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

Daniel F. Caruso
Chairman

May 19, 2010

Andrew Moon, Esq.
Pocket Communications
2819 NW Loop 410
San Antonio, TX 78230

RE: **EM-POCKET-004-081112** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut.

Dear Attorney Moon:

The Connecticut Siting Council (Council) hereby acknowledges your proposed revision to the previously acknowledged modifications to the above referenced telecommunications facility by using 7/8" coax cables instead of the 1 5/8" coax cables that were originally specified.

The proposed modifications are to be implemented as specified in your letter dated May 5, 2010. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies.

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.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/CDM/laf

c: The Honorable Mark W. Zacchio, Chairman Town Council, Town of Avon
Brandon Robertson, Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
TowerCo

pocket COMMUNICATIONS

May 5, 2010

Connecticut Siting Council
Attn: S. Derek Phelps
Ten Franklin Square
New Britain, CT 06051

ORIGINAL

RECEIVED
MAY 10 2010
CONNECTICUT
SITING COUNCIL

Re: EM-Pocket-004-081112 – Youghiogheny Communications – Northeast, LLC d/b/a Pocket Communications (Pocket), Notice of Change in Coax Size, Pocket Site ID HFCT-1481A.

Dear Executive Director Phelps;

The referenced site located at 277 Huckleberry Hill Road, Avon, Connecticut was approved by the Connecticut Siting Council (CSC) on December 11, 2008 for modifications to add equipment and shelters for use as a communications facility for Pocket. Part of that particular approval approved the site for a total of six 1 5/8" coax cables. In a recent review of lease terms with the managing agent it was determined that our license only allows for six 7/8" coax cables. The managing agent is unwilling to amend the license and is requiring that we downgrade the facilities to the 7/8" coax cables.

Pocket would like to request acknowledgment and approval from CSC of this change. There will be no increased radio frequency exposure and there will be not be an increased tower rating. Please respond with your approval so that we may make the changes to the tower in a timely manner. If there are any questions please forward them to me by any of the following methods:

Direct Phone: 210.861.2200

E-mail: amoon@pocket.com

Mail: 2819 NW Loop 410
San Antonio, TX 78230.

I appreciate your prompt response and assistance. I have enclosed five copies of this letter for distribution to the remainder of the CSC. If anything else may be required please do not hesitate to contact me via one of the above methods.

Best Regards,

Andrew Moon
Legal Counsel

CC: Michael Perrone

PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

CARRIE L. LARSON
90 State House Square
Hartford, CT 06103-3702
p (860) 424-4312
f (860) 424-4370

www.pullcom.com

ORIGINAL

February 20, 2009

Via Federal Express

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

Re: EM- POCKET-004-081112
TowerCo formerly known as Sprint Sites USA Telecommunications Facility
277 Huckleberry Hill Road, Avon, Connecticut

Dear Mr. Phelps:

Pursuant to your letter dated December 11, 2008 (a copy of which is attached), I have enclosed the new structural for the site indicating that it is below 100%, signed by a professional engineer.

If you should need anything further, please feel free to contact me.

Respectfully Submitted,

Carrie L. Larson

Enclosure

SEMAAN
ENGINEERING SOLUTIONS, LLC

Structural Analysis Report

Prepared for:

TowerCo LLC
5000 Valleystone Drive
Cary, NC 27519

ATTN: Mr. Stephen Rambeau

Structure	:	100 ft ELAM Laminated Wood Monopole
Proposed Carrier	:	Pocket Communications
Site ID	:	CT2020
Site Name	:	Avon, CT
County	:	Hartford
Date	:	December 3, 2008
Usage	:	95.4%

Semaan Engineering Solutions, LLC
1079 N. 205th Street
Elkhorn, NE 68022
Phone: 402-289-1888

2/19/09

Introduction

The purpose of this report is to summarize results of the structural analysis performed on the 100 ft ELAM laminated wood monopole located at Avon, CT, Hartford County (site #CT2020). The tower was originally designed and manufactured by ELAM (Drawing #SPSM-0079.06A1 Rev 3 dated July 29, 2005).

Analysis

The tower was analyzed using Semaan Engineering Solutions, Inc., Software. The analysis assumes that the tower is in good, undamaged, and non-corroded condition. The analysis was performed in conformance with TIA/EIA-222 Rev F and local building codes for a basic wind speed of 80 mph and 1/2" radial ice with reduced wind speed (fastest mile). This is in conformance with the IBC 2006: Section 1609.1.1, Exception (4) and Section 3108.4.

Basic Wind Speed: 80.0 mph
Radial Ice: 70 mph w/ 0.50" ice
Code: TIA/EIA-222 Rev F

Antenna Loads

The following antenna loads were used in the tower analysis.

Existing Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax (in)	Carrier
100.0	3	RR90-17-00DP	Flush mounts	(12) 1 5/8	Sprint
90.0	6	21401 TMA	Flush mounts	-	Cingular
	3	Powerwave 7770		(12) 1 5/8	

Proposed Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax (in)	Carrier
80.0	3	APXV18-206517	Flush mounts	(6) 7/8	Pocket Communication

All transmission lines are assumed running outside of the pole shaft. Each carrier is assumed to be stacked two lines deep on their own side of the pole.

Results

The existing monopole is structurally capable of supporting the existing and proposed antennas.

The maximum structure usage is: 95.4%.

Pole Reactions	Original Design Reactions	Current Analysis Reactions	% Of Design
Moment (ft-kips)	724.60	708.41	97.8

The analysis reactions are less than the design reactions therefore no foundation modifications are required.

Conclusion

Based on the analysis results, the existing structure meets the requirements per the TIA/EIA-222 Rev F standards for a basic wind speed of 80 mph and 1/2" radial ice with reduced wind speed.

If you have any questions or require additional information, please call 402-289-1888.

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, the antenna and feed line loading on the structure and its components, or other relevant information.

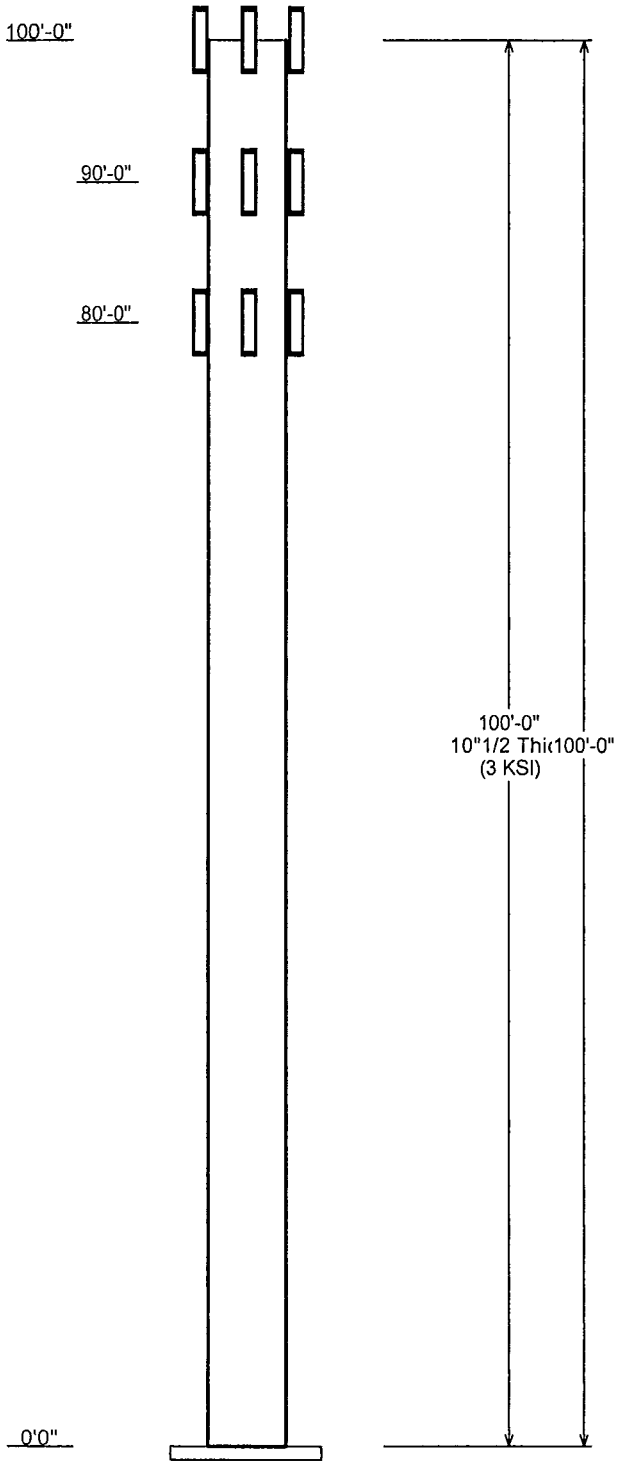
-- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore, assume that their capacity has not significantly changed from the "as new" condition.

All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/EIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

SEMAAN ENGINEERING SOLUTIONS
1079 N.204th Avenue
Elkhorn, NE 68022
Phone: 402-289-1888
Fax: 402-289-1861



Job Information

Pole :	CT2020	Code: TIA/EIA-222 Rev F	
Description :			
Client :	TowerCo LLC		
Location :	Avon, CT		
Shape :	Round	Base Elev (ft):	0.00
Height :	100.00 (ft)	Taper:	0.000000(in/ft)

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	100.00	26.25	26.25	10.5		0.000	0.000000	3

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
100.000	100.000	3	RR90-17-00DP
90.000	90.000	6	21401 TMA
90.000	90.000	3	Powerwave 7770
80.000	80.000	3	APXV18-206517

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	80.000	7/8" Coax	No
0.000	90.000	1 5/8" Coax	Yes
0.000	100.0	1 5/8" Coax	Yes

Load Cases

No Ice	80.00 mph Wind with No Ice
Ice	69.28 mph Wind with Ice

Reactions

Load Case	Moment (Kip-ft)	Shear (Kips)	Axial (Kips)
No Ice	546.27	8.21	13.74
Ice	497.80	7.37	18.14

Wood Pole Spreadsheet (no ice)

Site # CT33XC589 / CT2020

Address 227 Huckleberry St., Avon, CT

Pole class =

Pole Parameters

Width (trans) (in) =	26.25
Top Depth (long) (in) =	12
Bottom Depth (long) (in) =	30.25
AGL Height (ft) =	100
BGL Embed (ft) =	17.5
Wood Species =	
S_{bot} (trans) (in^3) =	4003.4
S_{bot} (long) (in^3) =	3474.0

Wind Loads

wind pressure (psf) = 41.54 (80/85)^2x46.9 = 41.54 for 80 mph

Item	area (sf)	CL elev (ft)	force (lbs)	moment (ft-lbs)
Pole (long)	176.04	42.80	7313	312992
Pole (trans)	218.75	50.00	9087	454344
Sprint (3x5.23/1.4)	14.02	100.00	582	58239
Cingular ((3x5.88+6x.95)/1.4)	16.67	90.00	692	62322
Pocket(3x5.024x.73/1.4)	7.86	80.00	327	26120
Coax (2-1 5/8 and 2-7/8 exposed)	51.70	50.00	2148	107381
Total (long) =			**11062**	**567055**
Total (trans) =			**12836**	**708407**

f_b (long) (psi) =	1959	
f_b (trans) (psi) =	2123	
Allow. Long. Bend. Stress (psi) =	2053	95.4%
Allow. Trans. Bend Stress (psi) =	2500	84.9%

Site:	CT33XC589 / CT2020
M (ft-lbs) =	708407
V (lbs) =	12836.0
h (ft) =	55.19
Allow. Lateral brg. Pressure (psf) =	400
Embedment depth (ft) =	17.50
S_1 =	2333
b (ft) =	5.00
A =	2.57
Min. embed depth (ft) =	15.02

STATE OF CONNECTICUT
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Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 11, 2008

Carrie L. Larson, Esq.
Pullman & Comley, LLC
90 State House Square
Hartford, CT 06103-3702

RE: **EM-POCKET-004-081112** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut.

Dear Attorney Larson:

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 following conditions:

- A post-construction tower rating of not more than 100 percent is achieved; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that a post-construction tower rating of not more than 100 percent has been achieved.

The proposed modifications are to be implemented as specified here and in your notice dated November 11, 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

CSC
CONNECTICUT SITING COUNCIL

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,

S. Derek Phelps
Executive Director

SDP/CDM/laf

c: The Honorable John F. Carlson, Chairman Town Council, Town of Avon
Philip K. Schenck, Jr., Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
TowerCo

PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

CARRIE L. LARSON
90 State House Square
Hartford, CT 06103-3702
p (860) 424-4312
f (860) 424-4370

www.pullcom.com

February 4, 2010

Via Hand Delivery

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

Re: EM- POCKET-004-081112
TowerCo formerly known as Sprint Sites USA Telecommunications Facility
277 Huckleberry Hill Road, Avon, Connecticut

Dear Mr. Phelps:

On January 20, 2010, Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), submitted a revised structural report for the above-referenced facility. Pursuant to your letter dated December 11, 2008, the above-referenced exempt modification was approved with 7/8" coax cable being utilized instead of Pocket's usual configuration of 1-5/8" coax cable. Since that time, the additional structural analysis was performed and it was determined that Pocket could utilize 1-5/8" coax cable. The report indicated that the capacity for the tower was below 100%, with the use of the 1-5/8" coax cable. For a number of reasons, Pocket has now determined that using the 7/8" cable is their most efficient option at this site. This is to inform you that Pocket will now be going back to it's original planned configuration and will be utilizing 7/8" coax cable at this site.

If you should need anything further, please feel free to contact me.

Respectfully Submitted,

Carrie L. Larson

PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

CARRIE L. LARSON
90 State House Square
Hartford, CT 06103-3702
p (860) 424-4312
f (860) 424-4370

www.pullcom.com

ORIGINAL

January 20, 2010

Via Federal Express

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

Re: EM- POCKET-004-081112
TowerCo formerly known as Sprint Sites USA Telecommunications Facility
277 Huckleberry Hill Road, Avon, Connecticut

Dear Mr. Phelps:

Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), hereby submits a revised structural report for the above-referenced facility. Pursuant to your letter dated December 11, 2008 (a copy of which is attached), the above-referenced exempt modification was approved with 7/8" coax cable being utilized instead of Pocket's usual configuration of 1-5/8" coax cable. Since that time, an additional structural analysis was performed and it was determined that Pocket could utilize 1-5/8" coax cable. The report indicates that the capacity for the tower is below 100%, with the use of the 1-5/8" coax cable. This is to inform you that Pocket will be utilizing 1-5/8 coax cable on this site in accordance with this revised report.

If you should need anything further, please feel free to contact me.

Respectfully Submitted,

Carrie L. Larson

Enclosure

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
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December 11, 2008

Carrie L. Larson, Esq.
Pullman & Comley, LLC
90 State House Square
Hartford, CT 06103-3702

RE: **EM-POCKET-004-081112** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut.

Dear Attorney Larson:

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 following conditions:

- A post-construction tower rating of not more than 100 percent is achieved; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that a post-construction tower rating of not more than 100 percent has been achieved.

The proposed modifications are to be implemented as specified here and in your notice dated November 11, 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

CSC
CONNECTICUT SITING COUNCIL

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,

S. Derek Phelps
Executive Director

SDP/CDM/laf

c: The Honorable John F. Carlson, Chairman Town Council, Town of Avon
Philip K. Schenck, Jr., Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
TowerCo

NATCOMM INC.
CONSULTING ENGINEERS

Structural Analysis Report

100-ft Existing Laminated Wood Monopole

Tower Co. Id #CT2020A

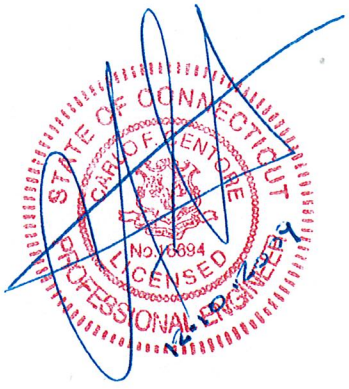
Proposed Pocket Wireless
Antenna Installation

Pocket Wireless Site Ref:
HFCT1481-Avon Landfill

277 Huckleberry Hill Road
Avon, CT

Natcomm Project No. 09127

~~Date: November 12, 2009~~
Rev 1: December 9, 2009



Prepared for:

Grapevine Solutions, Inc.
P.O. Box 30214
Knoxville, TN 37922

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

Table of Contents

Natcomm, Inc.
Structural Analysis ~ Pocket Wireless
100' Existing ELAM Laminated Wood Monopole
Avon, CT
Rev 1 ~ December 9, 2009

Introduction

The purpose of this report is to summarize the results of the structural analysis of the antenna installation proposed by Pocket Wireless on the existing laminated wood monopole (tower) owned and operated by Tower Co. located in Avon, Connecticut.

The host tower is a 100-ft tall, four sided, tapered, laminated wood monopole originally designed and manufactured by Laminated Wood Systems, dated July 28, 2005. The tower geometry, structure member sizes and foundation system information were obtained from the original design documents. Antenna and appurtenance information were obtained from a previous structural analysis prepared by Semaan Engineering Solutions dated November 4, 2008. Existing quantity, size and coaxial cable configuration obtained from site documentation provided by Pocket Wireless. Refer to drawing EL-1 within Section 3 of this report for further information.

The width of the pole is 26.25-in (bottom and top) in the transverse direction and 30.25-in (top) and 12.0-in (bottom) in the longitudinal direction.

Pocket Wireless is proposing the installation of three (3) flush mounted panel antennas and six (6) coaxial cables. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing tower was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- SPRINT (Existing):
  Antennas: Three (3) RR90-17-00DP panel antennas flush mounted with a RAD center elevation of 100-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the face of the structure as indicated in section 3 of this report.
- AT&T (Existing):
  Antennas: Three (3) Powerwave 7770 panel antennas and six (6) Powerwave LGP-214 TMA's flush mounted with a RAD center elevation of 90-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the face of the structure as indicated in section 3 of this report.
- **POCKET (Proposed):**
  Antennas: Three (3) RFS APXV18-206517 panel antennas flush mounted with a RAD center elevation of 80-ft above the existing tower base.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the face of the structure as indicated on drawing EL-1 within section 3 of this report.

Primary Assumptions Used in the Analysis

- **Wind Profile:** (per Vertical Solutions email dated 11/23/09)
  - Velocity Pressure qz calculated using ASEC 7-02 Section 6.5.13 Design Wind Loads on Open Buildings and Other Structures.
  - Velocity pressure evaluated at a height of 100' AGL for the laminated pole and for the coax cables.
  - Velocity pressure evaluated at RAD center height for antennas and TMA's (100' for Sprint, 90' for AT&T and 80' for Pocket).
  - Three (3) cables exposed to wind in the longitudinal direction from 0'-80'.
  - Two (2) cables exposed to wind in the longitudinal direction from 80'-90'.
  - No cables exposed to wind in the longitudinal direction from 90'-100'.
  - Two (2) cables exposed to wind in the transverse direction from 0'-100'.
  - All existing coax cables to be installed as indicated in section 3 drawing EL-1 of this report.
  - Force coefficient Cf calculated using ASCE 7-02 figure 6-19 for chimneys, tanks, rooftop equipment and similar structures.
- **Gust Response Factor:** (per Vertical Solutions email dated 11/23/09)
  - Gust response factor G taken as 0.89 from NESC C2-2002 Table 250-3 for a structure height between 80' and 115'.
- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.

Analysis

The existing tower was analyzed for 95 mph basic wind speed (3 second gust) with no ice and a 50 mph basic wind speed (3 second gust) with 1 inch accumulative ice to determine stresses in the existing laminated wood pole as per NDS-2001.

Structure Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per IBC-2003, SEI/ASCE 7-02 and NESC C2-2002, gravity loads of the structure and its components, and the application of 1" radial ice to the structure and its components.

Basic Wind Speed:	Avon; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
Load Cases:	Load Case 1; 80 mph wind speed w/ no ice plus gravity load – used in calculation of stresses and rotation. This load case typically controls the design of monopole towers.	*[IBC 2003 SEI/ASCE 7-02]]*
	Load Case 2; 50 mph wind speed w/ 1" radial ice plus gravity load – used in calculation of stresses. This load case typically controls the design of lattice towers.	*[IBC 2003 SEI/ASCE 7-02]]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

Natcomm, Inc.
Structural Analysis ~ Pocket Wireless
100' Existing ELAM Laminated Wood Monopole
Avon, CT
Rev 1 ~ December 9, 2009

Tower Capacity

Calculated stresses were found to be within allowable limits. The tower was found to be at **92.0%** of its total capacity.

Direction	Stress Ratio (percentage of capacity)	Result
Transverse	83.2%	**PASS**
Longitudinal (Pocket w/ 1-5/8" ø coax cable)	92.0%	**PASS**
Longitudinal (Pocket w/ 7/8" ø coax cable)	90.3%	**PASS**

Foundation

The existing foundation consists of an 5.0-ft Ø x 17.5-ft long reinforced concrete pier fully embedded into the ground. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned Laminated Wood Systems original tower design documents.

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

- The foundation was found to be within allowable limits.

Foundation	Actual Embedment	Required Embedment	Result
Reinf. Conc. Pier	17.5 ft	13.8 ft	**PASS**

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 Pocket 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

STATE OF CONNECTICUT
CARLO F. CENTORE
No.16694
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, EIT
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Natcomm, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provide to Natcomm, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Natcomm, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

General Description of Structural Analysis Program

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDNF and ProSteel 3D files

Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms

- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.
- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

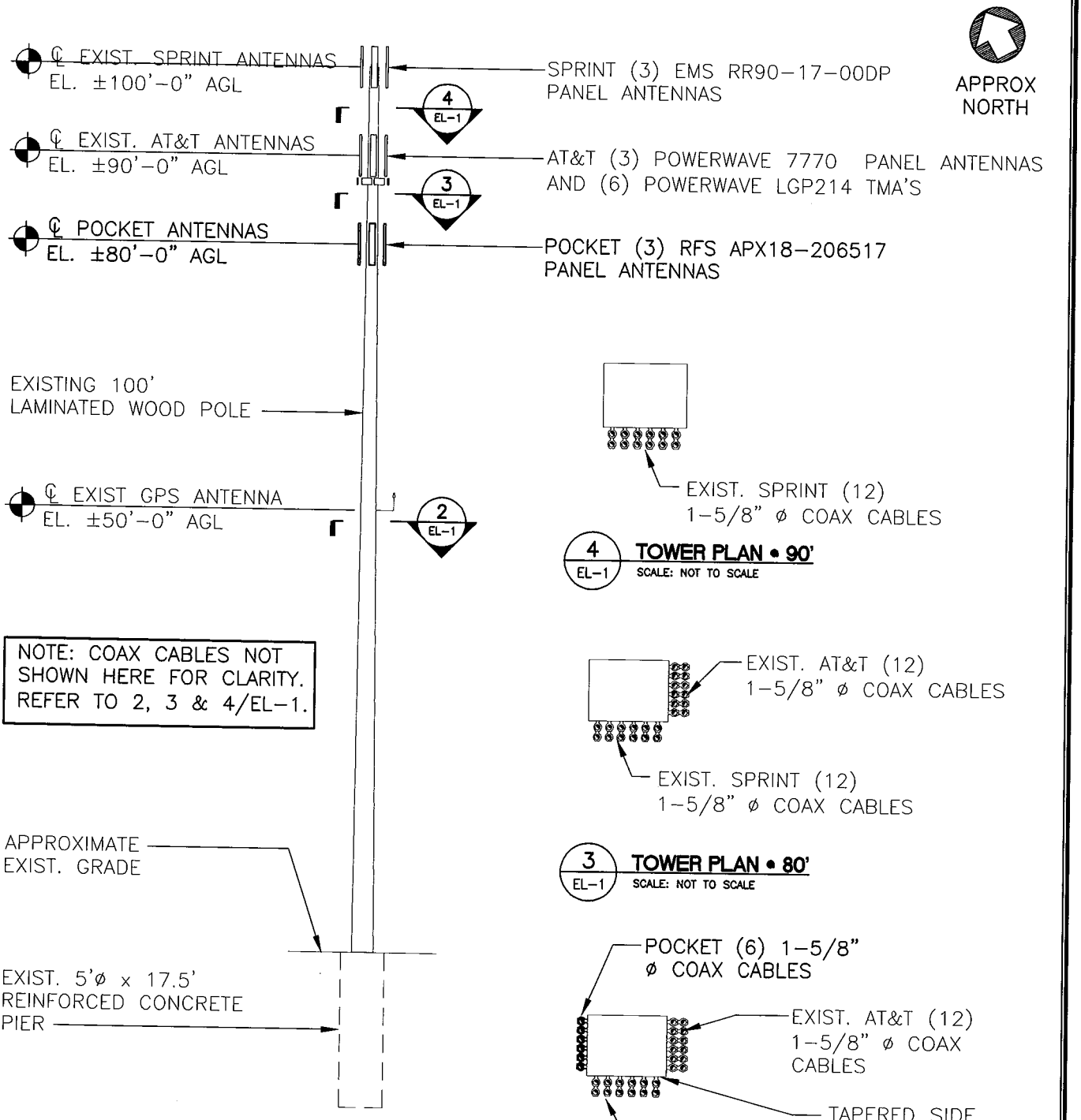
- Unlimited simultaneous model view windows
- Extraordinary "true to scale" rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000,EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, Marino\WARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.



REVISIONS		
00	11/11/09	REPORT
01	12/09/09	REPORT REVISED

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AVON LANDFILL
100' LAMINATED
WOOD POLE

277 HUCKLEBERRY HILL ROAD
AVOON, CT 06011

PROJECT NO:	09127
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	11/12/09

TOWER & MAST
ELEVATION

EL-1

DWG. 1 OF 1

NATCOMM INC. CONSULTING ENGINEERS
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Subject:	Wind Loading
Location:	Avon Landfill Avon, CT
Rev. 0: 12/3/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09127

Design Wind Load on Other Structures: (Based on IBC 2003 and SEI/ASCE 7-02)

Wind Speed =	$V := 95$	mph	(User Input)	
Building Category =	$BC := II$		(User Input)	(Table 1-1)
Exposure Category =	$Exp := C$	(Conservative)	(User Input)	(Sec.6.5.6.3)
	Note: Actual exposure indicative of category B based on site specific surface roughness B)			
Structure Type =	$Structuretype := Square\_Chimney$		(User Input)	(Table 6-4)
Wind Speed with Ice =	$V_{ice} := 50$	mph	(User Input)	
Ice thickness =	$t := 1.0$	in	(User Input)	
Ice Density =	$Id := 56$	pcf	(User Input)	
Gust Response Factor =	$G := 0.89$		(User Input)	(NESC C2-2002 Table 250-3)

Importance Factor = (Table 6-1)

$$I := \begin{cases} 0.87 \text{ if } V \le 100 \text{ and } BC = I & = 1 \\ 0.77 \text{ if } V > 100 \text{ and } BC = I & \\ 1 \text{ if } BC = II & \\ 1.15 \text{ otherwise} & \end{cases}$$

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 6-2)

$$zg := \begin{cases} 1200 \text{ if } Exp = B & = 900 \\ 900 \text{ if } Exp = C & \\ 700 \text{ if } Exp = D & \end{cases}$$

3-Sec Gust Speed Power Law Exponent = (Table 6-2)

$$\alpha := \begin{cases} 7 \text{ if } Exp = B & = 9.5 \\ 9.5 \text{ if } Exp = C & \\ 11.5 \text{ if } Exp = D & \end{cases}$$

Topographic Factor =	$K_{zt} := 1$	(Eq. 6-3)
Wind Directionality Factor =	$K_d = 0.9$	(Table 6-4)

Importance Factor on Ice Thickness = (Table 10-1)

$$I_i := \begin{cases} 0.8 \text{ if } BC = 1 & = 1 \\ 1.0 \text{ if } BC = 2 & \\ 1.25 \text{ otherwise} & \end{cases}$$

Importance Factor on Concurrent Wind Pressure = $I_w := 1.0$ (Table 10-1)

Height Above Grade = $Z := 100$ ft

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$ (Table 6-3)

$K_z = 1.266$

Velocity Pressure = $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I = 26.32$ psf (Eq. 6-15)

Velocity Pressure with Ice = $q_{z.ice} := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V_{ice}^{\ 2} \cdot I_w = 7.29$ psf (Eq. 6-15)

Height Above Grade = $Z_{att} := 90$ ft

Exposure Coefficient = $K_{z.att} := \begin{cases} 2.01\left(\frac{Z_{att}}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z_{att} \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z_{att} < 15 \end{cases}$ (Table 6-3)

$K_{z.att} = 1.238$

Velocity Pressure = $q_{z.att} := 0.00256 \cdot K_{z.att} \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I = 25.74$ psf (Eq. 6-15)

Velocity Pressure with Ice = $q_{z.ice.att} := 0.00256 \cdot K_{z.att} \cdot K_{zt} \cdot K_d \cdot V_{ice}^{\ 2} \cdot I_w = 7.13$ psf (Eq. 6-15)

Height Above Grade = $Z_{pocket} := 80$ ft

Exposure Coefficient = $K_{z.pocket} := \begin{cases} 2.01\left(\frac{Z_{pocket}}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z_{pocket} \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z_{pocket} < 15 \end{cases}$ (Table 6-3)

$K_{z.pocket} = 1.208$

Velocity Pressure = $q_{z.pocket} := 0.00256 \cdot K_{z.pocket} \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I = 25.11$ psf (Eq. 6-15)

Velocity Pressure with Ice = $q_{z.ice.pocket} := 0.00256 \cdot K_{z.pocket} \cdot K_{zt} \cdot K_d \cdot V_{ice}^{\ 2} \cdot I_w = 6.96$ psf (Eq. 6-15)

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Subject:	Wind Loading
Location:	Avon Landfill Avon, CT
Rev. 0: 12/3/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09127

Development of Wind & Ice Load on Laminated Pole

Laminated Pole Data: Longitudinal Direction

Pole Shape =	Flat	
Pole Width Top =	$W_{pole.top} := 12$ in	
Pole Width Bottom =	$W_{pole.bot} := 30.25$ in	
Pole Length =	$L_{pole} := 100$ ft	
Pole Weight =	$Weight_{pole} := 42$ pcf	
Force Coefficient =	$C_f := 2.0$	(Fig 6-19)

Wind Load (without ice)

Pole Projected Surface Area = $A_{pole} := \frac{W_{pole.top}}{12} = 1$ sf/ft

Total Pole Wind Force = $q_z \cdot G \cdot C_f \cdot A_{pole} = 47$ plf **BLC 6,7**

Pole Projected Surface Area = $A_{pole} := \frac{W_{pole.bot}}{12} = 2.521$ sf/ft

Total Pole Wind Force = $q_z \cdot G \cdot C_f \cdot A_{pole} = 118$ plf **BLC 6,7**

Wind Load (with ice)

Pole Projected Surface Area w/ Ice = $AICE_{pole} := \frac{(W_{pole.top} + 2 \cdot t)}{12} = 1.167$ sf/ft

Total Pole Wind Force w/ Ice = $q_{z.ice} \cdot G \cdot C_f \cdot AICE_{pole} = 15$ plf **BLC 5**

Pole Projected Surface Area w/ Ice = $AICE_{pole} := \frac{(W_{pole.bot} + 2 \cdot t)}{12} = 2.688$ sf/ft

Total Pole Wind Force w/ Ice = $q_{z.ice} \cdot G \cdot C_f \cdot AICE_{pole} = 35$ plf **BLC 5**

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Subject: Wind Loading

Location: Avon Landfill, Avon, CT

Rev. 0: 12/3/09

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 09127

Development of Wind & Ice Load on Laminated Pole

Laminated Pole Data: Transverse Direction

Pole Shape = Flat

Pole Width = $W_{pole} := 26.25$ in

Pole Length = $L_{pole} := 100$ ft

Force Coefficient = $C_f := 2.0$ (Fig 6-19)

Wind Load (without ice)

Pole Projected Surface Area = $A_{pole} := \frac{W_{pole}}{12} = 2.188$ sf/ft

Total Pole Wind Force = $q_z \cdot G \cdot C_f A_{pole} = 102$ plf **BLC 4**

Wind Load (with ice)

Pole Projected Surface Area w/ Ice = $AICE_{pole} := \frac{(W_{pole} + 2 \cdot t)}{12} = 2.354$ sf/ft

Total Pole Wind Force w/ Ice = $q_{z.ice} \cdot G \cdot C_f AICE_{pole} = 31$ plf **BLC 3**

Gravity Loads (without ice)

Cross Sectional Area Top = $Area_{top} := W_{pole.top} \cdot W_{pole} = 315$ sq in

Weight of the Pole Top = $Weight_{pole} \cdot \frac{Area_{top}}{144} = 92$ plf **BLC 1**

Cross Sectional Area Bottom = $Area_{bot} := W_{pole.bot} \cdot W_{pole} = 794.063$ sq in

Weight of the Pole Bottom = $Weight_{pole} \cdot \frac{Area_{bot}}{144} = 232$ plf **BLC 1**

Gravity Loads (ice only)

Cross Sectional Area with Ice Top = $Area_{tot.top} := (W_{pole.top} + 2 \cdot t) \cdot (W_{pole} + 2 \cdot t) = 395.5$ sq in

Cross Sectional Area Ice Only Top = $Area_{ice.top} := Area_{tot.top} - Area_{top} = 80.5$ sq in

Weight of Ice on Pole Top = $\frac{Area_{ice.top}}{144} \cdot Id = 31$ plf **BLC 2**

Cross Sectional Area with Ice Bottom = $Area_{tot.bot} := (W_{pole.bot} + 2 \cdot t) \cdot (W_{pole} + 2 \cdot t) = 911.063$ sq in

Cross Sectional Area Ice Only Bottom = $Area_{ice.bot} := Area_{tot.bot} - Area_{bot} = 117$ sq in

Weight of Ice on Pole Bottom = $\frac{Area_{ice.bot}}{144} \cdot Id = 46$ plf **BLC 2**

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Subject:	Wind Loading
Location:	Avon Landfill Avon, CT
Rev. 0: 12/3/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09127

Development of Wind & Ice Load on Antennas

Antenna Data: Sprint

Antenna Model =	EMS RR90-17-00DP		
Antenna Shape =	Flat		
Antenna Height =	$L_{ant} := 56$	in	
Antenna Width =	$W_{ant} := 8$	in	
Antenna Thickness =	$T_{ant} := 2.75$	in	
Antenna Weight =	$WT_{ant} := 13.5$	lbs	
Number of Antennas =	$N_{ant} := 3$		
Force Coefficient =	$C_f = 1.4$		(Fig 6-19)

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 9.3$	sf	
Total Antenna Wind Force =	$F_{ant} := q_z \cdot G \cdot C_f \cdot A_{ant} = 306$	lbs	**BLC 4,6,7**

Wind Load (with ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t) \cdot (W_{ant} + 2 \cdot t)}{144} = 4$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 12.1$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := q_{z.ice} \cdot G \cdot C_f \cdot A_{ICEant} = 110$	lbs	**BLC 3,5**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 41$	lbs	**BLC 1**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1232$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t)(W_{ant} + 2 \cdot t) \cdot (T_{ant} + 2 \cdot t) - V_{ant} = 1523$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 49$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 148$	lbs	**BLC 2**

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Development of Wind & Ice Load on Antennas

Antenna Data: AT&T

Antenna Model =	Powerwave 7770		
Antenna Shape =	Flat		
Antenna Height =	$L_{ant} := 55$	in	
Antenna Width =	$W_{ant} := 11$	in	
Antenna Thickness =	$T_{ant} := 5$	in	
Antenna Weight =	$WT_{ant} := 35$	lbs	
Number of Antennas =	$N_{ant} := 3$		
Force Coefficient =	$C_f = 1.367$		(Fig 6-19)

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := q_{z.att} \cdot G \cdot C_f \cdot A_{ant} = 395$	lbs	**BLC 4,6,7**

Wind Load (with ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t) \cdot (W_{ant} + 2 \cdot t)}{144} = 5.1$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 15.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := q_{z.ice.att} \cdot G \cdot C_f \cdot A_{ICEant} = 134$	lbs	**BLC 3,5**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 105$	lbs	**BLC 1**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t)(W_{ant} + 2 \cdot t) \cdot (T_{ant} + 2 \cdot t) - V_{ant} = 2162$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 70$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 210$	lbs	**BLC 2**

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Subject: Wind Loading

Location: Avon Landfill
Avon, CT

Rev. 0: 12/3/09

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 09127

Development of Wind & Ice Load on TMA's

TMA Data: AT&T

TMA Model = Powerwave LGP-214

TMA Shape = Flat

TMA Height = $L_{TMA} := 9.2$ in

TMA Width = $W_{TMA} := 14.1$ in

TMA Thickness = $T_{TMA} := 2.6$ in

TMA Weight = $WT_{TMA} := 14.1$ lbs

Number of TMA's = $N_{TMA} := 6$

Force Coefficient = $C_f = 1.3$ (Fig 6-19)

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.4$ sf

Total TMA Wind Force = $F_{TMA} := q_{z.att} \cdot G \cdot C_f \cdot A_{TMA} = 161$ lbs **BLC 4,6,7**

Wind Load (with ice)

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 2 \cdot t) \cdot (W_{TMA} + 2 \cdot t)}{144} = 1.3$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 7.5$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := q_{z.ice.att} \cdot G \cdot C_f \cdot A_{ICETMA} = 62$ lbs **BLC 3,5**

Gravity Load (without ice)

Weight of All TMA's = $WT_{TMA} \cdot N_{TMA} = 85$ lbs **BLC 1**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 337$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 2 \cdot t)(W_{TMA} + 2 \cdot t)(T_{TMA} + 2 \cdot t) - V_{TMA} = 492$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 16$ lbs

Weight of Ice on All TMA's = $W_{ICETMA} \cdot N_{TMA} = 96$ lbs **BLC 2**

Development of Wind & Ice Load on Antennas

Antenna Data: Pocket

Antenna Model =	RFS APX18-206517		
Antenna Shape =	Flat		
Antenna Height =	$L_{ant} := 72.44$	in	
Antenna Width =	$W_{ant} := 6.65$	in	
Antenna Thickness =	$T_{ant} := 3.15$	in	
Antenna Weight =	$WT_{ant} := 24.2$	lbs	
Number of Antennas =	$N_{ant} := 3$		
Force Coefficient =	$C_f = 1.53$		(Fig 6-19)

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.3$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 10$	sf	
Total Antenna Wind Force =	$F_{ant} := q_{z.pocket} \cdot G \cdot C_f \cdot A_{ant} = 343$	lbs	**BLC 4,6,7**

Wind Load (with ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t) \cdot (W_{ant} + 2 \cdot t)}{144} = 4.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 13.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := q_{z.ice.pocket} \cdot G \cdot C_f \cdot A_{ICEant} = 127$	lbs	**BLC 3,5**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 73$	lbs	**BLC 1**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1517$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t)(W_{ant} + 2 \cdot t) \cdot (T_{ant} + 2 \cdot t) - V_{ant} = 1799$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 58$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 175$	lbs	**BLC 2**

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63-2 N. Branford Rd., Branford, CT 06405

Subject:	Wind Loading
Location:	Avon Landfill Avon, CT
Rev. 0: 12/3/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09127

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	GPS			
Antenna Shape =	Round			
Antenna Height =	$L_{ant} := 24$	in		
Antenna Width =	$W_{ant} := 2$	in		
Antenna Thickness =	$T_{ant} := 2$	in		
Antenna Weight =	$WT_{ant} := 10$	lbs		
Number of Antennas =	$N_{ant} := 1$			
Force Coefficient =	$C_f = 0.91$		(Fig 6-19)	

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.3$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.3$	sf	
Total Antenna Wind Force =	$F_{ant} := q_z \cdot G \cdot C_f \cdot A_{ant} = 7$	lbs	**BLC 4,6,7**

Wind Load (with ice)

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t) \cdot (W_{ant} + 2 \cdot t)}{144} = 0.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := q_{z.ice} \cdot G \cdot C_f \cdot A_{ICEant} = 4$	lbs	**BLC 3,5**

Gravity Load (without ice)

Weight of All Antennas =	$WT := 10$	lbs	**BLC 1**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 96$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t)(W_{ant} + 2 \cdot t) \cdot (T_{ant} + 2 \cdot t) - V_{ant} = 320$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 10$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 10$	lbs	**BLC 2**

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Subject: Wind Loading

Location: Avon Landfill, Avon, CT

Rev. 0: 12/3/09

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 09127

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: Transverse Direction

Coax Type:	Use HELIAX 1-5/8"		
Shape:	Flat		
Coax Outside Diameter =	$D_{coax} := 1.98$	in	
Coax Cable Length =	$L_{coax} := 100$	ft	
Weight of Coax per foot =	$WT_{coax} := 1.04$	plf	
Total Number of Coax =	$N_{coax} := 30$		
No. of Coax Projecting Outside Face Pole =	$NP_{coax} := 2$		
Force Coefficient =	$C_f := 2.0$	(Conservative Actual Cf = 1.2)	(Fig 6-19)

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} \cdot D_{coax})}{12} = 0.33$ sf/ft

Coax Wind Force = $F_{coax} := q_z \cdot G \cdot C_f \cdot A_{coax} = 15$ plf **BLC 4**

Wind Load (with ice)

Coax projected surface area = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot t)}{12} = 0.5$ sf/ft

Coax Wind Force = $Fi_{coax} := q_{z.ice} \cdot G \cdot C_f \cdot AICE_{coax} = 6$ plf **BLC 3**

Gravity Loads (without ice)

Weight of all cables w/o ice = $WT_{coax} \cdot N_{coax} = 31$ plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t)^2 - D_{coax}^2\right] = 9.36$ in^2

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \frac{Ai_{coax}}{144} \cdot N_{coax} = 109$ plf **BLC 2**

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Subject:	Wind Loading
Location:	Avon Landfill Avon, CT
Rev. 0: 12/3/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09127

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: Longitudinal Direction

Coax Type: Use HELIAX 1-5/8"

Shape: Flat

Coax Outside Diameter = $D_{coax} := 1.98$ in

Coax Cable Length = $L_{coax} := 100$ ft

No. of Coax Projecting Outside Face of Pole = $NP_{coax} := 3$

Force Coefficient = $C_f := 2.0$ (Conservative Actual Cf = 1.2) (Fig 6-19)

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} \cdot D_{coax})}{12} = 0.5$ sf/ft

Coax Wind Force = $F_{coax} := q_z \cdot G \cdot C_f \cdot A_{coax} = 23$ plf **BLC 6**

Wind Load (with ice)

Coax projected surface area = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot t)}{12} = 0.66$ sf/ft

Coax Wind Force = $Fi_{coax} := q_{z.ice} \cdot G \cdot C_f \cdot AICE_{coax} = 9$ plf **BLC 5**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: Longitudinal Direction

Coax Type 1: Use HELIAX 1-5/8"

Coax Type 2: Use HELIAX 7/8"

Shape: Flat

Coax Outside Diameter = $D_{coax1} := 1.98$ in

Coax Outside Diameter = $D_{coax2} := 1.11$ in

Coax Cable Length = $L_{coax} := 100$ ft

No. of Coax Projecting Outside Face of Pole = $NP_{coax1} := 2$

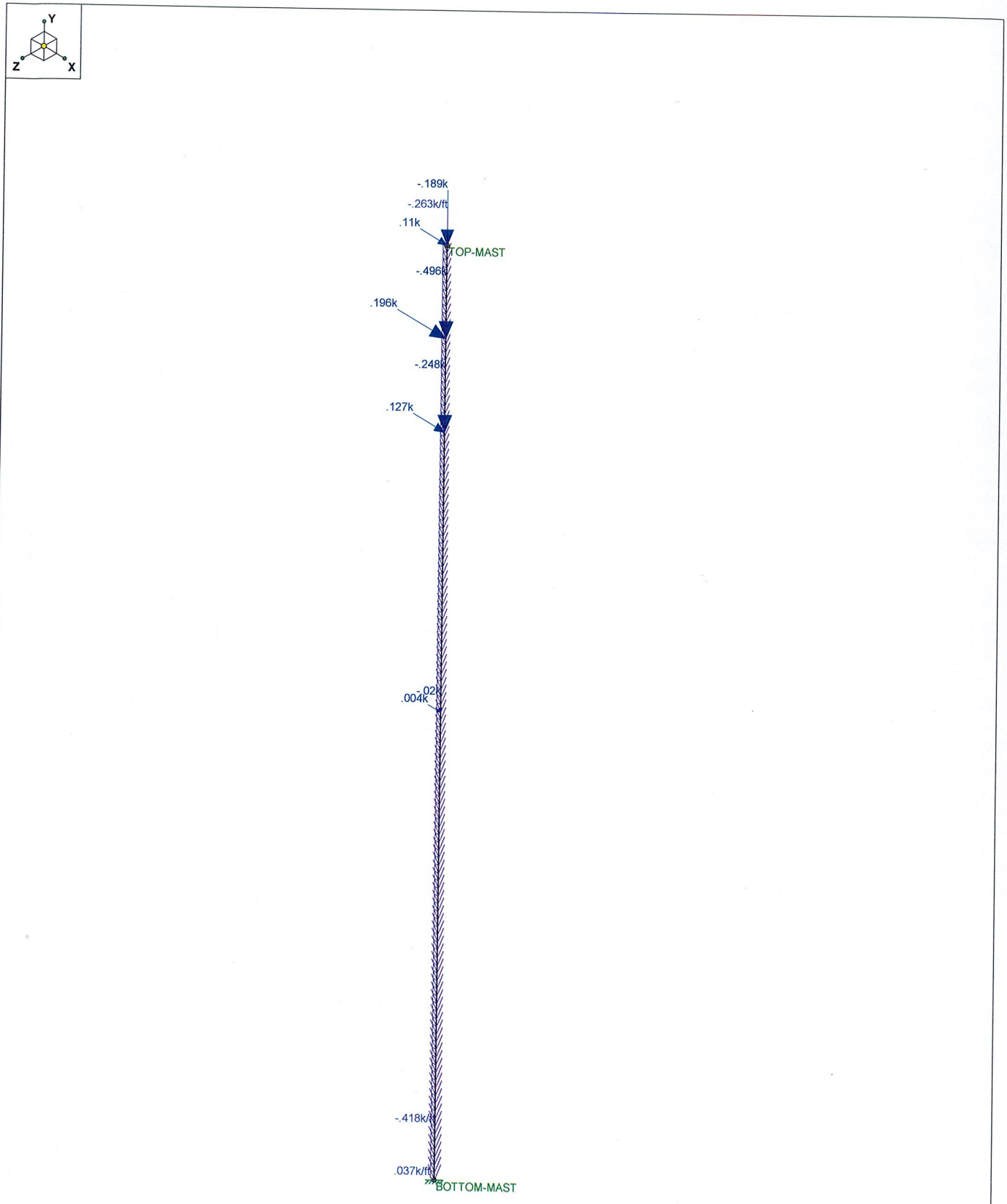
No. of Coax Projecting Outside Face of Pole = $NP_{coax2} := 1$

Force Coefficient = $C_f := 2.0$ (Conservative Actual Cf = 1.2) (Fig 6-19)

Wind Load (without ice)

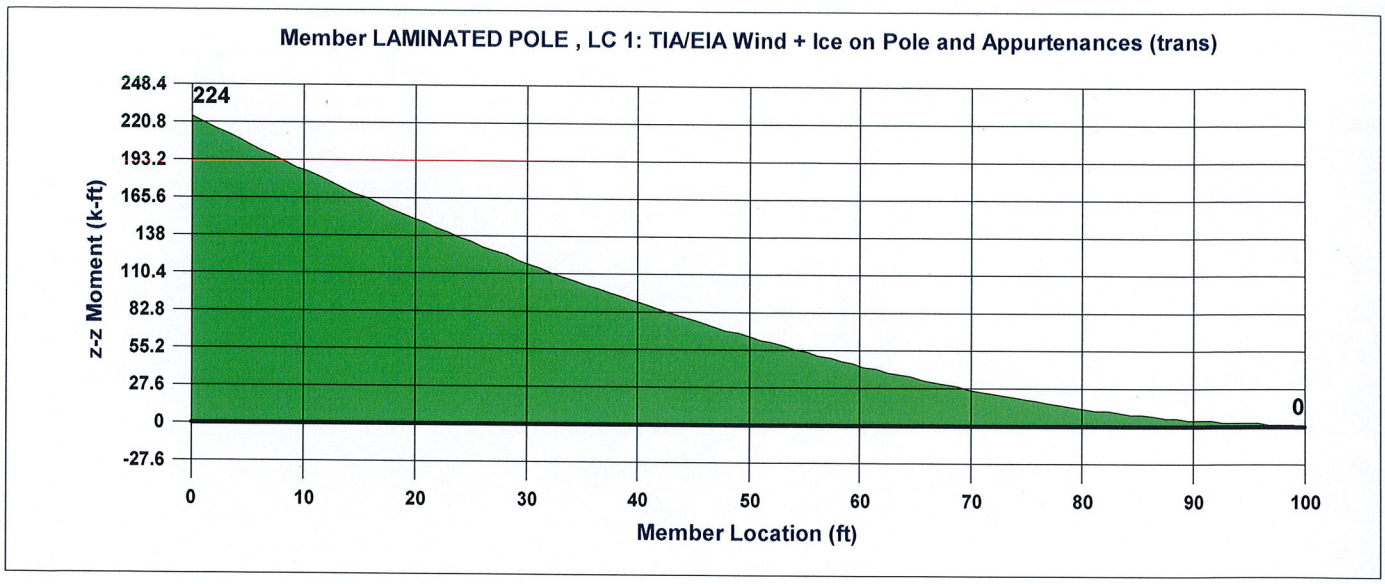
Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax1} \cdot D_{coax1} + NP_{coax2} \cdot D_{coax2}\right)}{12} = 0.42$ sf/ft

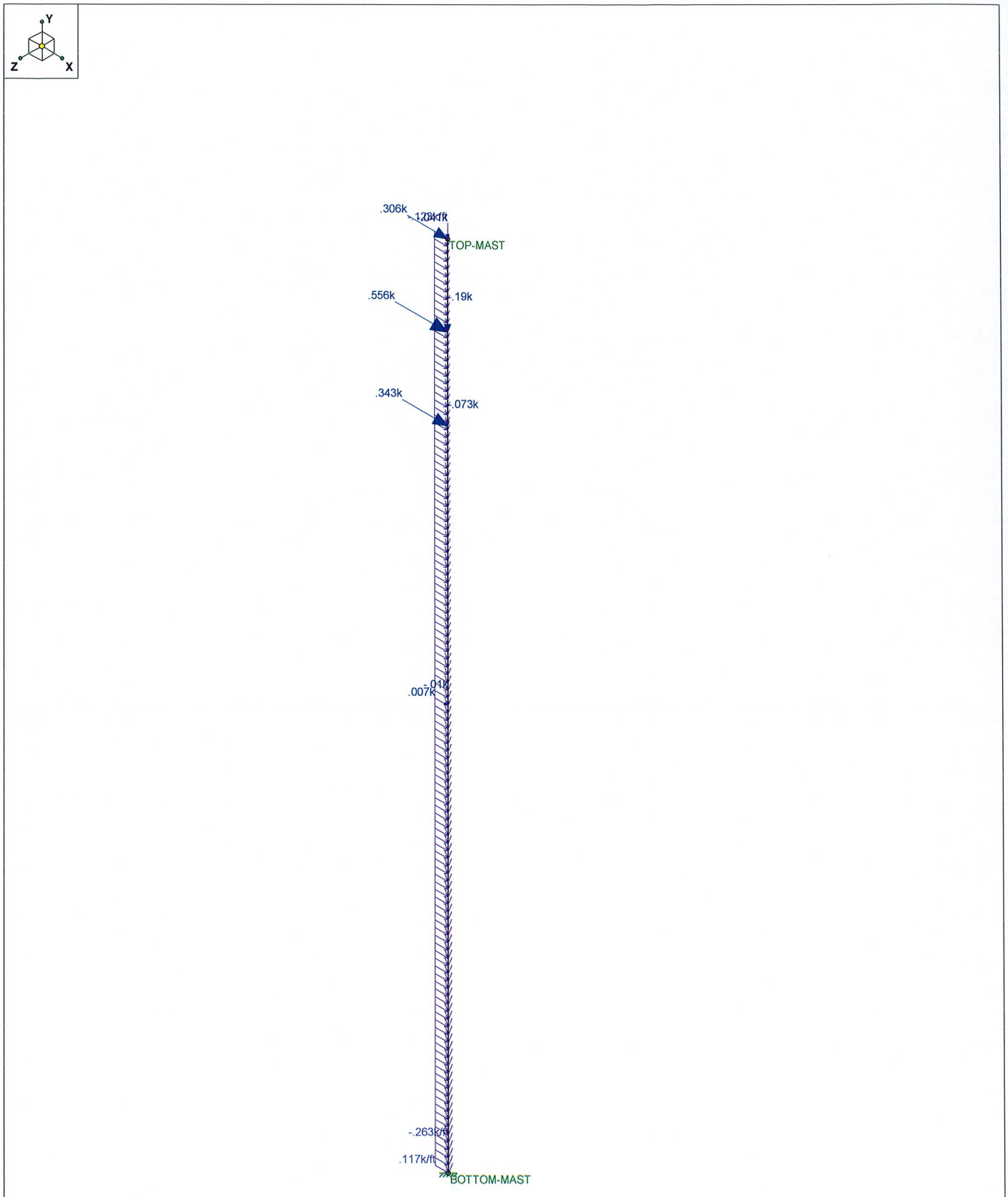
Coax Wind Force = $F_{coax} := q_z \cdot G \cdot C_f \cdot A_{coax} = 20$ plf **BLC 7**



Loads: LC 1, TIA/EIA Wind + Ice on Pole and Appurtenances (trans)

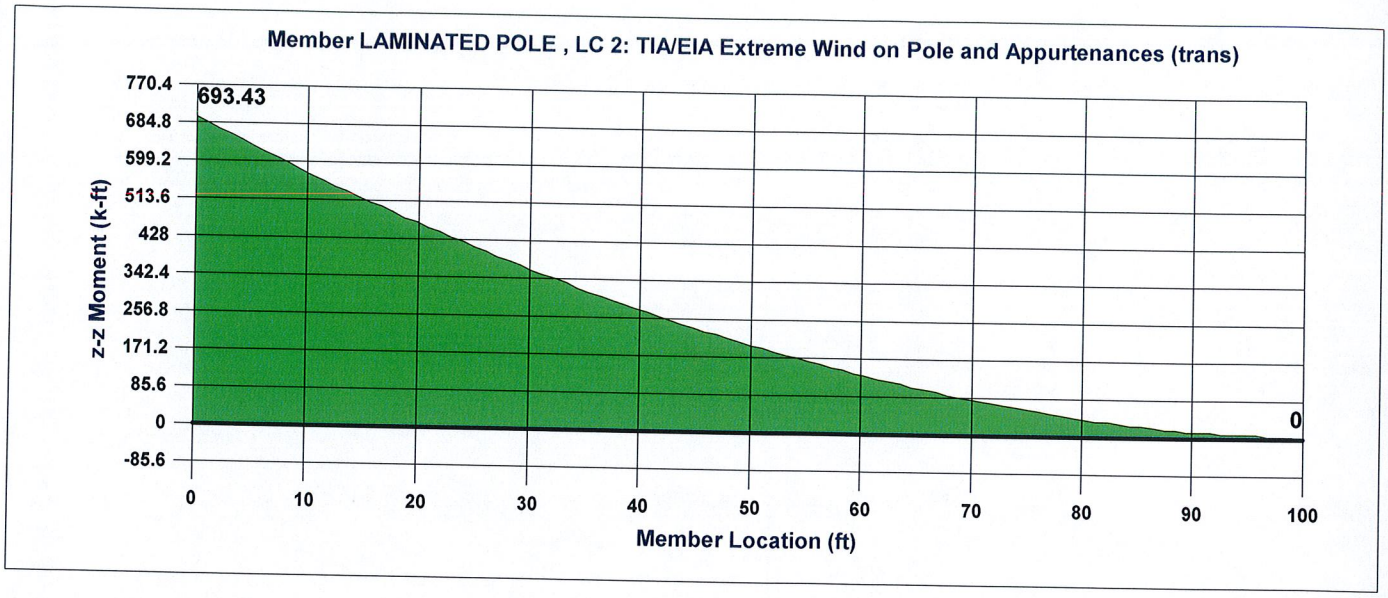
Natcomm, INC.	Avon Landfill	
tjl, cfc		Dec 4, 2009 at 12:15 PM
09127	LC # 1 Loads	EIA-TIA.r3d

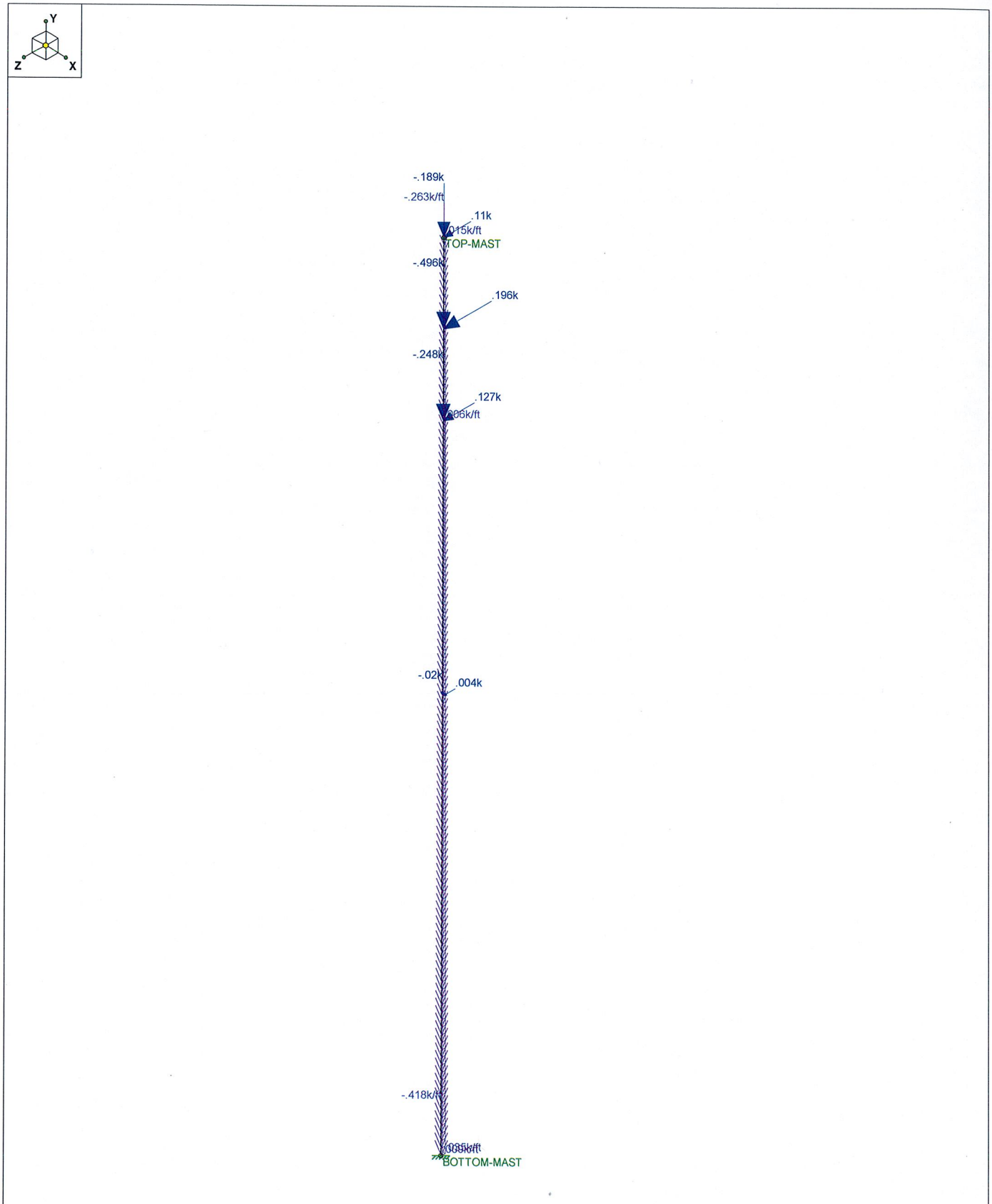

Member LAMINATED POLE , LC 1: TIA/EIA Wind + Ice on Pole and Appurtenances (trans)
z-z Moment (k-ft)
248.4
220.8
193.2
165.6
138
110.4
82.8
55.2
27.6
0
-27.6
224
0
0
10
20
30
40
50
60
70
80
90
100
Member Location (ft)



Loads: LC 2, TIA/EIA Extreme Wind on Pole and Appurtenances (trans)

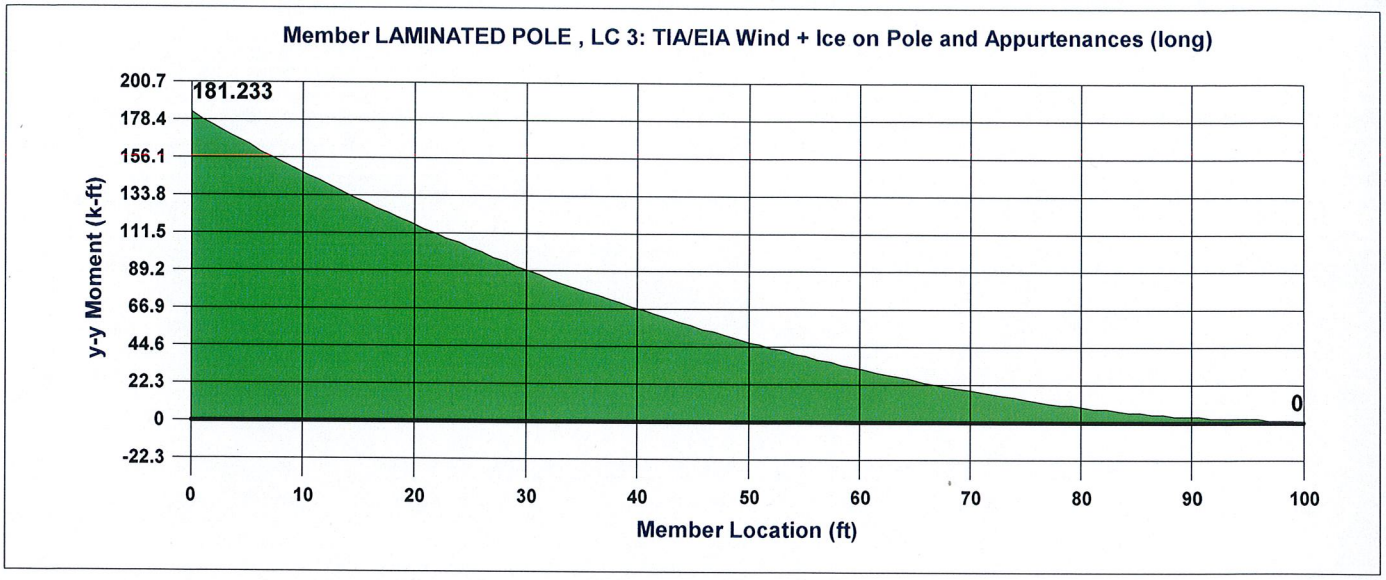
Natcomm, INC.	Avon Landfill	
tjl, cfc		Dec 4, 2009 at 12:15 PM
09127	LC # 2 Loads	EIA-TIA.r3d

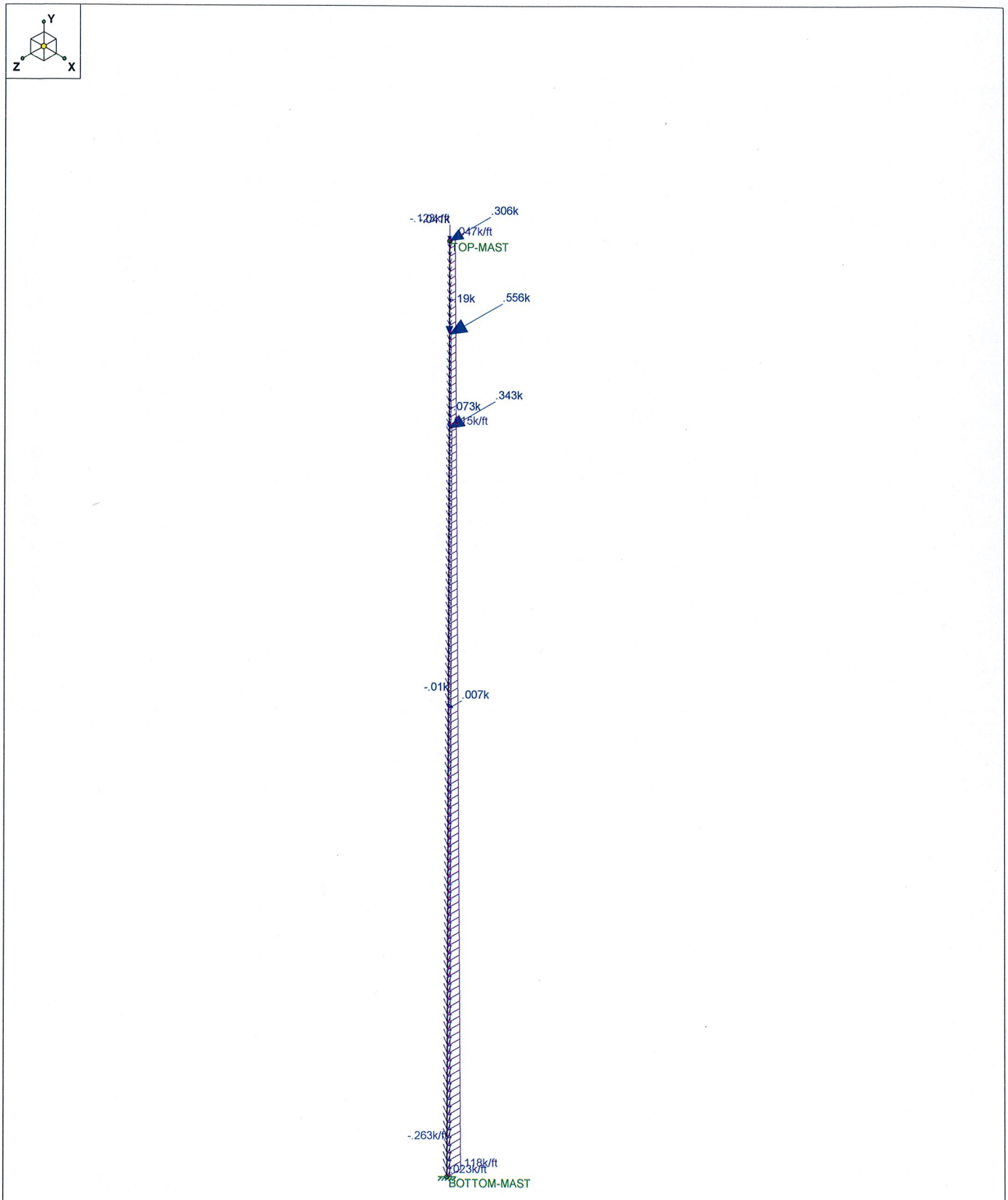

Member LAMINATED POLE , LC 2: TIA/EIA Extreme Wind on Pole and Appurtenances (trans)
770.4
684.8
599.2
513.6
428
342.4
256.8
171.2
85.6
0
-85.6
z-z Moment (k-ft)
693.43
0
0
10
20
30
40
50
60
70
80
90
100
Member Location (ft)



Loads: LC 3, TIA/EIA Wind + Ice on Pole and Appurtenances (long)

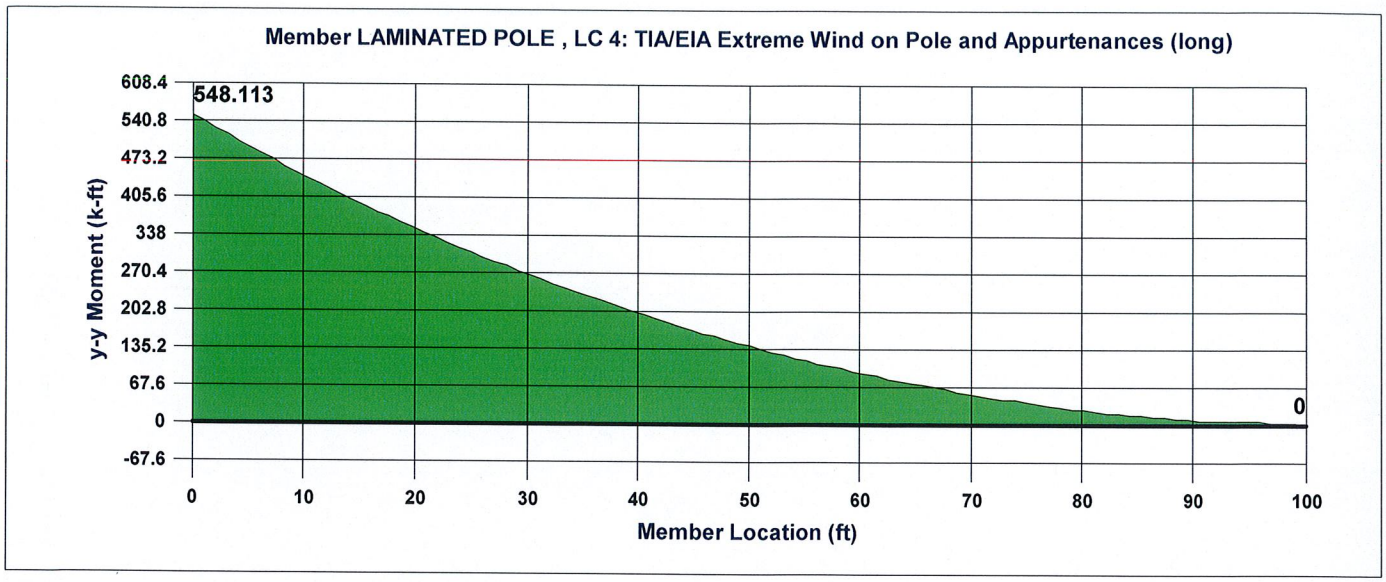
Natcomm, INC.	Avon Landfill	
tjl, cfc		Dec 4, 2009 at 12:16 PM
09127	LC # 3 Loads	EIA-TIA.r3d

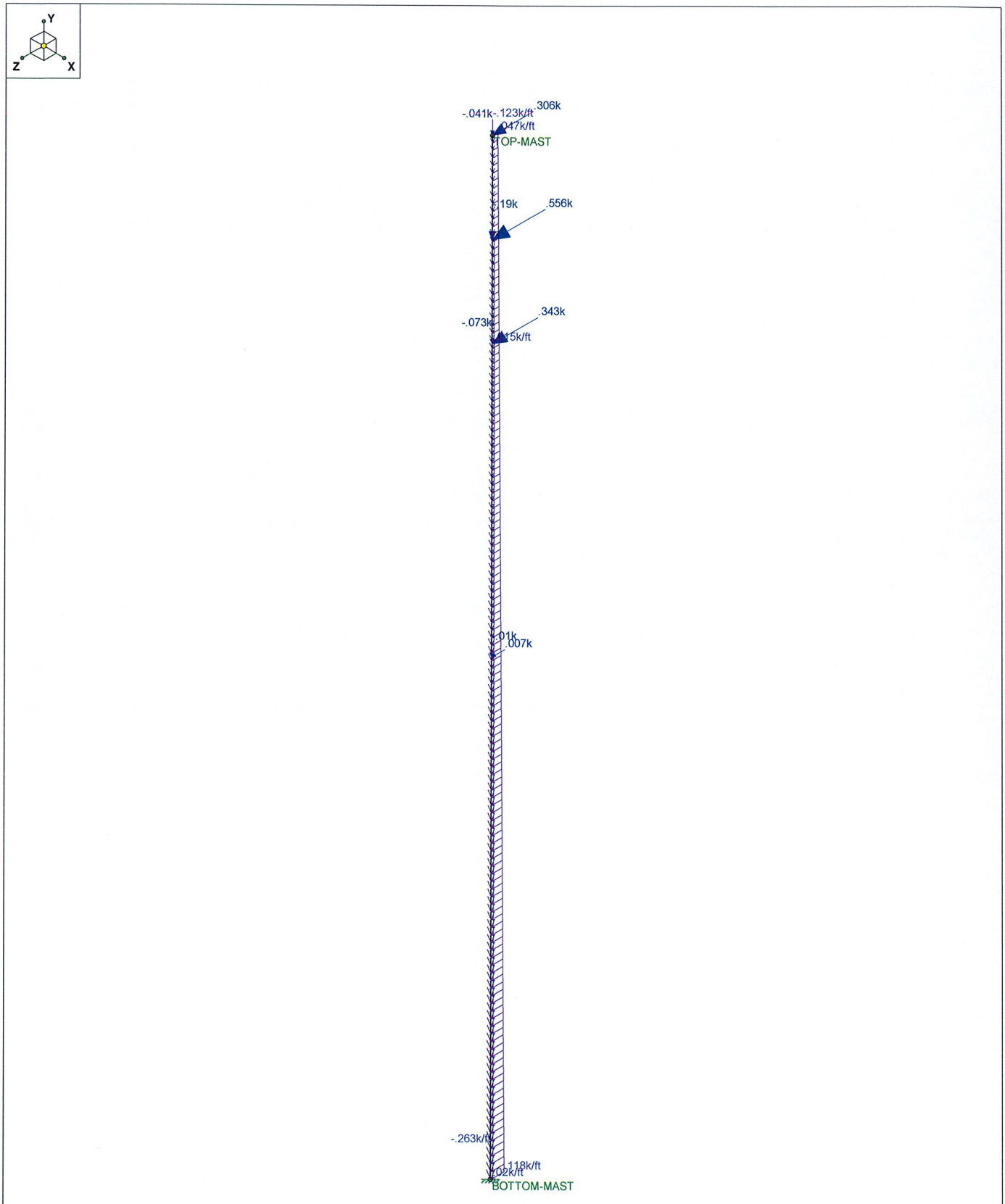

Member LAMINATED POLE , LC 3: TIA/EIA Wind + Ice on Pole and Appurtenances (long)
y-y Moment (k-ft)
200.7
178.4
156.1
133.8
111.5
89.2
66.9
44.6
22.3
0
-22.3
181.233
0
0
10
20
30
40
50
60
70
80
90
100
Member Location (ft)



Loads: LC 4, TIA/EIA Extreme Wind on Pole and Appurtenances (long)

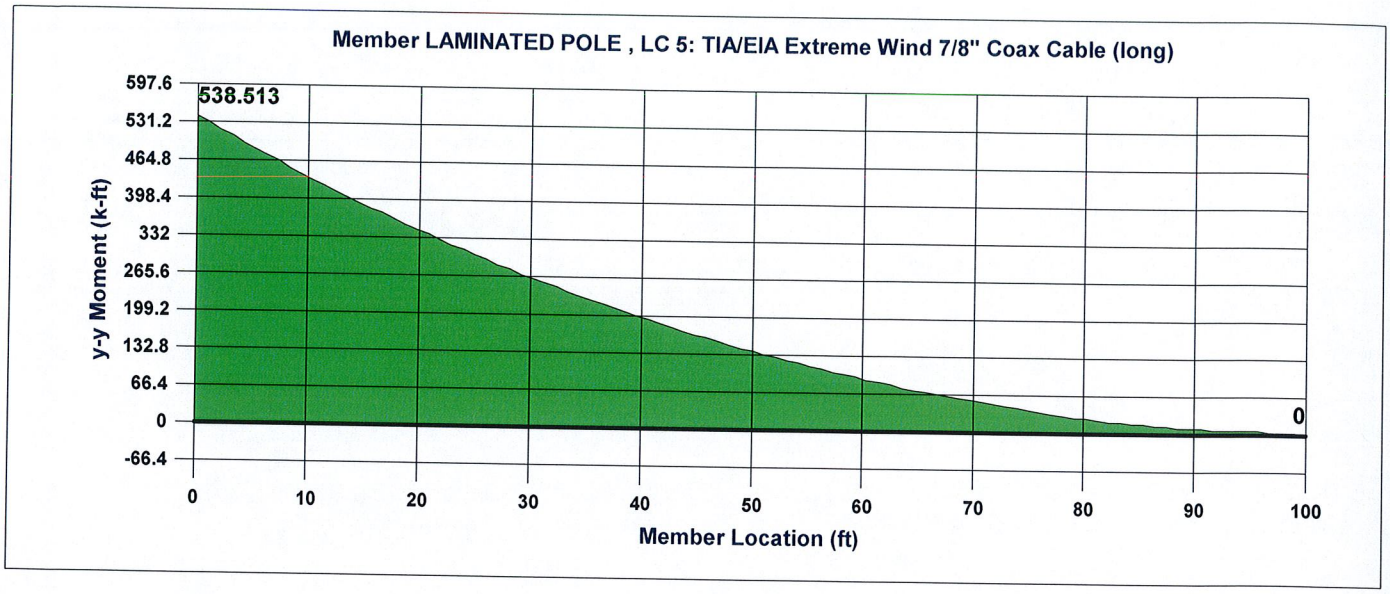
Natcomm, INC.	Avon Landfill	
tjl, cfc		Dec 4, 2009 at 12:16 PM
09127	LC # 4 Loads	EIA-TIA.r3d


Member LAMINATED POLE , LC 4: TIA/EIA Extreme Wind on Pole and Appurtenances (long)
608.4
540.8
473.2
405.6
338
270.4
202.8
135.2
67.6
0
-67.6
y-y Moment (k-ft)
548.113
0
0
10
20
30
40
50
60
70
80
90
100
Member Location (ft)



Loads: LC 5, TIA/EIA Extreme Wind 7/8" Coax Cable (long)

Natcomm, INC.	Avon Landfill	
tjl, cfc		Dec 7, 2009 at 8:59 AM
09127	LC # 5 Loads	EIA-TIA.r3d


Member LAMINATED POLE , LC 5: TIA/EIA Extreme Wind 7/8" Coax Cable (long)
y-y Moment (k-ft)
597.6
531.2
464.8
398.4
332
265.6
199.2
132.8
66.4
0
-66.4
538.513
0
0
10
20
30
40
50
60
70
80
90
100
Member Location (ft)

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63-2 N. Branford Rd., Branford, CT 06405

Subject:	Laminated Pole Analysis
Location:	Avon Landfill Avon, CT
Rev. 0: 12/4/09	Prepared by: T.J.L Checked by: C.F.C. Job No. 09127

Laminated Pole Analysis:

Pole Properties:

Pole Width Transverse Direction Top =	$W_{trans.top} := 26.25 \cdot in$	(User Input)
Pole Width Transverse Direction Bottom =	$W_{trans.bot} := 26.25 \cdot in$	(User Input)
Pole Width Longitudinal Direction Top =	$W_{long.top} := 12.0 \cdot in$	(User Input)
Pole Width Longitudinal Direction Top =	$W_{long.bot} := 30.25 \cdot in$	(User Input)
Length of Pole =	$L_{pole} := 100 \cdot ft$	(User Input)
Max Allowable Bending Stress Transverse Direction =	$F_{b.trans} := 2400 \cdot psi$	(LWS Design Documents 7/28/05)
Max Allowable Bending Stress Longitudinal Direction =	$F_{b.long} := 1750 \cdot psi$	(LWS Design Documents 7/28/05)
Adjustment Factors:		
Volume Reduction Factor =	$CV := 0.814$	(N.D.S. 2001 Pg.34)
Load Duration Factor =	$Cd := 1.6$	(N.D.S. 2001 Pg.9 Tbl. 2.3.2)
Flat Use Factor =	$Cfu := 0.92$	(N.D.S. 2001 Sup.)
Wet Use Factor =	$Cw := 0.8$	(N.D.S. 2001 Pg.63 Tbl. 5B)
Allowable Bending Stress Transverse Direction =	$F_{b.trans} := 2400 \cdot psi \cdot CV \cdot Cd \cdot Cw = 2501 psi$	
Allowable Bending Stress Longitudinal Direction =	$F_{b.long} := 1750 \cdot psi \cdot Cfu \cdot Cd \cdot Cw = 2061 psi$	
Section Modulus trans-direction Top =	$S_{trans.top} := \frac{W_{trans.top} \cdot W_{long.top}^2}{6} = 630 \cdot in^3$	
Section Modulus trans-direction Bottom =	$S_{trans.bot} := \frac{W_{trans.bot} \cdot W_{long.bot}^2}{6} = 4003 \cdot in^3$	
Section Modulus long-direction Top =	$S_{long.top} := \frac{W_{long.top} \cdot W_{trans.top}^2}{6} = 1378 \cdot in^3$	
Section Modulus long-direction Bottom =	$S_{long.bot} := \frac{W_{long.bot} \cdot W_{trans.bot}^2}{6} = 3474 \cdot in^3$	

Bending Moments:

Bending Moment trans-direction Top =	$M_{trans.top} := 0 \cdot kip \cdot ft$	(User Input from RISA-3D)
Bending Moment trans-direction Bottom =	$M_{trans.bot} := 694 \cdot kip \cdot ft$	(User Input from RISA-3D)
Bending Moment long-direction Top =	$M_{long.top} := 0 \cdot kip \cdot ft$	(User Input from RISA-3D)
Bending Moment long-direction Bottom =	$M_{long.bot} := 549 kip \cdot ft$	(User Input from RISA-3D)

Distance Above Ground Level =

$$d_i := \begin{pmatrix} 100\cdot ft \\ 95\cdot ft \\ 90\cdot ft \\ 85\cdot ft \\ 80\cdot ft \\ 75\cdot ft \\ 70\cdot ft \\ 65\cdot ft \\ 60\cdot ft \\ 55\cdot ft \\ 50\cdot ft \\ 45\cdot ft \\ 40\cdot ft \\ 35\cdot ft \\ 30\cdot ft \\ 25\cdot ft \\ 20\cdot ft \\ 15\cdot ft \\ 10\cdot ft \\ 5\cdot ft \\ 0\cdot ft \end{pmatrix}$$

Section Modulus trans-direction @ 5' Increments =

$$S_{xi} := S_{trans.bot} - \frac{\left(S_{trans.bot} - S_{trans.top}\right)}{L_{pole}} \cdot d_i$$

Section Modulus long-direction @ 5' Increments =

$$S_{yi} := S_{long.bot} - \frac{\left(S_{long.bot} - S_{long.top}\right)}{L_{pole}} \cdot d_i$$

Bending Moment x-direction @ 5' Increments =

$$M_{xi} := M_{trans.bot} - \frac{\left(M_{trans.bot} - M_{trans.top}\right)}{L_{pole}} \cdot d_i$$

Bending Moment y-direction @ 5' Increments =

$$M_{yi} := M_{long.bot} - \frac{\left(M_{long.bot} - M_{long.top}\right)}{L_{pole}} \cdot d_i$$

S_{xi} =

	0
0	630
1	798.7
2	967.3
3	1136
4	1304.7
5	1473.3
6	1642
7	1810.7
8	1979.4
9	2148
10	2316.7
11	2485.4
12	2654
13	2822.7
14	2991.4
15	3160
16	3328.7
17	3497.4
18	3666.1
19	3834.7
20	4003.4

$\cdot in^3$

S_{yi} =

	0
0	1378.1
1	1482.9
2	1587.7
3	1692.5
4	1797.3
5	1902.1
6	2006.9
7	2111.7
8	2216.5
9	2321.3
10	2426.1
11	2530.9
12	2635.7
13	2740.5
14	2845.3
15	2950
16	3054.8
17	3159.6
18	3264.4
19	3369.2
20	3474

$\cdot in^3$

M_{xi} =

	0
0	0
1	35
2	69
3	104
4	139
5	174
6	208
7	243
8	278
9	312
10	347
11	382
12	416
13	451
14	486
15	521
16	555
17	590
18	625
19	659
20	694

$\cdot kip \cdot ft$

M_{yi} =

	0
0	0
1	27
2	55
3	82
4	110
5	137
6	165
7	192
8	220
9	247
10	275
11	302
12	329
13	357
14	384
15	412
16	439
17	467
18	494
19	522
20	549

$\cdot kip \cdot ft$

Bending Stress x-direction @ 5' Increments = $f_{bxi} := \frac{M_{xi}}{S_{xi}}$

Bending Stress y-direction @ 5' Increments = $f_{byi} := \frac{M_{yi}}{S_{yi}}$

$f_{bxi} =$

	0
0	0
1	521.4
2	860.9
3	1099.6
4	1276.6
5	1413.1
6	1521.5
7	1609.8
8	1683
9	1744.7
10	1797.4
11	1842.9
12	1882.7
13	1917.7
14	1948.8
15	1976.6
16	2001.5
17	2024
18	2044.5
19	2063.1
20	2080.2

·psi

$f_{byi} =$

	0
0	0
1	222.1
2	414.9
3	583.9
4	733.1
5	865.9
6	984.8
7	1091.9
8	1188.9
9	1277.1
10	1357.7
11	1431.7
12	1499.7
13	1562.6
14	1620.8
15	1674.9
16	1725.3
17	1772.3
18	1816.3
19	1857.6
20	1896.4

·psi

Maximum Bending Stress trans-direction = $f_{b.trans.max} := 2080.2 \cdot psi$

Percent Stressed = $\frac{f_{b.trans.max}}{F_{b.trans}} = 83.2 \cdot \%$

$Bending\_Check\_trans := if(f_{b.trans.max} < F_{b.trans}, "OK", "NG")$

Bending_Check_trans = "OK"

Maximum Bending Stress y-direction = $f_{b.long.max} := 1896.4 \cdot psi$

Percent Stressed = $\frac{f_{b.long.max}}{F_{b.long}} = 92.0 \cdot \%$

$Bending\_Check\_long := if(f_{b.long.max} < F_{b.long}, "OK", "NG")$

Bending_Check_long = "OK"

Check Pole with 7/8" Φ Cables Used for Pocket:

Bending Moment long-direction Top = $M_{long.top} := 0 \cdot kip \cdot ft$ (User Input from RISA-3D)

Bending Moment long-direction Bottom = $M_{long.bot} := 539 kip \cdot ft$ (User Input from RISA-3D)

Bending Moment y-direction @ 5' Increments = $M_{yi} := M_{long.bot} - \frac{(M_{long.bot} - M_{long.top})}{L_{pole}} \cdot d_i$

$M_{yi} =$

	0
0	0
1	27
2	54
3	81
4	108
5	135
6	162
7	189
8	216
9	243
10	270
11	296
12	323
13	350
14	377
15	404
16	431
17	458
18	485
19	512
20	539

$\cdot kip \cdot ft$

Bending Stress y-direction @ 5' Increments = $f_{byi} := \frac{M_{yi}}{S_{yi}}$

$f_{byi} =$ (psi)

	0
0	0
1	218.1
2	407.4
3	573.2
4	719.7
5	850.1
6	966.9
7	1072
8	1167.3
9	1253.9
10	1333
11	1405.6
12	1472.4
13	1534.1
14	1591.3
15	1644.4
16	1693.8
17	1740
18	1783.2
19	1823.7
20	1861.8

Maximum Bending Stress y-direction = $f_{b.long.max} := 1861.8 \cdot psi$

Percent Stressed = $\frac{f_{b.long.max}}{F_{b.long}} = 90.3 \cdot \%$

$Bending\_Check\_long := if(f_{b.long.max} < F_{b.long}, "OK", "NG")$

Bending_Check_long = "OK"

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Subject:	Foundation Analysis
Location:	Avon Landfill Avon, CT
Rev. 0: 12/4/09	Prepared by: T.J.L Checked by: C.F.C. Job No. 09127

Foundation Analysis:

(Based on Pocket Wireless with 1-5/8" Φ Coax Cables)

Depth of Foundation Embedment = $d_{act} := 17.5$ ft

Diameter of Foundation = $b := 5$ ft

Allowable Lateral Soil Bearing Capacity = $S_1 := 2333$ psf (At 1/3 total depth. Eq. to 200 psf/sf for sandy gravel)

Moment at Ground Line = $M := 694000$ ft·lbs

Height Above Ground Level to Equivalent Lateral Force = $h := 50$ ft

Equivalent Lateral Force = $P := \frac{M}{h} = 13880$ lbs

$$A := \frac{2.34 \cdot P}{S_1 \cdot b} = 2.784$$ (IBC 2003 Sec 1805.7.2)

Required Embendment Depth = $d_{req} := 0.5 \cdot A \cdot \left[1 + \sqrt{\left(1 + \frac{4.36 \cdot h}{A}\right)}\right] = 13.8$ ft (Eq. 18-1 IBC 2003)

$Embedment := if(d_{act} > d_{req}, "OK", "NG")$

Embedment = "OK"

EMS Wireless

RR90-17-XXDP

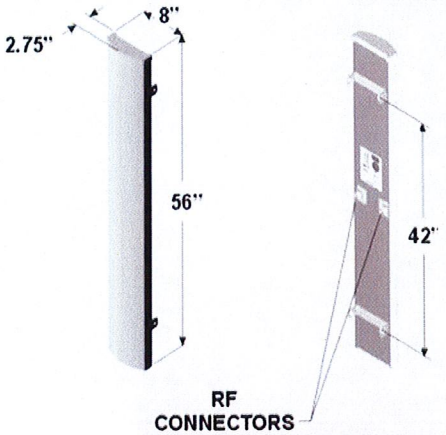
DualPol® Polarization

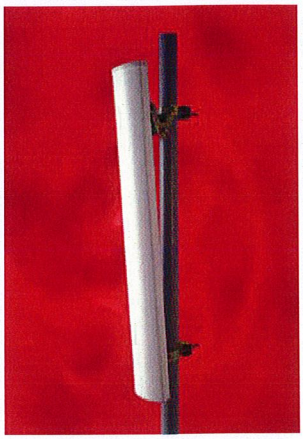
1850 MHz - 1990 MHz

OptiRange™

Electrical Specifications

Azimuth Beamwidth	90°
Elevation Beamwidth	6.8°
Gain	16.5 dBi (14.4 dBd)
Polarization	Dual Linear Slant (± 45°)
Port-to-Port Isolation	≥ 30 dB
Front-to-Back Ratio	> 34 dB
Electrical Downtilt Options	0°, 2°, 4°, 6°
VSWR	1.35:1 Max
Connectors	2; 7-16 DIN (female)
Power Handling	250 Watts CW
Passive Intermodulation	≤ -150 dBc [2 x 20 W (+ 43 dBm)]
Lightning Protection	Chassis Ground





Mechanical Specifications

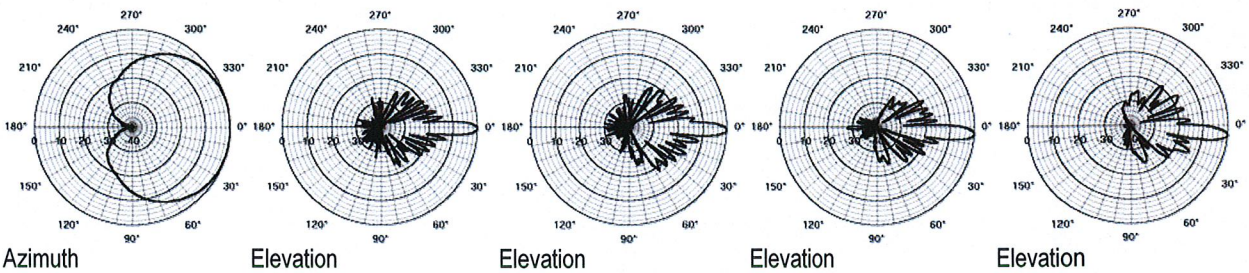
Dimensions (L x W x D)	56 in x 8 in x 2.75 in (142 cm x 20.3 cm x 7.0 cm)
Rated Wind Velocity	150 mph (241 km/hr)
Equivalent Flat Plate Area	3.1ft² (.29 m²)
Front Wind Load @ 100 mph (161 kph)	92 lbs (409 N)
Side Wind Load @ 100 mph (161 kph)	31lbs (139 N)
Weight (Without Mounting Kit)	13.5 lbs (6.2 kg)

Mounting Options

MTG-P00-10, MTG-S02-10, MTG-DXX-20*, MTG-CXX-10*, MTG-C02-10, MTG-TXX-10*

*Note: *Model number shown represents a series of products. See Mounting Options section for specific model number.*

Patterns



Azimuth | Elevation 0° Downtilt | Elevation 2° Downtilt | Elevation 4° Downtilt | Elevation 6° Downtilt

Revised 04/21/04

+1 770.582.0555 ext. 5310 • Fax +1 770.729.0036
www.emswireless.com

Product Data Sheet **APX18-206517-CT2**

Optimizer® Dual Polarized Antenna, 1710-2170, 65deg, 18.5/19.0dBi, 1.8m, FET, 2deg

Product Description

Dense urban networks where site aspect is essential.

Features/Benefits

- **Very broadband design operating from GSM1800 up to 3G-UMTS.**
- **Reduction of visual impact by gathering 3 antennas in a cylindrical volume.**
- **Reduction of site dimensions will ease site acceptance.**
- **Possible camouflage solution on demand.**
- **Wind load thrust highly reduced.**
- **Compatible with usual base stations with 35 dB typical isolation between ports.**
- **Effective polarization diversity ensured by high cross polar discrimination.**
- **Optimized suppression of side lobes allows strong mechanical tilt.**

Technical Specifications

Electrical Specifications

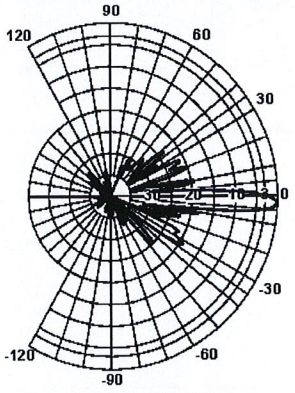
Frequency Range, MHz	1710-1900	1900-2170
Horizontal Beamwidth, deg	68	64
Vertical Beamwidth, deg	5	4.5
Electrical Downtilt, deg	2	
Gain, dBi (dBd)	18.5 (16.4)	19 (16.9)
1st Upper Sidelobe Suppression, dB	>20	>18 (typ 20)
Front-To-Back Ratio, dB	>30	>25
Polarization	Dual pol +/-45°	
VSWR	< 1.4:1	
Isolation between Ports, dB	>30 (typ 35)	
3rd Order IMP @ 2 x 43 dBm, dBc	>150, N/A	
7th Order IMP @ 2 x 46 dBm, dBc	N/A, >170	
Impedance, Ohms	50	
Maximum Power Input, W	300	
Lightning Protection	Direct Ground	
Connector Type	(2) 7-16 DIN Female	

Mechanical Specifications

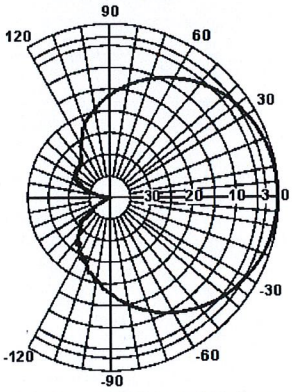
Dimensions - HxWxD, mm (in)	1840 x 169 x 80 (72.44 x 6.65 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	11 (24.2)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m² (ft²)	0.31 (3.32)
Front Thrust @ Rated Wind, N (lbf)	553 (124)
Maximum Thrust @ Rated Wind, N (lbf)	553 (124)
Wind Load - Side @ Rated Wind, N (lbf)	322 (72)
Wind Load - Rear @ Rated Wind, N (lbf)	267 (60)
Radome Material	Fiberglass
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Shipping Weight, kg (lb)	16.5 (36.3)
Packing Dimensions, HxWxD, mm (in)	1964 x 251 x 203 (77.32 x 9.88 x 7.99)

Ordering Information

Mounting Hardware	APM40-2
Mounting Hardware Weight, kg (lb)	3.4 (7.5)



Low Band Vertical Pattern



Low Band Horizontal Pattern

Tower Mounted Amplifier

Dual Band 1900 MHz with 850 MHz Bypass

1900/850 MHz

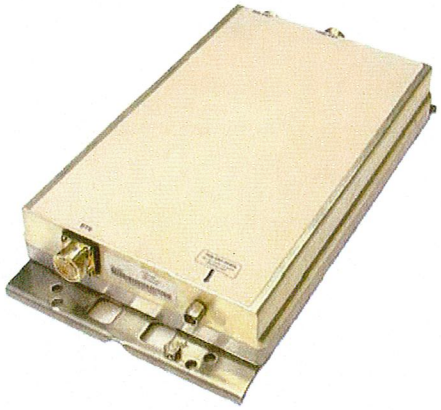
Part Number:
LGP 214nn

Up-link: 1850-1910 MHz
Down-link: 1930-1990 MHz
Bypass: 824-894 MHz

Gain: 12 dB
Noise Figure: < 1.7 dB

The Powerwave® TMA-DD 1900/850 is a dual band Tower Mounted Amplifier (TMA) to be installed near the antenna. Deployed in an AMPS, GSM, GPRS, EDGE and CDMA network it will increase capacity and coverage as well as extend the battery life time for the handsets. The TMA System will provide enhanced coverage and improved up-link signal quality. Appropriate for new rollouts by optimizing coverage with a reduced number of BTSs or as an upgrade to existing BTSs for enhancing the existing coverage.

Extended band TMA facilitates simplified logistics, especially when the frequency bands are scattered. The unit comprises of high Q band-pass filters, dual balanced low noise amplifiers with circuits for active bias, supervision, alarms and lightning protection circuit. The Powerwave patented design with all active components integrated within the filter body provides an extremely reliable, compact and lightweight TMA solution. The vented enclosure design is employed to prevent the effect of condensation, thereby guaranteeing long, reliable, maintenance-free service in all environmental conditions. These TMAs offer an easy to install, maintenance free, cost effective solution for coverage enhancement and increased quality in mobile communication networks.



Key Benefits:

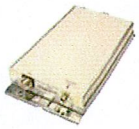
- 850 MHz Bypass
- Improved Network Quality
- Increased Coverage
- State of the Art Performance
- Excellent Power Handling
- Low Tx Loss
- Exceptional Reliability

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

Tower Mounted Amplifier



1900/850 MHz

Technical Specifications

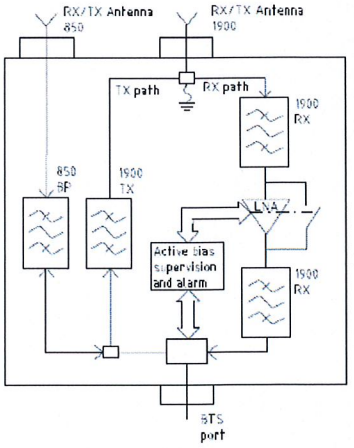
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency range, full band (60 MHz)	1930-1990
	Insertion loss* (dB)	< 0.6
	Return loss* (dB)	> 20
Intermodulation	2 Tx@x43 dBm (dBc)	<-158
Alarm Functionality	Two levels,individually supervised LNAs	
Power Consumption	@12 VDC	1.2 W

* Typical

All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

Mechanical Specifications

Size,W x H x D (without mounting plate)	235 x 366 x 66 mm (9.2 x 14.4 x 2.6 in)
Weight	6.4 kg (14.1 lbs)
Color	Off white (NCS 1502-R)
Housing	Aluminum
RF-connectors	DIN 7/16 female.
Mounting kit	Mounting kit for pole and wall is included
Temperature range	-40 °C to +65 °C (-40 °F to +149 °F)
MTBF	>1 million hours
Safety	UL 60 950
Ingress protection, IP 65	EN 60 529
Environmental	ETS 300 019
EMC	FCC Part 15



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Powerwave technologies

COVERAGE AND CAPACITY | TECHNOLOGY LEADERSHIP | GLOBAL PARTNER | INTEGRATED SOLUTIONS | QUALITY AND RELIABILITY

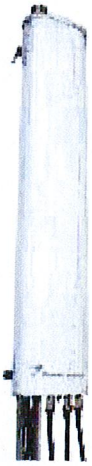
Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

Part Number: 7770.00 | Horizontal Beamwidth: 90° Gain: 13.5/16 dBi | Electrical Downtilt: Adjustable Connector Type: 7/16 female

The Powerwave dual band dual polarized broadband antenna has individual adjustable electrical downtilt per band (upgradeable to Remote Electrical Tilt (RET). Four connector ports allow separate tilts on each frequency band and ensure the use of diversity concepts. The phase shifter technology, based on a patented sliding dielectric, minimizes intermodulation distortion and maximizes efficiency. The slant +/- 45° dual polarization system provides the independent fading signals needed for achieving top-quality coverage via diversity concepts. The Powerwave Broadband antenna design is based on a patented stacked aperture-coupled patch technology, which provides high isolation performance and a wide VSWR bandwidth. The antennas have superior radiation patterns due to a unique reflector design which provides a very small variation of the –3dB horizontal beam width over the frequency band as well as a high front-to-back ratio.



Key Benefits

- Excellent broad- and multi-band capabilities
- Polarization purity makes good diversity gain
- Excellent pattern performance and high gain over frequency
- High passive intermodulation performance
- Light, slim and robust design

Preliminary

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

806-960/1710-2170 MHz

Dual Broadband Antenna

Electrical Specifications (Preliminary)

Frequency band (MHz)	806-960		1710-2170
Gain, ± 0.5dB (dBi)	13.5		16.0
Polarization		Dual linear ±45°	
Nominal Impedance (Ohm)		50	
VSWR	1.5:1		
VSWR			1.5:1
Isolation between inputs (dB)	30		
Isolation between inputs (dB)			30
Inter band isolation (dB)		40	
Horizontal -3 dB beamwidth	85 ± 5°		85 ± 5°
Tracking, Horizontal plane, ±60° (dB)	<2.0		
Tracking, Horizontal plane, ±60° (dB)			<2.0
Electrical downtilt range (adjustable)	0° to 10°		0° to 8°
Vertical -3 dB beamwidth	14.3 ± 2.0°		6.6 ± 1°
Sidelobe suppression, Vertical 1 st upper (dB)	>17,16,15 x=0, 5, 10° MET		> 17, 16,15 x=0, 4, 8° MET
Vertical beam squint	<0.8°		<0.5°
First null-fill (dB)	<-25		<-25
Front-to-back ratio (dB)	>25		>27
Front-to-back ratio, total power (dB)	>20		>23
IM3, 2Tx@43dBm (dBc)	<-153		
IM3, 2Tx@43dBm (dBc)			<-153
IM7, 2Tx@43dBm (dBc)			<-160
Power Handling, Average per input (W)	400		250
Power Handling, Average total (W)	800		500

All specifications are subject to change without notice.
Contact your Powerwave representative for complete performance data.

Mechanical Specifications

Connector Type	4 x 7/16 DIN female
Connector Position	Bottom
Dimensions, HxWxD	1408mm x 280mm x 125mm (55"x11"x5")
Weight Including Brackets	15.8 kg (35 lbs)
Wind Load, Frontal, 42m/s Cd=1	435N (98 lbf)
Survival Wind Speed (m/s)	70 (156mph)
Lightning Protection	DC grounded
Radome Material	GRP
Radome Color	Light Gray
Mounting	Pre-mounted Standard Brackets
Packing Size	1550mm x 355mm x 255mm (61"x14"x10")

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Powerwave technologies

COVERAGE AND CAPACITY | TECHNOLOGY LEADERSHIP | GLOBAL PARTNER | INTEGRATED SOLUTIONS | QUALITY AND RELIABILITY

D031-08208 Rev A

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
www.ct.gov/csc

December 11, 2008

Carrie L. Larson, Esq.
Pullman & Comley, LLC
90 State House Square
Hartford, CT 06103-3702

RE: **EM-POCKET-004-081112** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut.

Dear Attorney Larson:

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 following conditions:

- A post-construction tower rating of not more than 100 percent is achieved; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that a post-construction tower rating of not more than 100 percent has been achieved.

The proposed modifications are to be implemented as specified here and in your notice dated November 11, 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,

S. Derek Phelps
Executive Director

SDP/CDM/laf

c: The Honorable John F. Carlson, Chairman Town Council, Town of Avon
Philip K. Schenck, Jr., Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
TowerCo

PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

EM-POCKET-004-081112

CARRIE L. LARSON
90 State House Square
Hartford, CT 06103-3702
p (860) 424-4312
f (860) 424-4370

www.pullcom.com

ORIGINAL

November 11, 2008

Via Federal Express

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

Re: Notice of Exempt Modification
TowerCo formerly known as Sprint Sites USA Telecommunications Facility
277 Huckleberry Hill Road, Avon, Connecticut

Dear Mr. Phelps:

Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), intends to install antennas and appurtenant equipment at the existing 100-foot ELAM Laminated Wood Monopole facility owned by TowerCo, formerly owned by Sprint Sites USA and located at 277 Huckleberry Hill Road, Avon, Connecticut ("Facility"). Pocket Communications provides prepaid, flat rate wireless voice and data services to more than a quarter of a million subscribers. Pocket is licensed by the Federal Communications Commission (FCC) to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation. This installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g et. seq. (PUESA), and Section 16-50j-72(b)(2) of the Regulations of the Connecticut State Agencies adopted pursuant to PUESA. In accordance with R.C.S.A. Section 16-50j-73, a copy of this notice has been sent to Philip K. Schenck, Jr., Town Manager, Town of Avon.

The existing Facility consists of a 100-foot ELAM Laminated Wood monopole tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-47'-17" and Long: 72°–55'-5.3".** The tower is located in the eastern portion of Avon, roughly 1,700 feet east of the Farmington River, its border with Burlington. The Facility is approximately 2,000 feet east of Canton Road (Route 179) and roughly 1,800 feet west of Huckleberry Hill Road (see Site Map, attached as Exhibit A). The tower currently supports AT&T antennas at the ninety foot level (90') centerline AGL (above ground level); and Sprint antennas at the one hundred foot level (100') AGL. Pocket proposes to install three APXV18-206517-C flush mount antennas on the tower at the eighty foot level (80') AGL, and a Nortel CDMA Micro BTS 3231 cabinet, mounted on an "H-Frame," contained within a six foot by six foot (6'-0" x 6'-0") lease area. A small GPS antenna will be mounted to the tower at the

approximate forty five foot (45') level AGL. An ice bridge which will run from the lease area to the tower. Utilities will be run via a proposed underground conduit from an existing utility backboard, within the compound (See Design Drawings and Equipment Specifications, attached as Exhibits B and C respectively).

For the following reasons, the proposed modifications to the Huckleberry Hill Road Facility meet the exempt modification criteria set forth in R.C.S.A. Section 16-50j-72(b)(2):

1. The proposed modification will not increase the height of the tower as Pocket's antennas will be installed at a center line height of approximately 80 feet.

2. The installation of Pocket's equipment and shelter will not require an extension of the site boundaries.

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

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. The worst-case RF power density calculations for the proposed Pocket antennas would be 47.83% of the FCC standard (see general power density calculations table, attached as Exhibit D).

Also attached, Exhibit E, is a structural analysis confirming that the tower can support the existing and proposed antennas and associated equipment.

For the foregoing reasons, Pocket respectfully submits that the proposed antenna installation and equipment at the Avon Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Respectfully Submitted,

Carrie L. Larson

cc: Philip K. Schenck, Jr., Town Manager, Town of Avon is also underlying property owner

Exhibit A

Site Map

Pocket Site HFCT1481A

277 Huckleberry Hill Road

Avon, Connecticut

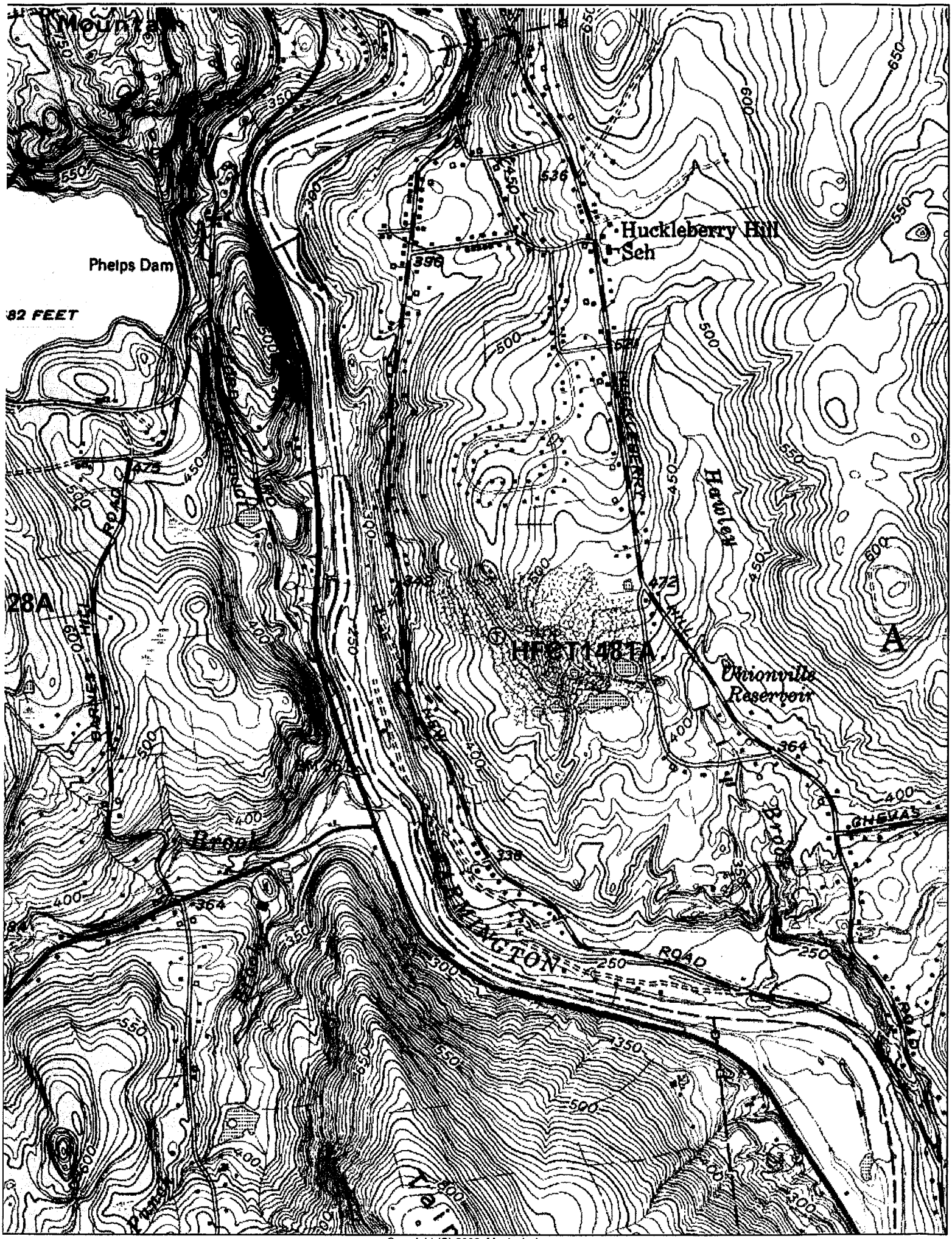


Exhibit B

Design Drawings

Pocket Site HFCT1481A

277 Huckleberry Hill Road

Avon, Connecticut

PROJECT INFORMATION

TOWER OWNER:	SPRINT SITES USA 1825 LOCKEWAY DRIVE SUITE 201 ALPHARETTA, GA 30004
OWNER SITE ID#:	SSUSA CT33XC589
APPLICANT:	YOUGHIOGHENY COMMUNICATIONS–NORTHEAST LLC 2819 NW LOOP 410 SAN ANTONIO, TX 78230
SITE ADDRESS:	277 HUCKLEBERRY HILL ROAD AVON, CT 06001
COUNTY:	HARTFORD
LATITUDE:	41.788161
LONGITUDE:	–72.918211
STRUCTURE HEIGHT:	100' AGL
ZONING CLASSIFICATION:	N/A
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
POWER COMPANY	CL&P 1–860–947–2121
TELEPHONE COMPANY:	AT&T 1–888–727–8368
DESIGN FIRM:	URS CORPORATION AES 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067 PHONE: 860–529–8882

DRAWING INDEX

STRUCTURAL REVIEW

A TOWER ANALYSIS HAS NOT BEEN PERFORMED FOR THE PREPARATION OF THESE PLANS. AS OF THE ISSUANCE OF THESE DRAWINGS, THE EXISTING TOWER HAS NOT BEEN EVALUATED FOR REPLACEMENT/ADDITION OF ANTENNAS, COAX CABLES AND EQUIPMENT. NO WORK SHALL OCCUR ON THIS TOWER PRIOR TO THE ISSUANCE OF A PASSING STRUCTURAL TOWER ANALYSIS. A COPY OF THE TOWER ANALYSIS SHALL BE FORWARDED TO URS CORPORATION. ALL REINFORCEMENT (IF REQUIRED) SHALL BE PERFORMED PRIOR TO ANY WORK UNDER THIS CONTRACT BEING PERFORMED.

APPROVALS

_____ REAL ESTATE

_____ RF

_____ OPS/CONSTRUCTION

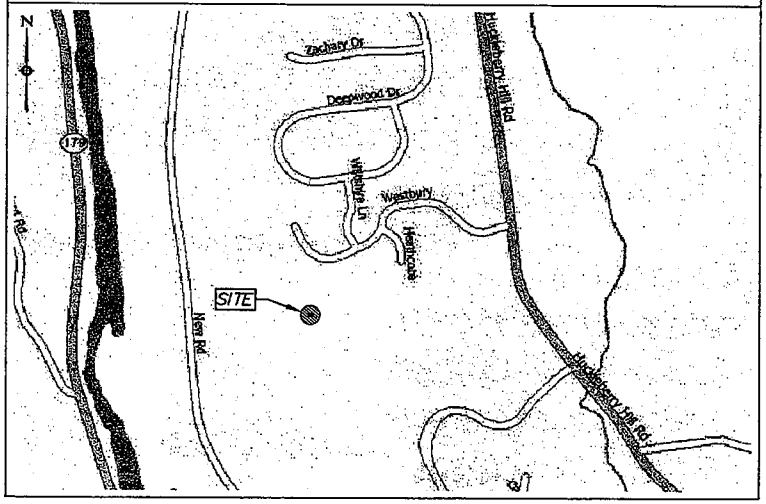
_____ LEGAL/COMPLIANCE

_____ NET DESIGN

pocket™
SMART WIRELESS

HFCT1481A
277 HUCKLEBERRY HILL ROAD
100' LAM. WOOD POLE

LOCATION MAP



DRIVING DIRECTIONS

FROM HARTFORD:

TAKE I–84 EAST TOWARDS WATERBURY. MERGE ONTO CT–4 W/FARMINGTON AVE VIA EXIT 39 TOWARD FARMINGTON. TURN SLIGHT RIGHT ONTO MAIN ST/CT–4. TURN SLIGHT RIGHT ONTO HUCKLEBERRY HILL RD. AFTER APPROXIMATELY 2.1 MILES, TURN LEFT INTO AVON LANDFILL ENTRANCE. THE SITE ACCESS ROAD IS APPROXIMATELY 0.15 MILE BEYOND THE GATE.

APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:

CONNECTICUT STATE BUILDING CODE
- 2003 INTERNATIONAL BUILDING CODE
- 2003 INTERNATIONAL PLUMBING CODE
- 2003 INTERNATIONAL MECHANICAL CODE
- 2003 INTERNATIONAL EXISTING BUILDING CODE
- 2005 CONNECTICUT SUPPLEMENT

ELECTRICAL CODE:
- 2005 NATIONAL ELECTRICAL CODE

CONNECTICUT STATE FIRE SAFETY CODE
- 2003 INTERNATIONAL FIRE CODE

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST APPROVED EDITION OF THE FOLLOWING STANDARDS.

AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–F, STRUCTURAL STANDARD FOR STRUCTURAL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:

TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM

IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR–1275 GENERAL INSTALLATION REQUIREMENTS

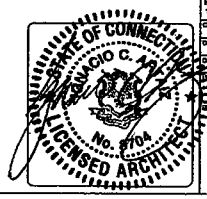
TELCORDIA GR–1503 COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

SITE NOTES

1. THIS SITE IS UNMANNED AND IS RESTRICTED TO OUTDOOR EQUIPMENT. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
2. POCKET COMMUNICATIONS CERTIFIES THAT THIS TELEPHONE EQUIPMENT FACILITY WILL BE SERVICED ONLY BY POCKET COMMUNICATIONS EMPLOYEES AND THE WORK ASSOCIATED WITH ANY EQUIPMENT CANNOT BE PERFORMED BY HANDICAPPED PERSONS. THIS FACILITY WILL BE FREQUENTED ONLY BY SERVICE PERSONNEL FOR REPAIR PURPOSES ONLY. THIS FACILITY IS EXEMPT FROM THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA) APPENDIX B, SECTION 4.11.(5)(B)
3. NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
4. NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
5. NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.
6. POCKET COMMUNICATIONS MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.



NO.	DATE	REVISIONS	BY
0	10/23/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

PROJECT NAME: HFCT1481A, 277 HUCKLEBERRY HILL ROAD

SHEET: TITLE SHEET

URS
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

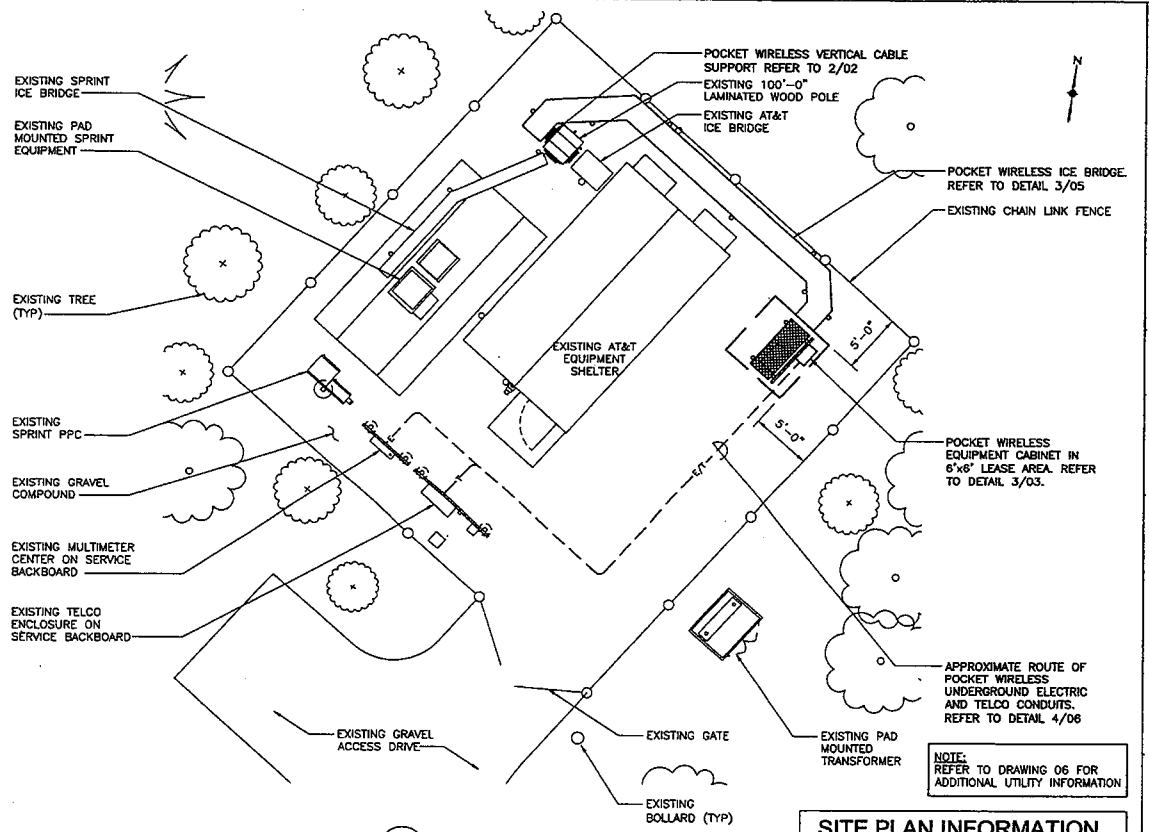
CHECKED BY:	JCF
DRAWN BY:	JES
DATE:	10/15/08
URS JOB NUMBER:	CPC1050/36923970
DRAWING NUMBER	01

CONSTRUCTION NOTES

1. FIELD VERIFICATION: CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, POCKET COMMUNICATIONS ANTENNA MOUNT LOCATION AND ANTENNAS TO BE INSTALLED.
2. COORDINATION OF WORK: CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH POCKET COMMUNICATIONS.
3. GRAVEL SURFACE IN AREAS OF COMPOUND THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL CONDITION BY CONTRACTOR.

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – POCKET COMMUNICATIONS
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND THE ENGINEER.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, AND GROUNDING CABLES AS SHOWN ON THE SITE PLAN
8. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
9. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
10. CONTRACTOR TO OBTAIN REQUIRED NOTICE TO PROCEED DOCUMENTS FROM THE TOWER OWNER BEFORE COMMENCING CONSTRUCTION.

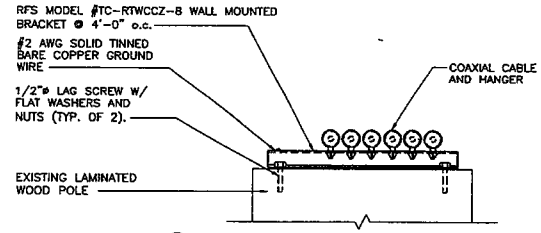


1/02 COMPOUND PLAN
SCALE: N.T.S.

NOTE:
REFER TO DRAWING 06 FOR ADDITIONAL UTILITY INFORMATION

SITE PLAN INFORMATION

THIS SITE PLAN DRAWING WAS COMPILED FROM DATA PROVIDED BY GRAPEVINE SOLUTIONS AND AVAILABLE EXISTING DRAWINGS OF THE SUBJECT AREA.



2/02 VERTICAL CABLE SUPPORT DETAIL
SCALE: N.T.S.

STATE OF CONNECTICUT
MARIO C. [illegible]
No. 8758
LICENSED ARCHITECT

NO.	DATE	REVISIONS	BY
0	10/23/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

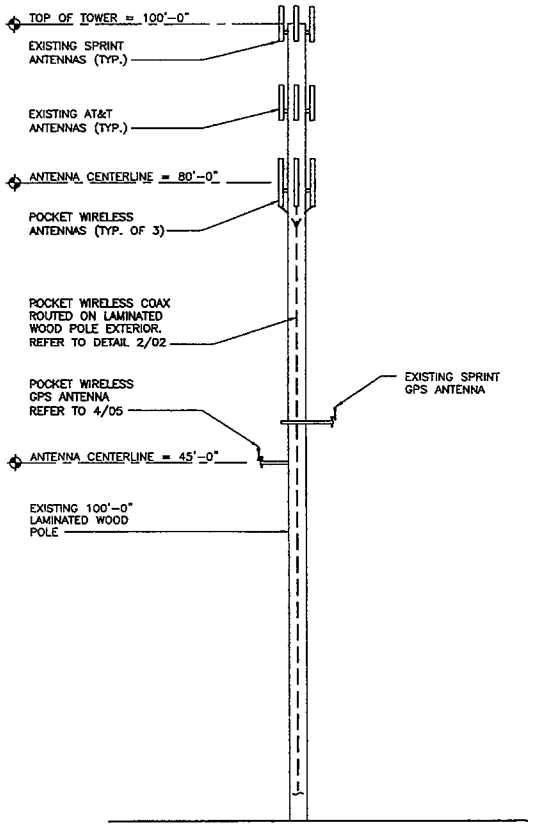
PROJECT NAME: HFCT1461A, 277 HUCKLEBERRY HILL ROAD
SHEET: SITE PLAN AND NOTES

URS

URS CORPORATION AES
600 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: JES
DATE: 10/15/08
URS JOB NUMBER: PC1050/36923970
DRAWING NUMBER: 02

A TOWER ANALYSIS HAS NOT BEEN PERFORMED FOR THE PREPARATION OF THESE PLANS. AS OF THE ISSUANCE OF THESE DRAWINGS, THE EXISTING TOWER HAS NOT BEEN EVALUATED FOR REPLACEMENT/ADDITION OF ANTENNAS, COAX CABLES AND EQUIPMENT. NO WORK SHALL OCCUR ON THIS TOWER PRIOR TO THE ISSUANCE OF A PASSING STRUCTURAL TOWER ANALYSIS. A COPY OF THE TOWER ANALYSIS SHALL BE FORWARDED TO URS CORPORATION. ALL REINFORCEMENT (IF REQUIRED) SHALL BE PERFORMED PRIOR TO ANY WORK UNDER THIS CONTRACT BEING PERFORMED.



1 / 03 TOWER ELEVATION
SCALE: N.T.S.

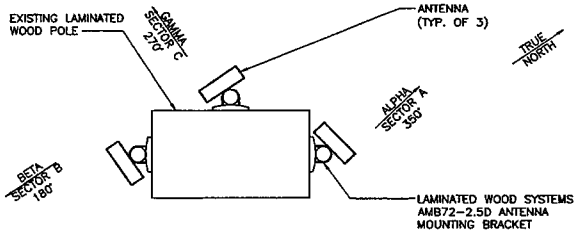
ANTENNA KEY

	# ANTENNAS PER SECTOR	ANTENNA NUMBER	COAX COLOR CODE	ANTENNA VENDOR	MODEL NUMBER	AZIMUTH	C/L HEIGHT	MECHANICAL DOWNTILT*	ELECTRICAL DOWNTILT*	COAX SIZE	CABLES PER ANTENNA	COAX MANUFACTURER
ALPHA	1	A-1	(1) RED BAND	RFS	APXV18-206517S-C	350°	80'-0"	0°	0°	1 5/8"ø	2 ● 130'	RFS
BETA	1	B-1	(1) BLUE BAND	RFS	APXV18-206517S-C	180°	80'-0"	0°	0°	1 5/8"ø	2 ● 130'	RFS
GAMMA	1	C-1	(1) GREEN BAND	RFS	APXV18-206517S-C	270°	80'-0"	0°	0°	1 5/8"ø	2 ● 130'	RFS
GPS	1	–	–	NORTEL	NTGB01MA	–	45'-0"	–	–	1/2"	1 ● 95'	RFS

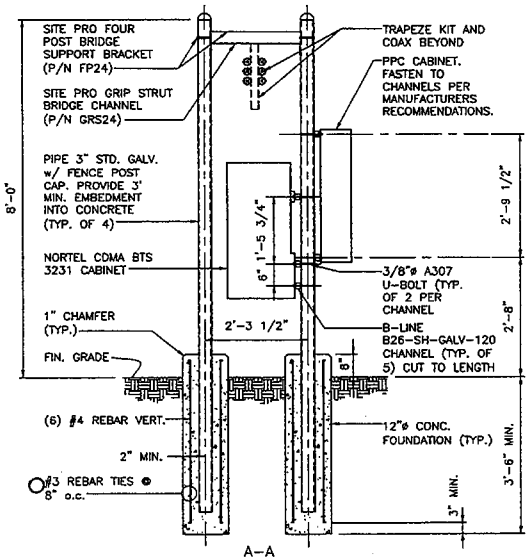
*REFER TO RFDS ANTENNA SHEET FOR FINAL TILT AND AZIMUTHS

TOWER NOTES:
1. FOR DETAILED TOWER INFORMATION, REFER TO TOWER ERECTION DRAWINGS BY OTHERS. THE TOWER SHOWN ON THIS SHEET IS SHOWN FOR GENERAL CONFIGURATION PURPOSES ONLY.
2. ANTENNA CONFIGURATION IS SUBJECT TO CHANGE. VERIFY ANTENNA HEIGHT, DOWN-TILT, AND AZIMUTH WITH PROJECT MANAGER PRIOR TO CONSTRUCTION.

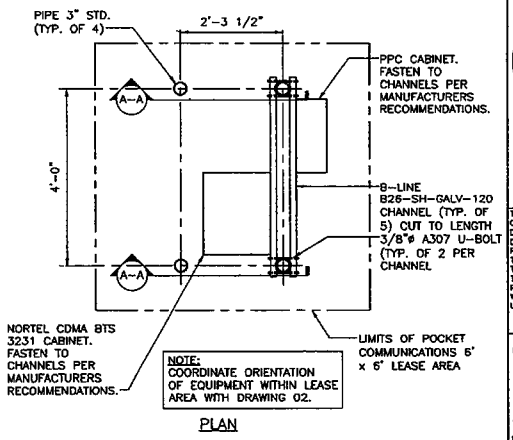
ANTENNA NOTES:
1. ALL COAX SHALL BE COLOR CODED AT THE ANTENNA AND AT THE EQUIPMENT CABINET.
2. (2) COLOR BANDS DENOTES TRANSMIT. TRANSMITS TO BE CONNECTED TO THE +45 PORTS OF THE ANTENNAS.
3. PRIOR TO ORDERING ANY ANTENNAS OR COAX, CONTRACTOR SHALL CONTACT POCKETS CONSTRUCTION MANAGER AND OBTAIN APPROVAL FOR MATERIALS LISTED. CONTRACTOR IS SOLELY RESPONSIBLE FOR THIS COORDINATION.



2 / 03 ANTENNA SECTOR PLAN
SCALE: N.T.S.

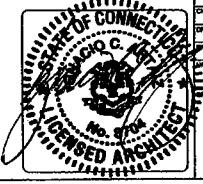


A-A ELEVATION



PLAN

3 / 03 CABINET SUPPORT FRAME
SCALE: N.T.S.



NO.	DATE	ISSUED FOR CONSTRUCTION	BY
0	10/23/08	REVISIONS	

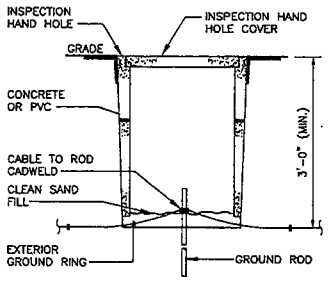
pocket
SMART WIRELESS

PROJECT NAME: HFCT1481A, 277 HUCKLEBERRY HILL ROAD
SHEET: TOWER ELEVATION, ANTENNA PLAN AND DETAILS

URS

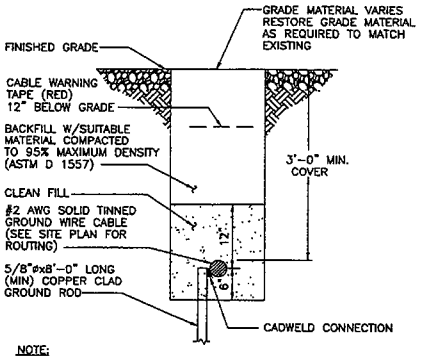
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860) 529-5932

CHECKED BY: JCF
DRAWN BY: JES
DATE: 10/15/08
URS JOB NUMBER: PC1050/36923970
DRAWING NUMBER: 03



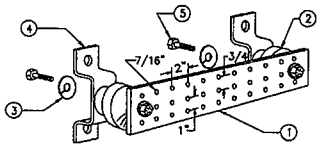
NOTE:
INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 8" IN WIDTH/DIAMETER

7/04 GROUND ROD WITH INSPECTION HANDHOLE
SCALE: N.T.S.



NOTE:
1. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
2. CADWELD GROUND ROD TO GROUND RING AFTER GROUND ROD HAS BEEN DRIVEN INTO PLACE

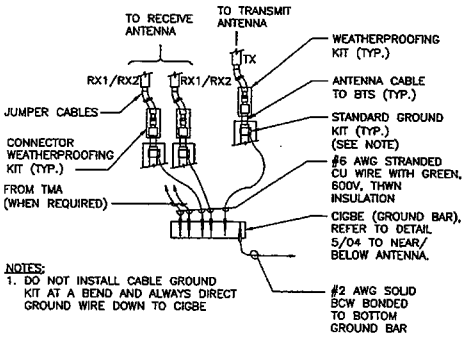
6/04 EGR DETAIL
SCALE: N.T.S.



LEGEND

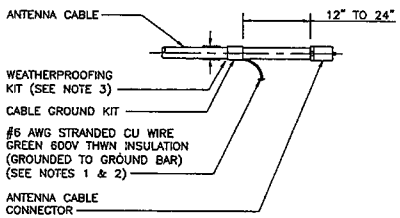
1- COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3- 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUAL
4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR EQUAL

5/04 MASTER/EQUIPMENT GROUND BAR DETAIL
SCALE: N.T.S.



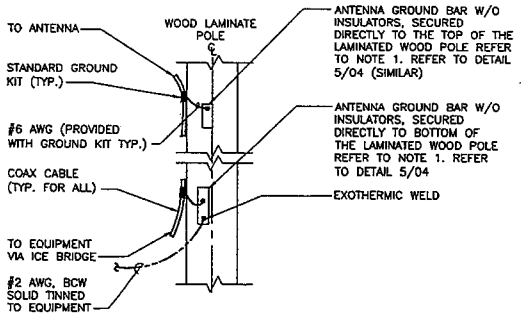
NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

4/04 CONNECTION OF GROUND WIRE TO GROUND BAR
SCALE: N.T.S.



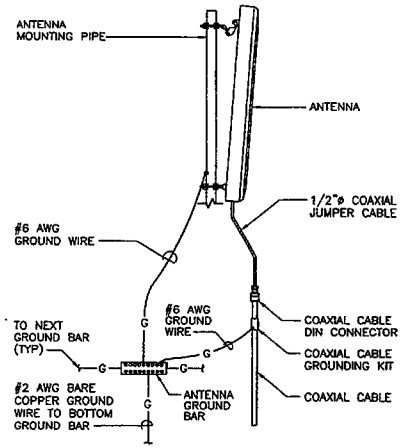
NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

3/04 CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE
SCALE: N.T.S.

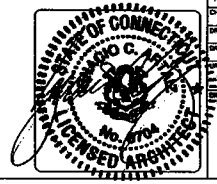


NOTE:
1.NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF LAMINATE WOOD POLE, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

2/04 ANTENNA CABLE GROUNDING- LAMINATED WOOD POLE
SCALE: N.T.S.



1/04 TYPICAL ANTENNA GROUNDING DETAIL
SCALE: N.T.S.



NO.	DATE	REVISIONS	BY
0	10/23/08	ISSUED FOR CONSTRUCTION	JCF

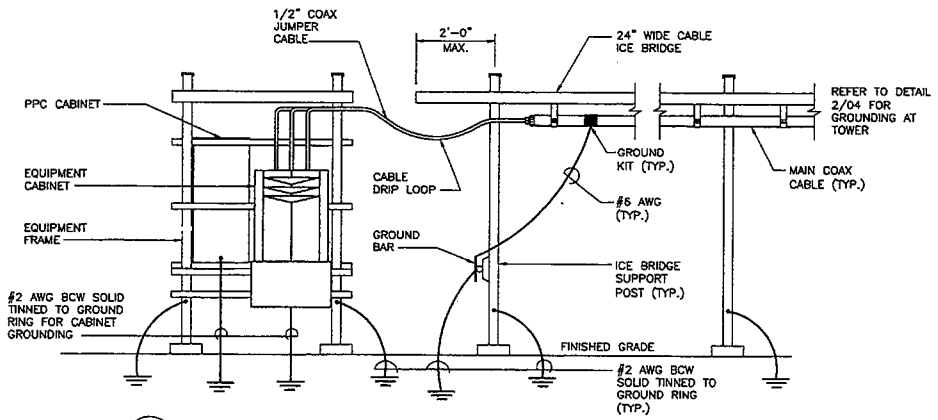
pocket SMART WIRELESS

PROJECT NAME: HFCT1481A, 277 HUCKLEBERRY HILL ROAD

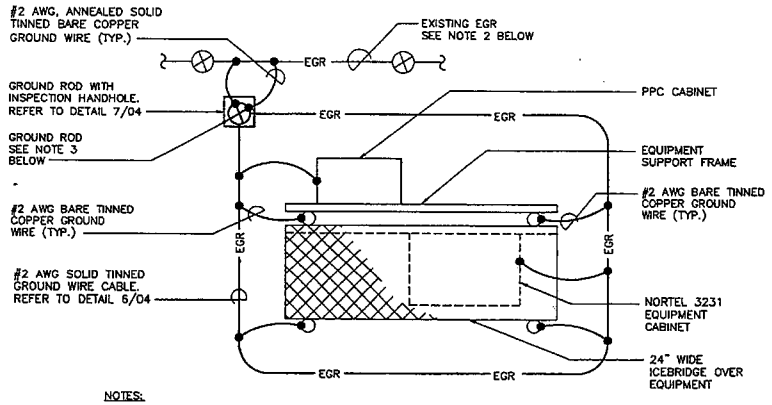
SHEET: GROUNDING DETAILS

URS
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: JES
DATE: 10/15/08
URS JOB NUMBER: SPC1050/36923970
DRAWING NUMBER: 04



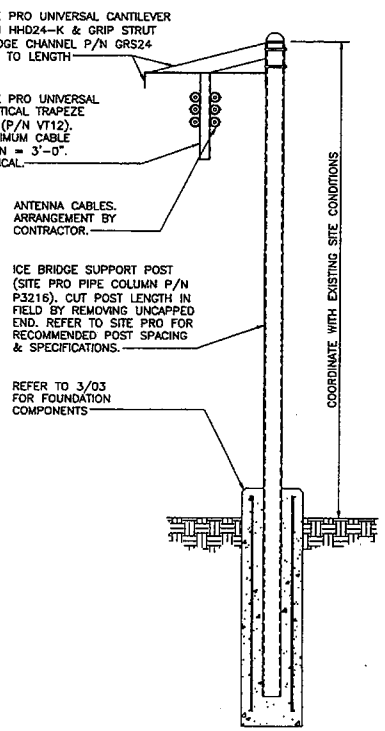
1/05 GROUNDING AT EQUIPMENT CABINET
SCALE: N.T.S.



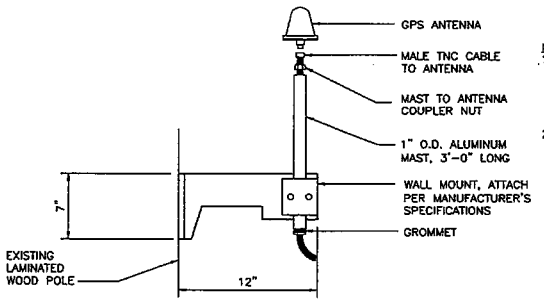
NOTES:

1. SEE SHEET 02 FOR EQUIPMENT ORIENTATION AND LOCATION.
2. EXISTING EGR, VERIFY LOCATION IN FIELD. CONTRACTOR SHALL HAND DIG AND LOCATE EXISTING EGR. IF ANY DAMAGE IS CAUSED TO EXISTING EGR, THE CONTRACTOR SHALL REPAIR THE DAMAGE AT HIS OWN COST TO THE SATISFACTION OF RESPECTIVE CELL ENGINEERS.
3. GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 8'-0"L. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACING OF GROUNDING ELECTRODES SHALL NOT BE LESS THAN 8' O.C. ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'-6" BELOW FINISH GRADE. IF IT IS IMPRACTICAL TO DRIVE THE 8'-0" GROUND ROD, CONTRACTOR SHALL INSTALL THE GROUND ROD HORIZONTALLY IN A TRENCH AWAY FROM STRUCTURE, NOT LESS THEN 36" BELOW FINISHED GRADE. UNDER NO CIRCUMSTANCES SHALL THE GROUND ROD BE CUT OR MODIFIED TO ACCOMMODATE VERTICAL INSTALLATION INTO LEDGE. REFER TO THE NEC 2005, ARTICLE #250 FOR MORE INFORMATION ON GROUNDING.

2/05 EQUIPMENT GROUNDING PLAN
SCALE: N.T.S.



3/05 ICE BRIDGE DETAIL
SCALE: N.T.S.



4/05 GPS MOUNTING DETAIL
SCALE: N.T.S.

NOTES:

1. LOCATION OF ANTENNA MUST HAVE A CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF A SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.
2. ALL GPS ANTENNA LOCATIONS MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF 4 SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.

STATE OF CONNECTICUT — ANGELO C. ... — No. 17704 — LICENSED ARCHITECT

NO.	DATE	REVISIONS	BY
0	10/23/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

PROJECT NAME: HFCT1481A, 277 HUCKLEBERRY HILL ROAD

SHEET: GROUNDING PLAN AND DETAILS

URS

URS CORPORATION AGS
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-0882

CHECKED BY: JCF
DRAWN BY: JES
DATE: 10/15/08
URS JOB NUMBER: PC1050/36923970
DRAWING NUMBER: 05

PANEL SSC

LOAD DESCRIPTION	LOAD (kVA)	BRKR SIZE	CCT NO.	PHASE A	PHASE B	CCT NO.	BRKR SIZE	LOAD (kVA)	LOAD DESCRIPTION
BTS CABINET	2.5	30/2	1			2	30/2	2.2	BTS CABINET
	2.5		3			4		2.2	
LIGHTING	1.9	10/1	5			6	20/1	0.2	GFI OUTLET
SPACE	–	–	7			8	–	–	SPACE
SPACE	–	–	9			10	–	–	SPACE
SPACE	–	–	11			12	–	–	SPACE
SPACE	–	–	13			14	–	–	SPACE
SPACE	–	–	15			16	–	–	SPACE
SPACE	–	–	17			18	–	–	SPACE
SPACE	–	–	19			20	–	–	SPACE
SPACE	–	–	21			22	–	–	SPACE
SPACE	–	–	23			24	–	–	SPACE
LOAD SUB–TOTAL	6.9	LOAD TOTAL		11.5 kVA				4.6	LOAD SUB–TOTAL

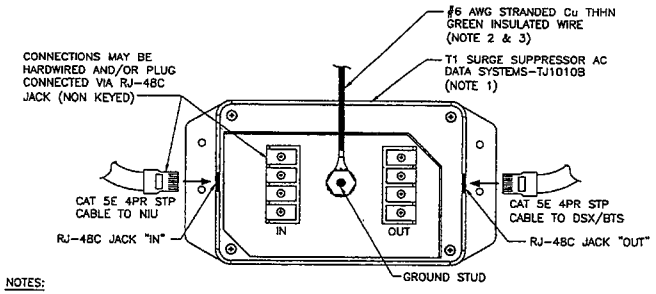
100A MCB, 120/208/240V, 1ø, 3 WIRE, 65,000 AIC

TOTAL CONNECTED LOAD	11.5 KW	
25% OF LARGEST CONT. LOAD	1.25 KW	
TOTAL LOADS	12.75 KW	
NOTE: ALL NON–OPTIONAL BREAKERS PROVIDED BY SSC MFR		

1/06 PANEL SCHEDULE
SCALE: N.T.S.

GENERAL ELECTRIC NOTES:

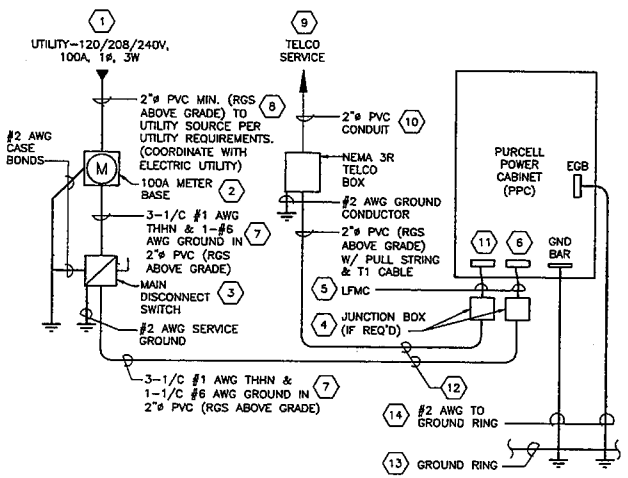
1. ALL ELECTRICAL AND GROUNDING WORK SHALL BE PERFORMED IN ACCORDANCE WITH PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT ROUTINGS ARE SCHEMATIC, CONTRACTOR SHALL VERIFY ROUTING AND LENGTHS PRIOR TO CONSTRUCTION.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
4. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
5. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES, AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.



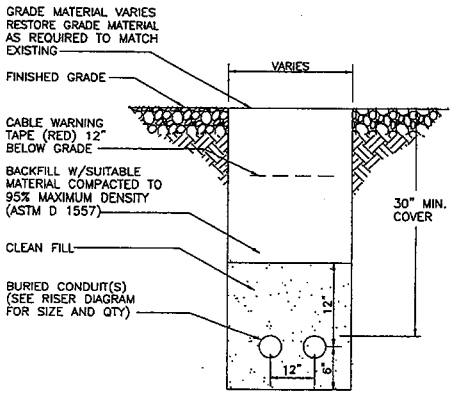
NOTES:

1. MOUNT T1–TVSS UNIT ON EQUIPMENT FRAME HOUSING THE DSX UNIT. USE APPROPRIATE STAINLESS STEEL BOLTS WITH FLAT WASHERS AND A LOCK WASHER ON THE NUT SIDE. THE TVSS MAY BE LOCATED ON THE TELCO BACKBOARD. REFER TO MANUFACTURER'S INSTRUCTIONS.
2. ATTACH RING TERMINAL FROM SUPPLIED GROUND CONDUCTOR TO TVSS GROUND STUD SECURELY FASTEN WITH SUPPLIED WASHER AND NUT. REFER TO MANUFACTURER'S INSTRUCTIONS. FOR PROPER PERFORMANCE, THE GROUND CONDUCTOR LENGTH SHOULD BE LIMITED WITH NO SHARP BENDS ON COILS.
3. WHEN TVSS IS MOUNTED ON EQUIPMENT FRAME, BOND THE GROUND CONDUCTOR TO THE EQUIPMENT FRAME GROUND. ENSURE PROPER GROUNDING SURFACES. WHEN TVSS IS MOUNTED ON THE TELCO BACK BOARD, BOND THE GROUND CONDUCTOR TO THE TELCO (BOARD) GROUND BAR OR NEAREST GROUND BAR.

3/06 TVSS DETAIL
SCALE: N.T.S.



2/06 POWER, TELCO, GROUND SINGLE LINE DIAGRAM FOR OUTDOOR CABINET
SCALE: N.T.S.



ELECTRICAL/TELEPHONE TRENCH DETAIL NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION. THE TRENCH SHALL BE BACKFILLED IMMEDIATELY FOLLOWING PLACEMENT OF THE CONDUITS.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

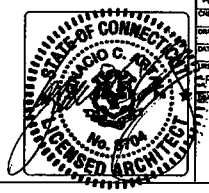
4/06 TYPICAL ELECTRICAL/ TELEPHONE TRENCH DETAIL
SCALE: N.T.S.

REFERENCE NOTES:

1. ELECTRICAL DEMARCATION POINT. ELECTRICAL CONTRACTOR TO COORDINATE WITH LOCAL UTILITY COMPANY FOR SERVICE TO METER.
2. CONTRACTOR TO SUPPLY AND INSTALL A 100A, 120/208/240V 1ø, 3W METER BASE. METER BASE TO BE NEMA 3R RATED AND ACCEPTABLE TO LOCAL UTILITY. PROVIDE WITH MECHANICALLY ATTACHED ENGRAVED IDENTIFICATION LABEL INDICATING "POCKET COMMUNICATIONS METER".
3. CONTRACTOR TO SUPPLY AND INSTALL NEMA 3R 100A FUSIBLE DISCONNECT SWITCH WITH LOCKABLE HANDLE. PROVIDE WITH TWO (2) 100A FUSES. AIC RATING TO COORDINATE WITH LOCAL UTILITY REQUIREMENTS. PROVIDE WITH MECHANICALLY ATTACHED ENGRAVED IDENTIFICATION LABEL INDICATING "POCKET COMMUNICATIONS SERVICE DISCONNECT".
4. WEATHER TIGHT NEMA 3R JUNCTION BOX (IF REQUIRED). SIZE TO NEC CODE FOR APPLICATION.
5. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT W/ WEATHER TIGHT FITTINGS AND SUPPORTS. SIZE AND CONTENTS TO MATCH ASSOCIATED USE (POWER OR TELCO) SEE NOTE #5 BELOW
6. UTILITY POWER ENTRY INTO CABINET. COORDINATE TERMINATION WITH CABINET MANUFACTURER.
7. CONTRACTOR SHALL SUPPLY AND INSTALL 2" GRC. AFG AND PVC 36" BFG C/W 3–#1 & 1–#6G AWG THHN FOR UTILITY SERVICE.
8. CONTRACTOR SHALL SUPPLY AND INSTALL 2" GRC. AFG AND PVC 36" BFG C/W 3–#1 & 1–#6G. AWG THHN FOR UTILITY SERVICE.
9. TELCO DEMARCATION POINT. ELECTRICAL CONTRACTOR TO COORDINATE WITH LOCAL TELCO FOR SERVICE TO TELCO BOX OR CABINET.
10. CONTRACTOR TO SUPPLY AND INSTALL (1) 2" GRC AFG AND PVC 36" BFG C/W PULL CORDS FOR TELCO SERVICE TO CABINET TERMINATION POINT.
11. TELCO SERVICE ENTRY INTO CABINET. COORDINATE TERMINATION WITH CABINET MANUFACTURER.
12. CONTRACTOR TO ARRANGE AND PAY FOR UNDERGROUND UTILITY LOCATION SURVEYS FOR ALL TRENCHING. REUSE NATIVE BACKFILL AND RE–INSTATE TO ORIGINAL CONDITION. INSTALL 6" WIDE METALLIC LINED RED PLASTIC MARK TAPE 12" BELOW GRADE.
13. PORTION OF EXTERIOR GROUND RING
14. (1) #2 SOLID BARE TINNED COPPER EQUIPMENT GROUND CONDUCTOR BONDED TO 5/8"x8' COPPER CLAD STEEL GROUNDING ELECTRODES. LOCATE GROUNDING ELECTRODE ADJACENT TO CABINET. BOND GROUNDING ELECTRODE SYSTEM TO CABINET GROUND RING.

NOTES:

1. CONTRACTOR SHALL PROVIDE 100 AMP, SINGLE PHASE, 120/208/240 VAC, 60 HZ ELECTRIC SERVICE FOR SITE
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY BEFORE THE START OF CONSTRUCTION. POWER AND TELCO CONDUIT SHALL BE PROVIDED AND INSTALLED PER UTILITY REQUIREMENTS.
3. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT REFER TO DRAWINGS PROVIDED BY AC OR TELCO PANEL MANUFACTURER.
4. ALL SERVICE EQUIPMENT AND INSTALLATIONS SHALL COMPLY WITH THE N.E.C. AND UTILITY COMPANY AND LOCAL CODE REQUIREMENTS.
5. CONTRACTOR SHALL INSTALL SUFFICIENT LENGTHS OF LFMC (NOT EXCEEDING 6'–0") INCLUDING ALL CONDUIT FITTINGS (NUTS, REDUCING BUSHINGS, ELBOWS, COUPLINGS, ETC.) NECESSARY FOR CONNECTION FROM IMC CONDUIT TO THE PURCELL POWER CABINET, (PPC).
6. CONTRACTOR SHALL PROVIDE ELECTRICAL SERVICE EQUIPMENT WITH FAULT CURRENT RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT FROM THE POWER UTILITY.
7. CONTRACTOR SHALL VERIFY THAT THE MAIN BONDING JUMPER AND GROUNDING ELECTRODE CONDUCTOR IS INSTALLED PROPERLY IN MAIN DISCONNECT SWITCH.



NO.	DATE	REVISIONS	BY
0	10/23/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

PROJECT NAME: HFCT1461A, 277 HUCKLEBERRY HILL ROAD

SHEET: ELECTRICAL DETAILS

URS
URS CORPORATION AES
600 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY:	JCF
DRAWN BY:	JES
DATE:	10/15/08
URS JOB NUMBER:	CPC1050/36923970
DRAWING NUMBER:	06

Exhibit C

Equipment Specifications

Pocket Site HFCT1481A

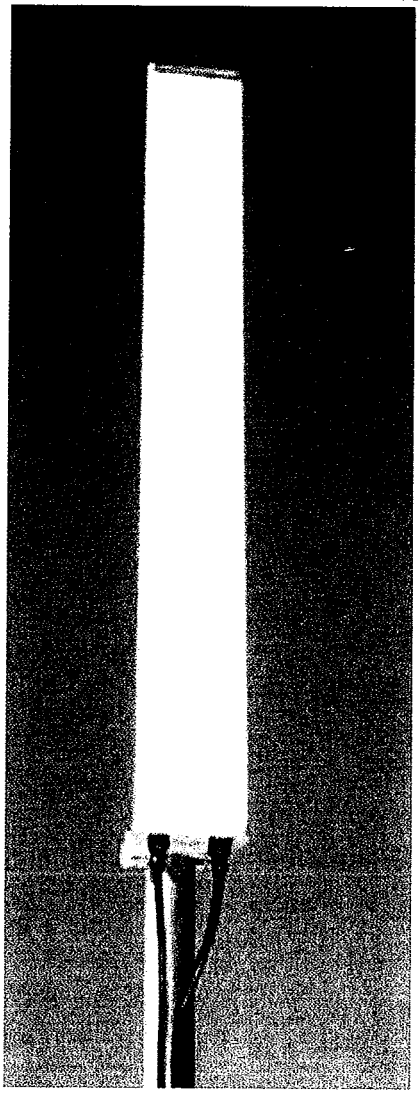
277 Huckleberry Hill Road

Avon, Connecticut

Technical Data Sheet APXV18-206517S-C

Product Description

This variable tilt antenna provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features null fill and a wide downtilt range with optional remote tilt.



Features/Benefits

- Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.
- High Suppression of all Upper Sidelobes (Typically <-20dB).
- Optional remote tilt - can be retrofitted.
- Broadband design.
- Dual polarization.
- Low profile for low visual impact.

Technical Features

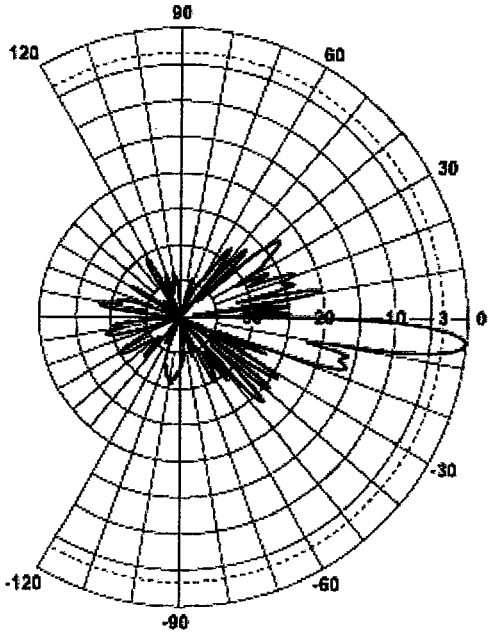
Frequency Band	3G/UMTS (Single, Broad, Dual and Triple-Band)
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable

Technical Data Sheet	APXV18-206517S-C

Gain, dBi (dBd)	18.8 (16.7) , 19.0 (16.9)
Frequency Range, MHz	1710-1900, 1900-2170
Connector Type	(2) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10
Horizontal Beamwidth, deg	67 , 63
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	5.0 , 4.6
Upper Sidelobe Suppression, dB	>17 , >18 all (Typically >20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	>30
Maximum Power Input, W	300
Isolation between Ports, dB	>30
Lightning Protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	>150
7th Order IMP @ 2x46 dBm, dBc	>170
Impedance, Ohms	50
Overall Length, m (ft)	1.85 (6.06)
Mounting Hardware Weight, kg (lb)	3.4 (7.5)
Dimensions - HxWxD, mm (in)	1850 x 175 x 80 (72.0 x 6.8 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	12 (26.4)
Weight w/ Mtg Hardware, kg (lb)	14.8 (32.5)
Radiating Element Material	Brass
Radome Color	Light Grey RAL7035
Radome Material	Fiberglass
Mounting Hardware Material	Diecasted Aluminum
Reflector Material	Aluminum
Max Wind Loading Area, m^2 (ft^2)	0.31 (3.3)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	558 (125)
Front Thrust @ Rated Wind, N (lbf)	558 (125)
Shipping Weight, kg (lb)	18.3 (39.8)
Packing Dimensions, HxWxD, mm (in)	2021 x 260 x 200 (79.5 x 10.2 x 7.8)
Packing Dimensions - HxWxD, m (ft)	2.0 x 0.26 x 0.2 (6.6 x 0.85 x 0.65)

Notes

For additional mounting information please click "External Document Link" below.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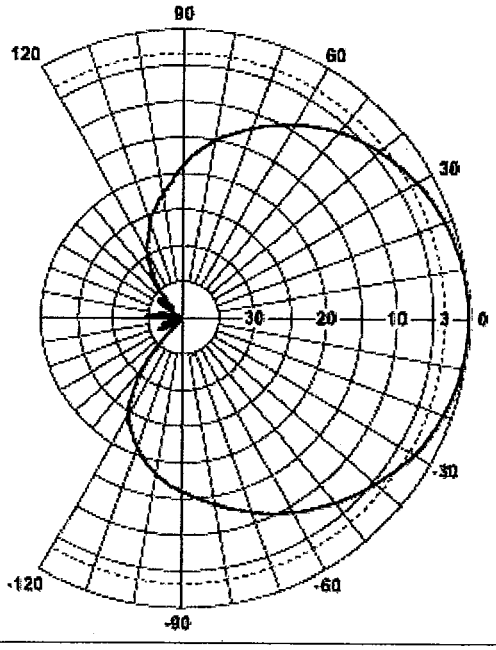
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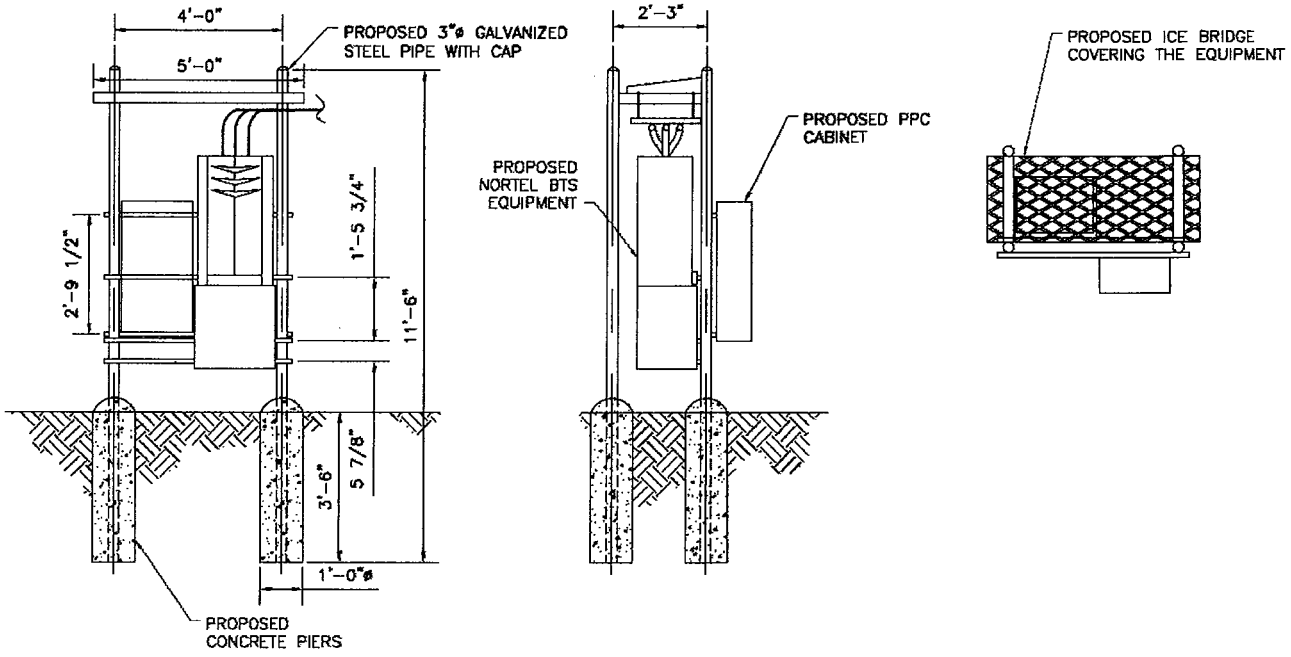


Pocket/Youghiogheny Communications – Northeast, LLC
Rack Detail

>BUSINESS MADE **SIMPLE**

NORTEL

CDMA BTS 3231 AWS 1.7/2.1 GHz (Outdoor/Indoor)

CDMA BTS 3231

Industry's Highest Capacity AWS Micro BTS

The CDMA BTS 3231 is the latest extension to Nortel Networks BTS (Base Transceiver Station) portfolio providing the ideal solution for urban, sub-urban and rural deployments. The CDMA BTS 3231 is a 3-carrier, 3-sector outdoor/indoor BTS operating at the AWS band of 1.7/2.1 GHz supporting IS-95, 1XRTT and 1xEV-DO simultaneously. BTS 3231 provides flexible deployments solutions including floor, rack, and wall mount options. The power consumption of BTS3231 is industry leading consuming only 630W for 3C3S. The BTS 3231 is also very light at 240lbs making it easy to transport to hard to reach locations such as the top of a high rise building.

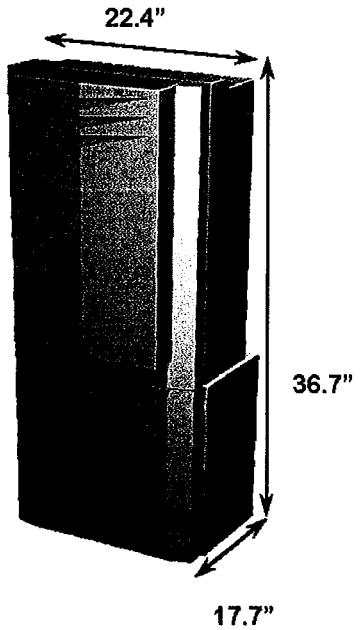


Exhibit D

Power Density Calculations

Pocket Site HFCT1481A

277 Huckleberry Hill Road

Avon, Connecticut

C Squared Systems, LLC
920 Candia Road
Manchester, NH 03109
Phone: (603) 657 9702
E-mail:
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT-1481 aka HFCT1481

277 Huckleberry Hill Road, Avon, CT

Table of Contents

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Pocket antennas to be installed on the existing tower at 277 Huckleberry Hill Road, Avon, CT.

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are much more conservative (higher) than the actual signal levels will be from the finished installation.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (mW/ cm^2). The number of mW/cm^2 emitted is called the power density. The general population exposure limit for the cellular band is 0.567-0.593 mW/ cm^2, and the general population exposure limit for the PCS/AWS band is 1.0 mW/ cm^2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

The FCC general population / uncontrolled limits set the maximum exposure to which most people may be subjected. General population / uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Higher exposure limits are permitted under the occupational / controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure (through training), and they must be able to exercise control over their exposure. General population / uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals."

The FCC describes exposure to radio frequency (RF) energy in terms of percentage of maximum permissible exposure (MPE) with 100% being the maximum allowed. Rather than the FCC presenting the user specification in terms of complex power density figures over a specified surface area, this MPE measure is particularly useful, and even more so when considering that power density limits actually vary by frequency because of the different absorptive properties of the human body at different frequencies.

MPE limits are specified as time-averaged exposure limits. This means that exposure can be averaged over 30 minutes for general population / uncontrolled exposure (or 6 minutes for occupational / controlled exposure). However, for the case of exposure of the general public, time averaging is usually not applied because of uncertainties over exact exposure conditions and difficulty in controlling time of exposure. Therefore, the typical conservative approach is to assume that any RF exposure to the general public will be continuous.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population / uncontrolled exposure and for occupational / controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include limits for Maximum Permissible Exposure (MPE) for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP), the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit. As shown in these excerpts, each frequency band has different exposure limits, requiring power density to be reported as a percent of Maximum Permissible Exposure (MPE) when dealing with carriers transmitting in different frequency bands.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{EIRP}{\pi \times R^2}\right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from bottom of antenna

Off Beam Loss is determined by the selected antenna patterns

4. Calculation Results

Table 1 below outlines the power density information for the site. All information for carriers other than Pocket was obtained from current CSC database.

Carrier	Number of Trans.	Effective Radiated Power (ERP) Per Transmitter (Watts)	Antenna Height (Feet)	Operating Frequency (MHz)	Total ERP (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Sprint	11	234.7	100	1962.5	2581.7	0.0928	1.0000	9.28%
AT&T	6	296	90	880	1776	0.0788	0.5867	13.44%
AT&T	3	427	90	1930	1281	0.0569	1.0000	5.69%
Pocket	3	631	80	2130-2133.75	1893	0.1942	1.0000	19.42%
							Total	47.83%

Table 1: Proposed Carrier Information

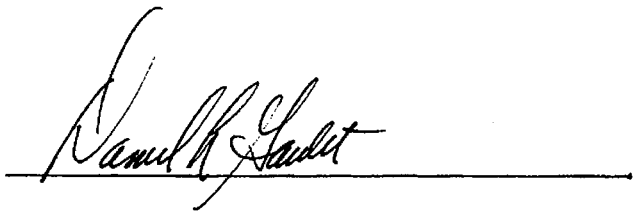
5. Conclusion

The above analysis verifies that emissions from the proposed site will be well below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 47.83% of the FCC limit.

As noted in the introduction, obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished installation.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



October 30, 2008
Date

Daniel l. Goulet
C Squared Systems, LLC

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits For Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure

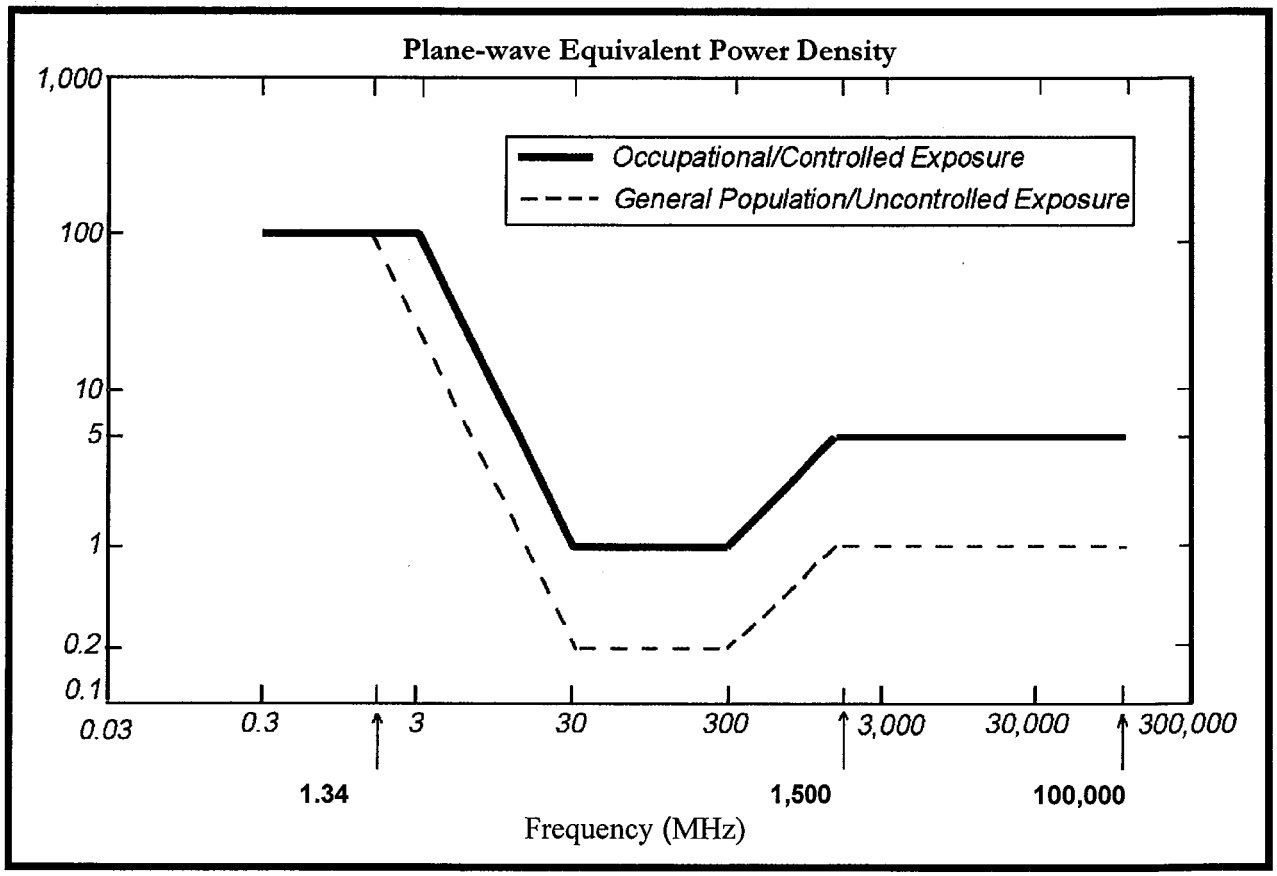
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.



• FCC Limits for Maximum Permissible Exposure (MPE)

Exhibit E

Structural Analysis

Pocket Site HFCT1481A

277 Huckleberry Hill Road

Avon, Connecticut

1079 N. 205th Street
Elkhorn, NE 68022
Ph: 402-289-1888
Fax: 402-289-1861

SEMAAN ENGINEERING SOLUTIONS

100 ft ELAM Laminated Wood Monopole
Structural Analysis

Prepared for:
TowerCo LLC
112 Towerview Court
Cary, NC 27513

Site: CT2020
Pocket Communications
Avon, CT

November 4, 2008

1079 N. 205th Street
Elkhorn, NE 68022
Ph: 402-289-1888
Fax: 402-289-1861

SEMAAN ENGINEERING SOLUTIONS

100 ft ELAM Laminated Wood Monopole
Structural Analysis

Prepared for:
TowerCo LLC
112 Towerview Court
Cary, NC 27513

Site: CT2020
Pocket Communications
Avon, CT

November 4, 2008

Mr. Stephen Rambeau
TowerCo LLC
112 Towerview Court
Cary, NC 27513

Re: Site Number CT2020 – Avon, CT.

Dear Mr. Rambeau:

We have completed the structural analysis for the existing monopole, located at the above referenced site. The purpose of this analysis is to determine that the existing monopole design is in conformance with the TIA/EIA-222 Rev F standard and local building codes for the proposed antennae loads installation. Refer to the Review and Recommendations section at the end of this report for the analysis results.

Description of Structure:

The structure is a 100 ft ELAM laminated wood monopole.

Refer to ELAM drawing SPSM-0079.06A1 Rev 3 dated July 29, 2005 for a detailed description of the structure.

Method of analysis:

The tower was analyzed using Semaan Engineering Solutions' software suite for communication structures. The structural analysis is performed using the SAPS finite element engine. The method is 3D, non-linear, which accounts for the second order geometric effects due to the displacements. It also treats guys as exact cable elements and therefore is ideal for guyed towers. The analysis was performed in conformance with TIA/EIA-222 Rev F and local building codes for a basic wind speed of 80 mph and 1/2" radial ice with reduced wind speed (fastest mile). This is in conformance with the IBC 2006: Section 1609.1.1, Exception (4) and Section 3108.4. Wind is applied to the structure, accessories and antennas.

Structure loading:

The following loads were used in the tower analysis:

Elev (ft)	Qty	Antennas	Mounts	Coax	Carrier
100.0	3	RR90-17-00DP	Flush mounts	(12) 1 5/8	Sprint
90.0	6	21401 TMA	Flush mounts	-	Cingular
	3	Powerwave 7770		(12) 1 5/8	

Proposed Loads:

Elev (ft)	Qty	Antennas	Mounts	Coax	Carrier
80.0	3	APXV18-206517	Flush mounts	(6) 1 5/8	Pocket Communications

All transmission lines are assumed running outside of the pole shaft with (4) lines exposed to the wind beyond the profile of the monopole.

Results of Analysis:

Refer to the attached Computer Summary sheets for detailed analysis results.

Structure:

The existing monopole is structurally capable of supporting the existing and proposed antennas.
The maximum structure usage is: 100.6%.

Foundation:

Pole Reactions	Original Design Reactions	Current Analysis Reactions	% Of Design
Moment (ft-kips)	724.60	739.48	102.1

The reactions calculated from the analysis exceed the ones indicated on the original structural design. However, upon reviewing the foundation documents, they were found to be adequate and therefore the foundation will not require modification.

Review and Recommendations:

Based on the analysis results, the existing structure meets the requirements per the TIA/EIA-222 Rev F standards for a basic wind speed of 80 mph and 1/2" radial ice with reduced wind speed.

Wood Pole Spreadsheet (no ice)

Site # CT33XC589 / CT2020

Address 227 Huckleberry St., Avon, CT

Pole class =

Pole Parameters

Width (trans) (in) =	26.25
Top Depth (long) (in) =	12
Bottom Depth (long) (in) =	30.25
AGL Height (ft) =	100
BGL Embed (ft) =	17.5
Wood Species =	
S_{bot} (trans) (in^3) =	4003.4
S_{bot} (long) (in^3) =	3474.0

Wind Loads

wind pressure (psf) = 41.54 (80/85)^2x46.9 = 41.54 for 80 mph

Item	area (sf)	CL elev (ft)	force (lbs)	moment (ft-lbs)
Pole (long)	176.04	42.80	7313	312992
Pole (trans)	218.75	50.00	9087	454344
Sprint (3x5.23/1.4)	14.02	100.00	582	58239
Cingular ((3x5.88+6x.95)/1.4)	16.67	90.00	692	62322
Pocket(3x5.024x.73/1.4)	7.86	80.00	327	26120
Coax (4 1-5/8 exposed)	66.66	50.00	2769	138453
Total (long) =			**11683**	**598127**
Total (trans) =			**13457**	**739478**

f_b (long) (psi) =	2066	
f_b (trans) (psi) =	2217	
Allow. Long. Bend. Stress (psi) =	2053	100.6%
Allow. Trans. Bend Stress (psi) =	2500	88.7%

Site:	CT33XC589 / CT2020
M (ft-lbs) =	739478
V (lbs) =	13457.0
h (ft) =	54.95
Allow. Lateral brg. Pressure (psf) =	400
Embedment depth (ft) =	17.50
S_1 =	2333
b (ft) =	5.00
A =	2.70
Min. embed depth (ft) =	15.41