV.

BILL OF MATERIAL
(SHIPPING SEQ.-1 FOR ALL)

VALMONT PART NUMBER PREFIX	TAG MARK	DESCRIPTION	UNIT WEIGHT (LBS)	QTY PER STR
DCO	390A	SECTION ASSEMBLY	7,825	1
DCO	3908	SECTION ASSEMBLY	5,700	1
DCO	390C	SECTION ASSEMBLY	2,800	1
CCO	0290	CAGE ASSEMBLY	2,040	1
ACO	0130	CORNER POST	57	3
ACO	103A	PLATFORM ARM	85	6
ACO	0847	SPACER PLATE	18	6
---	NOTE	DOUBLE PLATFORM (DCA001Z)	2,186	1
---	NOTE	E.I.A. GROUNDING (BCA784Z)	20	1
---	NOTE	GROUND LUG KIT (AC0531Z)	1	2
---	NOTE	SAFETY CLIMBING ASSY (BCA120Z)	44	1

MISCELLANEOUS

AC0096A	HANDHOLE COVER (5 X 8)	3	8
AC0097A	HANDHOLE COVER (9 X 24)	9	1
163475R	POLE CAP (23" DIA)	30	1

ITEM NO.	VALMONT PART NUMBER	DESCRIPTION: HARDWARE SIZE (IN) BOLT DIA	BOLT LONG	NUT	WSHR	GENERAL	FINISH	ASTM SPEC	QTY PER STR
1	2136A					STEP KIT	HDGV	-	86
2	164035	0.25	0.75			SCREW	S.S.	A410	18
3	161647	0.38	1.00			SCREW	S.S.	A410	4
4	161147	0.63	1.50				HDGV	A325 •	26
5	161170	0.63	2.50				HDGV	A325 •	26
6	161678	0.63	8.00				HDGV	A325 •	26
7	333014			0.63		LOCK	HDGV	A563	52
8	142070				0.63	FLAT	HDGV	F436	26
9	161171	0.75	1.75				HDGV	A325 •	1
10	142056				0.75	FLAT	HDGV	F436	1
11	ABLBELT					SAFTYBELT	-	-	1

• EXCEPT 96.2 & 8.5

SHAFT INFO

SEC	LENGTH	BASE OD	TOP OD	THK	MAT
A	35'-00"	43.85"	36.85"	0.375"	8-22
B	47'-08"	38.61"	29.07"	0.313"	8-22
C	42'-08"	30.45"	21.91"	0.219"	8-22

DCO3902

DUPLICATE DRAWING DISTRIBUTION

"S"PED10665MEIRO MOBILE-CT 115' CELLULAR

DWG SIZE D | CLASS CODE (1) 1 | CLASS NO. (2) 450

REV BY	DATE	CHK BY	REVISION DESCRIPTION

MATERIAL | THICKNESS | STOCK SPECIFICATIONS

WEIGHT 19,621# | SCALE NONE | E.A. DIM.

DATE 05-01-90 | DRAWN MAL | DESIGN | APPD. DIM.

VALMONT ORDER NO. 10665-90 | CUSTOMER METRO MOBILE-CT | DESCRIPTION 115' CELLULAR | DRAWING NUMBER DCO3902

VALMONT. VALMONT INDUSTRIES, INC. VALLEY, NEBRASKA 68064 (402) 359-2201

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

General Information

Tower Manufacturer		Valmont	
Tower Type		Monopole	
Total Height of Tower		115	ft.
Wind Speed	EIA Hartford Cty	80	mph.
Radial Ice		0.5	in.
25% Reduction for ice		yes	(yes or no)
1/3 increase for allowable loads		yes	(yes or no)
Number of faces		12	faces

Calculations based on EIA/TIA-222-F, using the following formulas:
Force on discrete appurtenance: F=Qz*Gh*Ca*A
Force on microwave antennae: F=Cr*A*Gh*Kz*V^2, where Cr=((Ca^2)+(Cs^2))^(1/2)
Gust response factor Gh= 1.69
V as specified EIA-222-F

E (Modulus of Elasticity)	29000	ksi
Fb	0.6	
K	1	
Min. Width =	21.91	in
Max. Width =	43.85	in
Slope of Tower =	0.0159	in/in

Tower Information

Section	Length (ft.)	Midpt Elev.	Base Width (in.)	Top Width (in.)	Area (sf) w/o Ice	Area (sf) w/ Ice	Wall Thknss	Wt. (lbs) Tower	Wt. (lbs) Ice
11	10.00	110.00	23.82	21.91	19.05	19.89	0.219	689.20	142.72
10	11.00	99.50	25.92	23.82	22.79	23.71	0.219	825.18	170.46
9	11.00	88.50	28.02	25.92	24.72	25.64	0.219	895.44	184.56
8	11.00	77.50	30.11	28.02	26.64	27.56	0.219	854.27	198.66
7	10.00	67.00	32.02	30.11	25.89	26.72	0.313	1183.41	192.84
6	10.00	57.00	33.93	32.02	27.48	28.31	0.313	1256.82	204.49
5	11.00	46.50	36.03	33.93	32.06	32.98	0.313	1467.30	238.40
4	11.00	35.50	38.13	36.03	33.99	34.90	0.313	1556.13	252.50
3	10.00	25.00	40.03	38.13	32.57	33.40	0.375	1784.37	241.78
2	10.00	15.00	41.94	40.03	34.16	34.99	0.375	1872.33	253.44
1	10.00	5.00	43.85	41.94	35.75	36.58	0.375	1960.28	265.09
	115.00						**Total**	**14345**	**2345**

All-Points Technology Corp., P.C.
150 Old Westside Road
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(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

Monopole Properties

Section	I in^4	Area in^2	Area mid	I mid	J mid	r in	S in^3	L / side in
Top	919.91	15.27						
11	1184.59	16.62	**15.9**	**1052**	**2104**	8.44	99.47	6.38
10	1529.54	18.10	**17.4**	**1357**	**2714**	9.19	118.04	6.94
9	1935.69	19.57	**18.8**	**1733**	**3465**	9.94	138.19	7.51
8	2408.04	21.05	**20.3**	**2172**	**4344**	10.70	159.93	8.07
7	4107.04	31.91	**26.5**	**3258**	**6515**	11.34	256.52	8.58
6	4893.82	33.83	**32.9**	**4500**	**9001**	12.03	288.47	9.09
5	5868.71	35.94	**34.9**	**5381**	**10763**	12.78	325.79	9.65
4	6965.17	38.06	**37.0**	**6417**	**12834**	13.53	365.37	10.22
3	9627.71	47.82	**42.9**	**8296**	**16593**	14.19	480.97	10.73
2	11084.96	50.12	**49.0**	**10356**	**20713**	14.87	528.58	11.24
1	12682.31	52.42	**51.3**	**11884**	**23767**	15.55	578.44	11.75

Tower Dead Load Summary

Elev.	Dead load Tower (lbs)	Dead load Ice (lbs)
94.0	1514	313
83.0	2410	498
72.0	3264	696
62.0	4447	889
52.0	5704	1094
41.0	7172	1332
30.0	8728	1585
20.0	10512	1826
10.0	12384	2080
0.0	14345	2345

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

Antenna Information

Wind Velocity= 80 mph
Tower Hgt= 115 ft.

ANTENNAS

Type	Elev. (z)	Coeff. (C)	Kz	Qz	Area (no ice)	Force (no ice)	Weight	El/Dist
(12) DB844 on 14' platform w/rails	113	1.4	1.42	23.29	41.9	**2310**	1400	11-8
14' LP platform	100	2.0	1.37	22.49	7.0	**532**	1000	10-6

LINEAR APPURTENANCES

Section	Area w/o Ice	Area w/ Ice	Weight w/o Ice	Weight w/ Ice
11	0.31	1.15	130	140
10	0.34	1.26	143	154
9	0.34	1.26	143	154
8	0.34	1.26	143	154
7	0.31	1.15	130	140
6	0.31	1.15	130	140
5	0.34	1.26	143	154
4	0.34	1.26	143	154
3	0.31	1.15	130	140
2	0.31	1.15	130	140
1	0.31	1.15	130	140

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

Wind Velocity = 80 mph
Height of Tower = 115 feet

Kz = Exposure coefficient = $(z/33)^{2/7}$; 1.00<=Kz<=2.58
Qz = Velocity pressure = .00256*Kz*V^2
Gh = Gust response factor = 1.69
Cf = Structure force coefficient from Table 1 of TIA/EIA
Force = Qz*Gh*(Cf*Ae+Ca*Aa)

Wind Load Without Ice

Section	Midpoint Height	Areas Ae	Areas Aa	Kz	Qz	Gh	Cf	Wind Load	Wind Load
11	110.00	19.1	0.31	1.41	23.11	1.69	1.03	**781 lbs.**	**78 plf.**
10	99.50	22.8	0.34	1.37	22.46	1.69	1.03	**907 lbs.**	**82 plf.**
9	88.50	24.7	0.34	1.33	21.72	1.69	1.03	**950 lbs.**	**86 plf.**
8	77.50	26.6	0.34	1.28	20.91	1.69	1.03	**984 lbs.**	**89 plf.**
7	67.00	25.9	0.31	1.22	20.06	1.69	1.03	**917 lbs.**	**92 plf.**
6	57.00	27.5	0.31	1.17	19.15	1.69	1.03	**928 lbs.**	**93 plf.**
5	46.50	32.1	0.34	1.10	18.07	1.69	1.03	**1021 lbs.**	**93 plf.**
4	35.50	34.0	0.34	1.02	16.73	1.69	1.03	**1001 lbs.**	**91 plf.**
3	25.00	32.6	0.31	1.00	16.38	1.69	1.03	**939 lbs.**	**94 plf.**
2	15.00	34.2	0.31	1.00	16.38	1.69	1.03	**985 lbs.**	**98 plf.**
1	5.00	35.7	0.31	1.00	16.38	1.69	1.03	**1030 lbs.**	**103 plf.**

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

Wind Load With Ice

Section	Midpoint Height	Areas Ae	Areas Ai	Kz	Qz	Gh	Cf	Wind Load	75% Wind Load
11	110.00	19.9	1.15	1.41	23.11	1.69	1.03	**854 lbs.**	**64 plf.**
10	99.50	23.7	1.26	1.37	22.46	1.69	1.03	**984 lbs.**	**67 plf.**
9	88.50	25.6	1.26	1.33	21.72	1.69	1.03	**1025 lbs.**	**70 plf.**
8	77.50	27.6	1.26	1.28	20.91	1.69	1.03	**1057 lbs.**	**72 plf.**
7	67.00	26.7	1.15	1.22	20.06	1.69	1.03	**980 lbs.**	**73 plf.**
6	57.00	28.3	1.15	1.17	19.15	1.69	1.03	**988 lbs.**	**74 plf.**
5	46.50	33.0	1.26	1.10	18.07	1.69	1.03	**1084 lbs.**	**74 plf.**
4	35.50	34.9	1.26	1.02	16.73	1.69	1.03	**1059 lbs.**	**72 plf.**
3	25.00	33.4	1.15	1.00	16.38	1.69	1.03	**991 lbs.**	**74 plf.**
2	15.00	35.0	1.15	1.00	16.38	1.69	1.03	**1036 lbs.**	**78 plf.**
1	5.00	36.6	1.15	1.00	16.38	1.69	1.03	**1081 lbs.**	**81 plf.**

Frame Static Analysis Report

Project::	CT141230 Manchester	Company:	All-Points Technology Corporation
Description:	115' Valmont Monopole	User:	Robert Adair, P.E.
Date:	01/21/2003 10:15 AM	Software:	Digital Canal Frame Analysis & Design

NODAL COORDINATES / BOUNDARY CONDITIONS (F=FIX, S=SUP, M=MASTER/SLAVE)

NODE NO	REBAND NO	X	Y	Z	NODE TEMP	ALPHA	BETA	GAMMA	DIR	DDDOOO XYZXYZ	STIFFNESS
Units:		Ft	Ft	Ft	F	Deg	Deg	Deg			K /In /Deg
1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00		FFFFFF	
2	2	0.00	10.00	0.00	0.00	0.00	0.00	0.00			
3	3	0.00	20.00	0.00	0.00	0.00	0.00	0.00			
4	4	0.00	30.00	0.00	0.00	0.00	0.00	0.00			
5	5	0.00	41.00	0.00	0.00	0.00	0.00	0.00			
6	6	0.00	52.00	0.00	0.00	0.00	0.00	0.00			
7	7	0.00	62.00	0.00	0.00	0.00	0.00	0.00			
8	8	0.00	72.00	0.00	0.00	0.00	0.00	0.00			
9	9	0.00	83.00	0.00	0.00	0.00	0.00	0.00			
10	10	0.00	94.00	0.00	0.00	0.00	0.00	0.00			
11	11	0.00	105.00	0.00	0.00	0.00	0.00	0.00			
12	12	0.00	115.00	0.00	0.00	0.00	0.00	0.00			

2 NODE PRISMATIC BEAM ELEMENT

E NO	NE NO	PE NO	ALPHA	BETA	GAMMA	LENGTH	MAT TYPE	PROP TYPE	RELEASE NE	RELEASE PE	REF TEMP	DIR	OFFSET NE	OFFSET PE	STIFFNESS NE	STIFFNESS PE
Units:			Deg	Deg	Deg	Ft					F		Ft	Ft	K /In /Deg	K /In /Deg
1	1	2	90.00	-90.00	0.00	10.00	1	1								
2	2	3	90.00	-90.00	0.00	10.00	1	2								
3	3	4	90.00	-90.00	0.00	10.00	1	3								
4	4	5	90.00	-90.00	0.00	11.00	1	4								
5	5	6	90.00	-90.00	0.00	11.00	1	5								
6	6	7	90.00	-90.00	0.00	10.00	1	6								
7	7	8	90.00	-90.00	0.00	10.00	1	7								
8	8	9	90.00	-90.00	0.00	11.00	1	8								
9	9	10	90.00	-90.00	0.00	11.00	1	9								
10	10	11	90.00	-90.00	0.00	11.00	1	10								
11	11	12	90.00	-90.00	0.00	10.00	1	11								

MATERIAL PROPERTIES

MATL NO	DESIGNATION	YOUNG'S MODULUS	POISSON'S RATIO	THERMAL COEFF	MASS DENSITY	WEIGHT DENSITY
Units:		K /In ^2		F	Slug/Ft^3	Lb/Ft ^3
1	Steel	2.9e+004	0.295	6.5e-006	15.2	490
2	Cable	9e+004	0.151	6.5e-006	11.9	382

2 NODE PRISMATIC BEAM ELEMENT PROPERTIES

PROP	DESIGNATION	A	IXX	IYY	J	IXY	SFY	SFX	CW
Units:		In^2	In^4	In^4	In^4	In^4			In^6
1	MANCH1	51.3	1.19e+004	1.19e+004	2.38e+004	0	1.000	1.000	0
2	MANCH2	49	1.04e+004	1.04e+004	2.07e+004	0	1.000	1.000	0
3	MANCH3	42.9	8.3e+003	8.3e+003	1.66e+004	0	1.000	1.000	0
4	MANCH4	37	6.42e+003	6.42e+003	1.28e+004	0	1.000	1.000	0
5	MANCH5	34.9	5.38e+003	5.38e+003	1.08e+004	0	1.000	1.000	0
6	MANCH6	32.9	4.5e+003	4.5e+003	9e+003	0	1.000	1.000	0
7	MANCH7	26.5	3.26e+003	3.26e+003	6.52e+003	0	1.000	1.000	0
8	MANCH8	20.3	2.17e+003	2.17e+003	4.34e+003	0	1.000	1.000	0
9	MANCH9	18.8	1.73e+003	1.73e+003	3.47e+003	0	1.000	1.000	0
10	MANCH10	17.4	1.36e+003	1.36e+003	2.71e+003	0	1.000	1.000	0
11	MANCH11	15.9	1.05e+003	1.05e+003	2.1e+003	0	1.000	1.000	0

2 NODE PRISMATIC BEAM ELEMENT LOAD INFORMATION

REC NO	LOAD TYPE	LOAD SYS	DIST SPEC		DIST	PX	PY	PZ	MX	MY	MZ
Units:					Ft	K	K	K	Ft-K	Ft-K	Ft-K
DESCRIPTION : Wind on section 1											
LOAD CASES : 1											
ELEMENT LIST : 1											
1	LINR	GLO	FRAC	B	0.000	0.103	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.103	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 2											
LOAD CASES : 1											
ELEMENT LIST : 2											
2	LINR	GLO	FRAC	B	0.000	0.098	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.098	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 3											
LOAD CASES : 1											
ELEMENT LIST : 3											
3	LINR	GLO	FRAC	B	0.000	0.094	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.094	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 4											
LOAD CASES : 1											
ELEMENT LIST : 4											
4	LINR	GLO	FRAC	B	0.000	0.091	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.091	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 5 & 6											
LOAD CASES : 1											
ELEMENT LIST : 5											
5	LINR	GLO	FRAC	B	0.000	0.093	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.093	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 5 & 6											
LOAD CASES : 1											
ELEMENT LIST : 6											
	LINR	GLO	FRAC	B	0.000	0.093	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.093	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on section 7											

LOAD CASES : 1
ELEMENT LIST : 7

7	LINR	GLO	FRAC	B	0.000	0.092	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.092	0.000	0.000	0.000	0.000	0.000

DESCRIPTION : Wind on section 8
LOAD CASES : 1
ELEMENT LIST : 8

8	LINR	GLO	FRAC	B	0.000	0.089	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.089	0.000	0.000	0.000	0.000	0.000

DESCRIPTION : Wind on section 9
LOAD CASES : 1
ELEMENT LIST : 9

9	LINR	GLO	FRAC	B	0.000	0.086	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.086	0.000	0.000	0.000	0.000	0.000

DESCRIPTION : Wind on section 10
LOAD CASES : 1
ELEMENT LIST : 10

10	LINR	GLO	FRAC	B	0.000	0.082	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.082	0.000	0.000	0.000	0.000	0.000

DESCRIPTION : Low-profile platform @ 100'
LOAD CASES : 1
ELEMENT LIST : 10
DISTANCES : 6

11	CONC	GLO	DIST			0.532	-1.000	0.000	0.000	0.000	0.000

DESCRIPTION : Wind on section 11
LOAD CASES : 1
ELEMENT LIST : 11

12	LINR	GLO	FRAC	B	0.000	0.078	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.078	0.000	0.000	0.000	0.000	0.000

DESCRIPTION : (12) DB844 on platform @ 113'
LOAD CASES : 1
ELEMENT LIST : 11
DISTANCES : 8

13	CONC	GLO	DIST			2.310	-1.400	0.000	0.000	0.000	0.000

GRAVITY LOAD MULTIPLIERS

REC NO	PX	PY	PZ

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 1

1	0.000	-1.300	0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 2

2	0.000	-1.300	0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 3

3	0.000	-1.300	0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 4

0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 5

5 0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 6

6 0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 7

7 0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 8

8 0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 9

0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 10

10 0.000 -1.300 0.000

DESCRIPTION : Self Weight
LOAD CASES : 1
ELEMENT LIST : 11

11 0.000 -1.300 0.000

REC NO	ALPHA	BETA	GAMMA	NODAL LOADS PX	PY	PZ	MX	MY	MZ
Units:	Deg	Deg	Deg	K	K	K	Ft-K	Ft-K	Ft-K

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 2

1 0.00 0.00 0.00 0.000 -0.130 0.000 0.000 0.000 0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 3

0.00 0.00 0.00 0.000 -0.130 0.000 0.000 0.000 0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 4

3	0.00	0.00	0.00	0.000	-0.130	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
CASES : 1
LIST : 5

4	0.00	0.00	0.00	0.000	-0.143	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 6

5	0.00	0.00	0.00	0.000	-0.143	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 7

6	0.00	0.00	0.00	0.000	-0.130	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 8

7	0.00	0.00	0.00	0.000	-0.130	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 9

8	0.00	0.00	0.00	0.000	-0.143	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
LIST : 10

9	0.00	0.00	0.00	0.000	-0.143	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 11

10	0.00	0.00	0.00	0.000	-0.143	0.000	0.000	0.000	0.000

DESCRIPTION : Waveguide d.l.
LOAD CASES : 1
NODE LIST : 12

11	0.00	0.00	0.00	0.000	-0.130	0.000	0.000	0.000	0.000

L I N E A R A N A L Y S I S R E S U L T S

N O D A L D I S P L A C E M E N T S

(* Indicates Displacements Occur in Nodal Local System)

NODE NO	LOAD COMB	DX	DY	DZ	OX	OY	OZ
Units:		In	In	In	Deg	Deg	Deg
2	1	0.2150	-0.0015	0.0000	0.0000	0.0000	-0.1977
3	1	0.8396	-0.0029	0.0000	0.0000	0.0000	-0.3909
4	1	1.8796	-0.0043	0.0000	0.0000	0.0000	-0.5935
5	1	3.5312	-0.0057	0.0000	0.0000	0.0000	-0.8288
6	1	5.7089	-0.0071	0.0000	0.0000	0.0000	-1.0498
7	1	8.1125	-0.0082	0.0000	0.0000	0.0000	-1.2347
8	1	10.9119	-0.0093	0.0000	0.0000	0.0000	-1.4258
9	1	14.4696	-0.0106	0.0000	0.0000	0.0000	-1.6439
10	1	18.4686	-0.0118	0.0000	0.0000	0.0000	-1.8085
11	1	22.7677	-0.0127	0.0000	0.0000	0.0000	-1.9051
12	1	26.7956	-0.0131	0.0000	0.0000	0.0000	-1.9286

2 NODE PRISMATIC BEAM ELEMENT -- ELEMENT REPORTS

SIGN CONVENTION : BEAM DESIGNERS

E... No.	LOAD COMB	NODE NO	AXIAL	TORSION	SHEAR X	MOMENT Y	MAX MOM/DEFL	DIST	SHEAR Y	MOMENT X	MAX MOM/DEFL	DIST
Units:			K	K -Ft	K	K -Ft	K -Ft / In	Ft	K	K -Ft	K -Ft / In	Ft
REPORT TYPE : Max Forces Full												
ELEMENT LIST : 1-11												
1	1	1	-19.8085	0.0000	0.0000	0.0000			13.2730	-890.4775		
		2	-17.5392	0.0000	0.0000	0.0000			12.2430	-762.8975	0.0517	4.94
2	1	2	-17.4092	0.0000	0.0000	0.0000			12.2430	-762.8975		
		3	-15.2416	0.0000	0.0000	0.0000			11.2630	-645.3675	0.0506	4.93
3	1	3	-15.1116	0.0000	0.0000	0.0000			11.2630	-645.3675		
		4	-13.2139	0.0000	0.0000	0.0000			10.3230	-537.4375	0.0530	4.92
4	1	4	-13.0839	0.0000	0.0000	0.0000			10.3230	-537.4375		
		5	-11.2835	0.0000	0.0000	0.0000			9.3220	-429.3900	0.0677	5.40
5	1	5	-11.1405	0.0000	0.0000	0.0000			9.3220	-429.3900		
		6	-9.4423	0.0000	0.0000	0.0000			8.2990	-332.4745	0.0636	5.38
6	1	6	-9.2993	0.0000	0.0000	0.0000			8.2990	-332.4745		
		7	-7.8439	0.0000	0.0000	0.0000			7.3690	-254.1345	0.0484	4.89
7	1	7	-7.7139	0.0000	0.0000	0.0000			7.3690	-254.1345		
		8	-6.5416	0.0000	0.0000	0.0000			6.4490	-185.0445	0.0500	4.87
8	1	8	-6.4116	0.0000	0.0000	0.0000			6.4490	-185.0445		
		9	-5.4238	0.0000	0.0000	0.0000			5.4700	-119.4900	0.0627	5.30
9	1	9	-5.2808	0.0000	0.0000	0.0000			5.4700	-119.4900		
		10	-4.3660	0.0000	0.0000	0.0000			4.5240	-64.5230	0.0473	5.22
10	1	10	-4.2230	0.0000	0.0000	0.0000			4.5240	-64.5230		
		11	-2.3764	0.0000	0.0000	0.0000			3.0900	-22.3800	0.0276	5.03
11	1	11	-2.2334	0.0000	0.0000	0.0000			3.0900	-22.3800		
		12	-0.1300	0.0000	0.0000	0.0000			0.0000	0.0000	-4.0278	10.00

R E A C T I O N S

(* Indicates Reactions Occur in Nodal Local System)

NODE NO	LOAD COMB	PX	PY	PZ	MX	MY	MZ
Units:		K	K	K	K -Ft	K -Ft	K -Ft
1	1	-13.2730	19.8085	0.0000	0.0000	0.0000	890.4775

P-D E L T A A N A L Y S I S R E S U L T S

N O D A L D I S P L A C E M E N T S

(* Indicates Displacements Occur in Nodal Local System)

NODE NO	LOAD COMB	DX	DY	DZ	OX	OY	OZ
Units:		In	In	In	Deg	Deg	Deg
2	1	0.2187	-0.0017	0.0000	0.0000	0.0000	-0.2012
3	1	0.8546	-0.0048	0.0000	0.0000	0.0000	-0.3982
4	1	1.9145	-0.0108	0.0000	0.0000	0.0000	-0.6051
5	1	3.5994	-0.0230	0.0000	0.0000	0.0000	-0.8460
6	1	5.8233	-0.0431	0.0000	0.0000	0.0000	-1.0725
7	1	8.2795	-0.0693	0.0000	0.0000	0.0000	-1.2623
8	1	11.1421	-0.1045	0.0000	0.0000	0.0000	-1.4586
9	1	14.7824	-0.1560	0.0000	0.0000	0.0000	-1.6828
10	1	18.8763	-0.2207	0.0000	0.0000	0.0000	-1.8520
11	1	23.2782	-0.2949	0.0000	0.0000	0.0000	-1.9511
12	1	27.4023	-0.3662	0.0000	0.0000	0.0000	-1.9752

2 NODE PRISMATIC BEAM ELEMENT -- ELEMENT REPORTS

SIGN CONVENTION : BEAM DESIGNERS

EL NO	LOAD COMB	NODE NO	AXIAL	TORSION	SHEAR X	MOMENT Y	MAX MOM/DEFL	DIST	SHEAR Y	MOMENT X	MAX MOM/DEFL	DIST
Units:			K	K -Ft	K	K -Ft	K -Ft / In	Ft	K	K -Ft	K -Ft / In	Ft
REPORT TYPE : Max Forces Full												
ELEMENT LIST : 1-11												
1	1	1	-19.7843	0.0000	0.0000	0.0000			13.3091	-905.0724		
		2	-17.5169	0.0000	0.0000	0.0000			12.2750	-777.1522	0.0526	4.94
2	1	2	-17.3441	0.0000	0.0000	0.0000			12.3350	-777.1520		
		3	-15.1817	0.0000	0.0000	0.0000			11.3436	-658.7590	0.0515	4.93
3	1	3	-15.0115	0.0000	0.0000	0.0000			11.3962	-658.7595		
		4	-13.1222	0.0000	0.0000	0.0000			10.4395	-549.5811	0.0541	4.92
4	1	4	-12.9511	0.0000	0.0000	0.0000			10.4890	-549.5814		
		5	-11.1636	0.0000	0.0000	0.0000			9.4651	-439.8333	0.0693	5.40
5	1	5	-10.9818	0.0000	0.0000	0.0000			9.5084	-439.8324		
		6	-9.3011	0.0000	0.0000	0.0000			8.4569	-341.0234	0.0652	5.38
6	1	6	-9.1274	0.0000	0.0000	0.0000			8.4879	-341.0253		
		7	-7.6914	0.0000	0.0000	0.0000			7.5283	-260.9439	0.0496	4.89
7	1	7	-7.5359	0.0000	0.0000	0.0000			7.5511	-260.9465		
		8	-6.3859	0.0000	0.0000	0.0000			6.6034	-190.1736	0.0513	4.87
8	1	8	-6.2315	0.0000	0.0000	0.0000			6.6229	-190.1721		
		9	-5.2711	0.0000	0.0000	0.0000			5.6170	-122.8525	0.0645	5.30
	1	9	-5.1085	0.0000	0.0000	0.0000			5.6315	-122.8516		
		10	-4.2235	0.0000	0.0000	0.0000			4.6575	-66.2620	0.0487	5.23
10	1	10	-4.0696	0.0000	0.0000	0.0000			4.6624	-66.2644		
		11	-2.2718	0.0000	0.0000	0.0000			3.1676	-22.9166	0.0283	5.03
11	1	11	-2.1262	0.0000	0.0000	0.0000			3.1646	-22.9157		
		12	-0.1303	0.0000	0.0000	0.0000			0.0042	-0.0014	0.0061	3.84

R E A C T I O N S

(* Indicates Reactions Occur in Nodal Local System)

NODE NO	LOAD COMB	PX	PY	PZ	MX	MY	MZ
Units:		K	K	K	K -Ft	K -Ft	K -Ft
1	1	-13.2730	19.8085	0.0000	0.0000	0.0000	905.0724

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT** Job No.: **CT141230**
Calculated By: **R. Adair** Date: **16-Jan-03**

Total Moment (ft-kips) ***Axial Loads (kips)*** ***Shear (kips)***

Elevation	Mom. w/o Ice	75% Mom w/ Ice	100% Mom w/ Ice	Secondary	D+A Force	D+A+I Force	Secondary	Tower (lbs.)	Antenna (lbs)	Total (kips)	Secondary
0	**891.4**	**465.1**	**620.1**	**905**	**16.9**	**19.2**	**19.8**	11138	2842	**13.98**	**13.3**
10	**763.7**	**385.6**	**514.1**	**777**	**14.9**	**17.0**	**17.3**	10057	2842	**12.90**	**12.3**
20	**646.1**	**314.1**	**418.7**	**659**	**13.0**	**14.9**	**15.0**	9021	2842	**11.86**	**11.4**
30	**538.1**	**250.1**	**333.5**	**550**	**11.3**	**12.9**	**13.0**	8030	2842	**10.87**	**10.5**
41	**430.0**	**188.2**	**251.0**	**440**	**9.7**	**11.1**	**11.0**	6971	2842	**9.81**	**9.5**
52	**333.0**	**135.2**	**180.3**	**341**	**8.2**	**9.3**	**9.1**	5887	2842	**8.73**	**8.5**
62	**254.5**	**94.7**	**126.3**	**261**	**7.0**	**7.9**	**7.5**	4899	2842	**7.74**	**7.6**
72	**185.3**	**61.7**	**82.2**	**190**	**5.8**	**6.5**	**6.2**	3919	2842	**6.76**	**6.6**
83	**119.6**	**33.7**	**44.9**	**123**	**5.0**	**5.5**	**5.1**	2863	2842	**5.70**	**5.6**
94	**64.6**	**14.3**	**19.1**	**66**	**4.1**	**4.4**	**4.1**	1838	2842	**4.68**	**4.7**
105	**22.4**	**3.2**	**4.3**	**23**	**2.2**	**2.4**	**2.1**	854	2310	**3.16**	**3.2**

All-Points Technology Corp., P.C.
150 Old Westside Road
North Conway, NH 03860
(603) 356-5214

Client: **Verizon Wireless**
Job: **Manchester, CT**
Calculated By: **R. Adair**

Job No.: **CT141230**
Date: **16-Jan-03**

Axial Stresses

				Stress Ratio
Elev.	w/o ice	Area	Fy	w/o ice
0	19.8	52.42	65	**0.38**
10	17.3	50.12	65	**0.35**
20	15.0	47.82	65	**0.31**
30	13.0	38.06	65	**0.34**
41	11.0	35.94	65	**0.31**
52	9.1	33.83	65	**0.27**
62	7.5	31.91	65	**0.24**
72	6.2	21.05	65	**0.29**
83	5.1	19.57	65	**0.26**
94	4.1	18.10	65	**0.23**
105	2.1	16.62	65	**0.13**

Bending Stresses

	fb= Moment/Section Modulus			Allowable		Actual
Elev.	w/o ice	S	$(F_Y)^{1/2}$ w/t	F_b	1.33 F_b	w/o ice
0	905.0	578.44	252.6	**38.12**	**50.70**	**18.77**
10	777.0	528.58	241.6	**38.92**	**51.77**	**17.64**
20	659.0	480.97	240.0	**39.04**	**51.93**	**16.44**
30	550.0	365.37	263.1	**37.35**	**49.68**	**18.06**
41	440.0	325.79	248.7	**38.41**	**51.09**	**16.21**
52	341.0	288.47	240.0	**39.04**	**51.93**	**14.19**
62	261.0	256.52	240.0	**39.04**	**51.93**	**12.21**
72	190.0	159.93	297.0	**34.88**	**46.39**	**14.26**
83	123.0	138.19	276.3	**36.39**	**48.40**	**10.68**
94	66.0	118.04	255.6	**37.90**	**50.41**	**6.71**
105	23.0	99.47	240.0	**39.04**	**51.93**	**2.77**

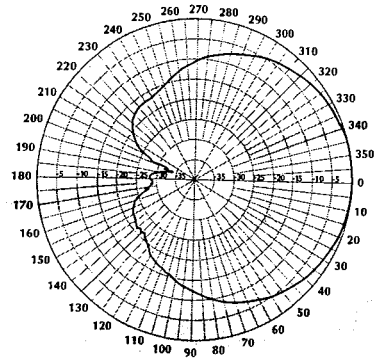
Tower Capacity

Elev.	Comb. Str. Ratio	Capacity
0	**0.378**	**38%**
10	**0.347**	**35%**
20	**0.323**	**32%**
30	**0.370**	**37%**
41	**0.323**	**32%**
52	**0.278**	**28%**
62	**0.240**	**24%**
72	**0.314**	**31%**
83	**0.226**	**23%**
94	**0.138**	**14%**
105	**0.056**	**6%**

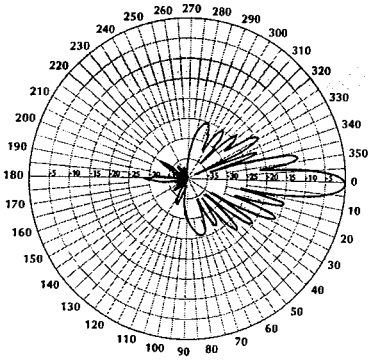
Panel 90°/14, 15 dBd

RWB-80015/90, RWB-80015/90LS

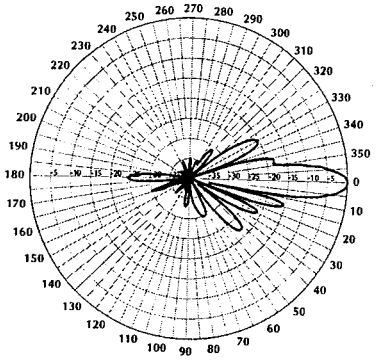
Radiation-pattern
(at mid-band)



Horizontal



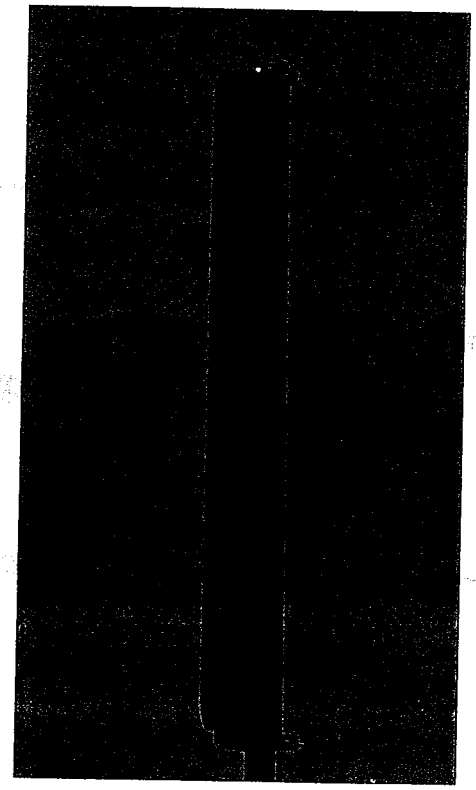
RWB-80015/90 Vertical



RWB-80015/90LS Vertical

RWB-80015/90LS specially designed for enhanced upper side lobe suppression.

Radiation patterns for all Antel antennas are measured with the antenna mounted on a fiberglass pole. Mounting on a metal pole will typically improve the Front-to-Back Ratio.



Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- A 1 1/4" four-channel extrusion running the entire length of the antenna for unmatched strength and rigidity.
- Durable brass feedline design that eliminates the need for solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band width and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna can be ordered with bottom-fed or center-fed connector. For center-fed connector, order model number RWB-80015/90CF or RWB-80015/90LSCF + connector (N, NE, DIN, E-DIN).
Example: RWB-80015/90LSCF-E-DIN

Mechanical specifications

Length	2450	mm	96.5	in
Width	295	mm	11.6	in
Depth	160	mm	6.3	in
Weight	14	kg	31	lbs
Wind area	0.73	m^2	7.87	ft^2
Wind load at 50m/s	1140	N	256	lbs

Mounting

Through two pair of clamps to pipe diameter Ø50-160 mm (2.0-6.3 in), or by U-clamps to a 2" pipe.

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting Bracket #36210002
Downtilt Bracket #36114003

Electrical specifications

Frequency range	806-960 MHz
Impedance	50Ω
3) Connector	N, NE, DIN, E-DIN or EIA
1) VSWR	≤1.4:1
Polarization	Vertical
1) Gain	
RWB-80015/90	15 dBd
RWB-80015/90LS	14 dBd
2) Power rating	500 W
1) Half power angle	
H-plane	90°
E-plane	7°
1) Lobe tilt	
RWB-80015/90	1.25°
RWB-80015/90LS	0°
1) Null fill	5%
Lightning protection	Direct ground

For a list of models, including electrical downtilt and/or null fill combinations, see page 141.

1) Typical values.
2) Power Rating limited by connector only.
3) NE indicates an elongated N Connector.
E-DIN indicates an elongated DIN Connector.
EIA indicates a 7/8" EIA Flange.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

RWA-80017, RWA-80017LS

Mechanical specifications

Length	2450	mm	96.5	in
Width	295	mm	11.6	in
Depth	160	mm	6.3	in
Weight	14	kg	31.0	lbs
Wind area	0.73	m^2	7.8	ft^2
Wind load at 50m/s	1140	N	256	lbs

Mounting

Through two pair of clamps to pipe diameter Ø50-160 mm (2.0-6.3 in), or by U-clamps to a 2" pipe.

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting Bracket #36210002
Downtilt Bracket #36114003

Electrical specifications

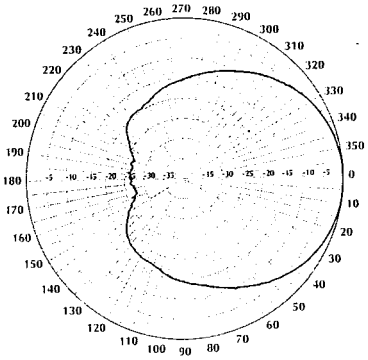
Frequency range	806-960 MHz
Impedance	50Ω
3) Connector	N, NE, DIN, E-DIN or EIA
1) VSWR	≤1.4:1
Polarization	Vertical
1) Gain	
RWA-80017	17 dBd
RWA-80017LS	16 dBd
2) Power rating	500 W
1) Half power angle	
H-plane	62°
E-plane	7°
1) Lobe tilt	
RWA-80017	1.25°
RWA-80017LS	0°
1) Null fill	5%
Lightning protection	Direct ground

For a list of models, including electrical downtilt and/or null fill combinations, see page 139.

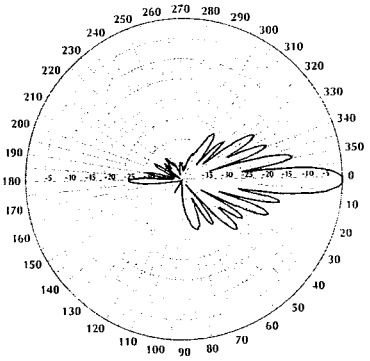
1) Typical values.
2) Power Rating limited by connector only.
3) NE indicates an elongated N Connector. E-DIN indicates an elongated DIN Connector. EIA indicates a 7/8" EIA Flange.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

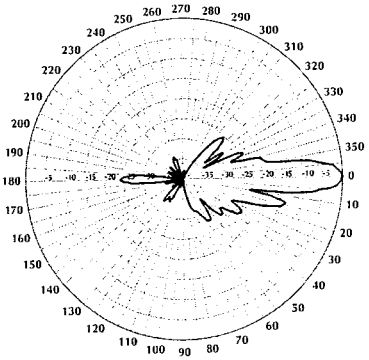
Radiation-pattern
(at mid-band)



Horizontal



RWA-80017 Vertical

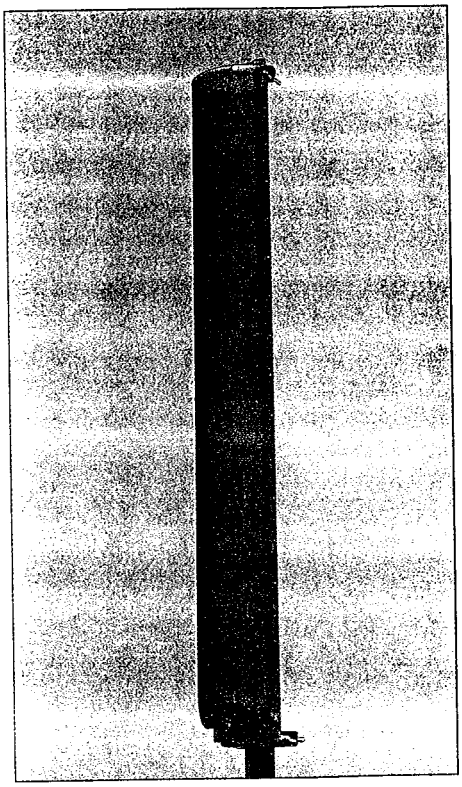


RWA-80017LS Vertical

RWA-80017LS specially designed for enhanced upper side lobe suppression.

Radiation patterns for all Antel antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.



Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

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- A non-collinear system with access to every radiating element for broad band width and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna can be ordered with bottom-fed or center-fed connector. For center-fed connector, order model number RWA-80017CF + connector or RWA-80017LSCF + connector (N, NE, DIN, E-DIN).

Example: RWA-80017LSCF E-DIN

ALL-POINTS TECHNOLOGY CORPORATION, P.C.

February 3, 2003

Verizon Wireless
99 East River Drive, 9th Floor
East Hartford, CT 06108

Attn: Wayne Lukachek
Re: 115' Valmont Monopole Tower
Manchester, Connecticut
Crown Castle BU #806372

Dear Wayne,

All-Points Technology Corporation, P.C. analyzed Crown Castle's 115' Valmont monopole tower located off Route 6 in Manchester, Connecticut. The analysis was conducted in accordance with EIA/TIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* for replacement of Verizon Wireless' existing fifteen panel antennas with twelve DB844 panel antennas. Our results were submitted in a structural analysis report dated January 24, 2003.

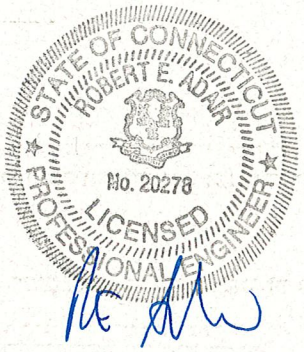
Subsequent to the analysis, Verizon Wireless requested the structure be evaluated for installation of eight Antel RWB-80015/90LS and four Antel RWA-80017LS panel antennas in lieu of the DB844 antennas. Our analysis indicates the tower and foundation are capable of supporting Verizon's proposed antenna installation. Results are as follows:

Elevation	Capacity
0'-30'	**56%**
30'-72'	**54%**
72'-115'	**41%**

We appreciate this opportunity to provide you with our services. Please call if you have any questions.

Sincerely,
All-Points Technology Corporation, P.C.

Robert E. Adair, P.E.
Principal



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☐ 711 NORTH MOUNTAIN ROAD • NEWINGTON, CONNECTICUT 06111 • PHONE: 860-953-4444 • FAX: 860-953-1181
☒ 150 OLD WESTSIDE ROAD • NORTH CONWAY, NEW HAMPSHIRE 03860 • PHONE/FAX: 603-356-5214