



Daniel F. Caruso
Chairman

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

August 20, 2008

Steven Levine
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-018-080709** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 2 Huckleberry Hill Road, Brookfield, Connecticut.

Dear Mr. Levine:

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.

The proposed modifications are to be implemented as specified here and in your notice dated July 9, 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/MP/cm

c: The Honorable Robert G. Silvaggi, First Selectman, Town of Brookfield
Clare Ann Walsh, Land Use Enforcement Officer, Town of Brookfield



CONNECTICUT SITING COUNCIL
Affirmative Action / Equal Opportunity Employer



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Daniel F. Caruso
Chairman

July 9, 2008

The Honorable Robert G. Silvaggi
First Selectman
Town of Brookfield
Brookfield Municipal Center
Pocono Road
P. O. Box 5106
Brookfield, CT 06804-5106

RE: **EM-CING-018-080709** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 2 Huckleberry Hill Road, Brookfield, Connecticut.

Dear Mr. Silvaggi:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by July 23, 2008.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Clare Ann Walsh, Land Use Enforcement Officer, Town of Brookfield
Heather Paton, Land Use Office, Town of Brookfield



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

EM-CING-018-080709

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

July 9, 2008

RECEIVED
JUL 9 - 2008

Honorable Daniel F. Caruso, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

CONNECTICUT
SITING COUNCIL

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 2 Huckleberry Hill Road, Brookfield (owner, New Cingular Wireless)

Dear Chairman Caruso and Members of the Council:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile (GSM) communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility

will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Modifications to the existing site include all or some of the following as necessary to bring the site into conformance with the plan:

- Replacement of existing panel antennas with new antennas or, installation of additional antennas of a size required to accommodate UMTS.
- Installation of small tower mount amplifiers ("TMA's") and/or diplexers to the platform on which the panel antennas are mounted to enhance signal reception.
- Installation of additional or larger coaxial cables as required.
- Installation of an additional equipment cabinet in existing shelters, or on existing or enlarged concrete pads.
- Radome enlargement for flagpole and "stick" structures to accommodate larger antennas and additional associated equipment.

None of these modifications will extend the height of the tower.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

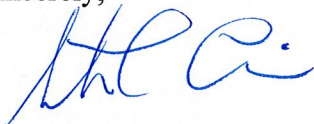
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 513-7636 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

Attachments

**CINGULAR WIRELESS
Equipment Modification**

2 Huckleberry Hill Road, Brookfield
Site Number 5075
Former AT&T Cell Site
Petition 616

Tower Owner/Manager: AT&T Wireless

Equipment configuration: Flagpole

Current and/or approved: 18-inch diameter flagpole
Three Allgon 7250 panel antennas @ 57 ft c.l.
Three Allgon 7250 panel antennas @ 51 ft c.l.
Twelve runs 7/8 inch coax

Planned Modifications: Remove all six existing antennas
Replace top 12 ft of flagpole (RF-transparent radome) with
28-inch diameter radome to accommodate Powerwave
antennas & associated equipment
Install six Powerwave 7770 antennas (3 @ 57 ft and 3 @ 51 ft)
Install six TMA's (3 @ 57 ft and 3 @ 51 ft)
Install six diplexers (3 @ 57 ft and 3 @ 51 ft)
Remove one existing outdoor cabinet
Install one new outdoor cabinet for UMTS

Power Density:

Calculations for AT&T's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 27.5 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for AT&T's planned operations would be approximately 48.8 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *							0.00
AT&T GSM*	55	1900 Band	4	250	0.1189	1.0000	11.89
AT&T GSM*	48	1900 Band	4	250	0.1561	1.0000	15.61
Total							27.5%

* Per CSC records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *							0.00
AT&T GSM	57	1900 Band	4	427	0.1890	1.0000	18.90
AT&T GSM	57	880 - 894	2	296	0.0655	0.5867	11.17
AT&T UMTS	51	880 - 894	1	500	0.0691	0.5867	11.78
AT&T UMTS	51	1900 Band	1	500	0.0691	1.0000	6.91
Total							48.8%

* Per CSC records.

Structural information:

The attached structural analysis demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed modifications. (DaVinci Engineering, dated 6/18/08)

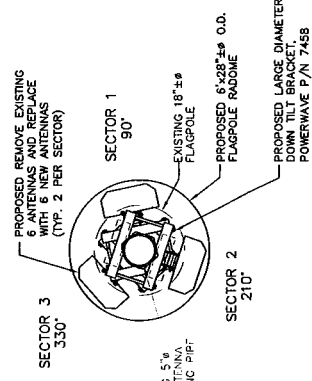
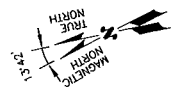
RF TABLE

SECTOR NAME	ANTENNA MAKE & MODEL	ANTENNA COUNT	AZIMUTH	RAD CENTER	MECHANICAL DOWN TILT	TWA COUNT	DUPLEXER COUNT	# OF COAX CABLES
1	ALPHA POWERWAVE 7770	2 PROPOSED 0 EXISTING	90°	57'± & 51'±	0*	2 PROPOSED 0 EXISTING	2 PROPOSED 0 EXISTING	0 PROPOSED 4 EXISTING
2	BETA POWERWAVE 7770	2 PROPOSED 0 EXISTING	210°	57'± & 51'±	0*	2 PROPOSED 0 EXISTING	2 PROPOSED 0 EXISTING	0 PROPOSED 4 EXISTING
3	GAMMA POWERWAVE 7770	2 PROPOSED 0 EXISTING	330°	57'± & 51'±	0*	2 PROPOSED 0 EXISTING	2 PROPOSED 0 EXISTING	0 PROPOSED 4 EXISTING

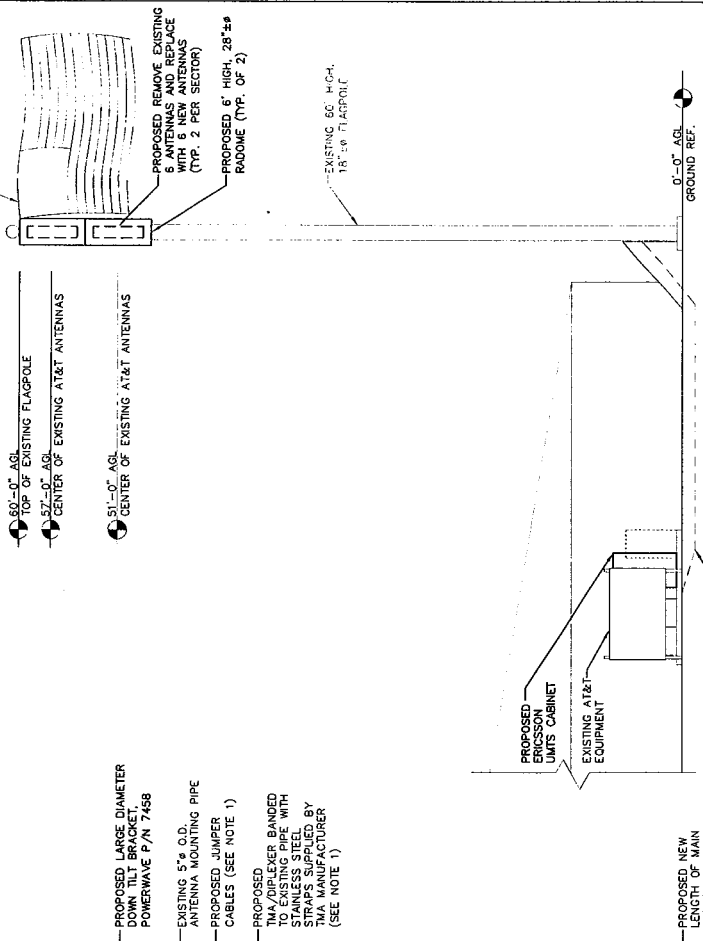
NOTE:
1. CONTRACTOR TO VERIFY PROPOSED ANTENNAS WILL FIT INSIDE FLAGPOLE.
2. BOM, TRUCK OR MANUAL REQUIRED TO INSTALL ANTENNAS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



PROPOSED ANTENNA PLAN VIEW
SCALE: N.T.S.



PROPOSED ANTENNA DETAIL
SCALE: 1" = 1'-0"

WEST ELEVATION
SCALE: 3/16" = 1'-0"

PROPOSED ANTENNA PLAN VIEW
SCALE: 1" = 1'-0"

WEST ELEVATION
SCALE: 3/16" = 1'-0"

184 ROCKINGHAM ROAD, UNIT A
LONGMEADOW, NH 03255

184 ROCKINGHAM ROAD, UNIT A
LONGMEADOW, NH 03255

SITE NUMBER: 5075
SITE NAME: BROOKFIELD WEST
2 HUCKLEBERRY HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

AT&T

ANTENNA LAYOUT AND ELEVATION

DATE: 05/15/08
BY: JAC/DPK
CHECKED: 05/15/08
BY: JAC/DPK
DESIGNED: 05/15/08
BY: JAC/DPK
SCALE: AS SHOWN
DRAWN BY: JC
JOB NUMBER: 5075.01
A-2



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

Steven L. Levine
Real Estate Consultant

July 9, 2008

Honorable Robert G. Silvaggi
1st Selectman, Town of Brookfield
Brookfield Municipal Center, 100 Pocono Rd.
Brookfield, CT 06804

Re: Telecommunications Facility – 2 Huckleberry Hill Road, Brookfield

Dear Mr. Silvaggi:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“Cingular”) will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular’s proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular’s proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council’s procedures, please call me at (860) 513-7636 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Structural Analysis Report 60-Ft. Flag Pole

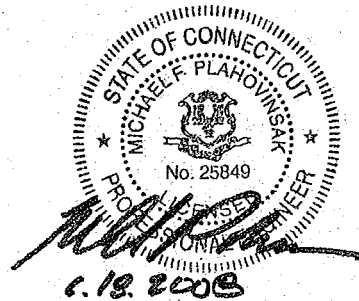
Prepared for:
Cingular Wireless / AT&T
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06467

Site Location: Fairfield Co., CT
Site Name: #5075 – West Brookfield

Calculations Prepared by:
Davinci Engineering inc.

Job # 08242-1273
Valmont PennSummit #70179/20183
Date: 6/18/08

Reviewing Engineer:
Michael F. Plahovinsak, P.E.



Davinci Engineering inc.

PO Box 1966
Santa Maria, California 93456
Ph: 805-922-5221 Fax: 805-880-0402

PO Box 66
110 W. Main St. Unionville Center, OH 43077
Ph: 614-937-4922 Fax: 614-413-2887

www.davinci-engineering.com

Project Objectives:

DaVinci Engineering has been contracted to provide a structural analysis of an existing monopole (flag pole) located in Fairfield Co., Connecticut. The monopole was analyzed for the addition of new panel antennas located within a new 28" diameter x 12' antenna shroud as shown on page 3 of this report.

As indicated in the conclusions, the existing monopole and foundation structures have been found to have adequate strength to support both the existing and proposed antenna loading. No structural modifications are required at this time.

Fieldwork / Site Visit:

No fieldwork has been performed by DaVinci Engineering under the current work scope.

Documents and Resources Provided:

Our structural analysis has been based solely on the following information provided:

Resource	Source	Job Number	Date
Base Pole & Foundation Drawings	Paul J. Ford & Co.	29203-152	06/06/01
Construction Drawings	AT&T		05/15/08

Structure History and Specifics:

Structure Manufacturer:	PennSummit Tubular
Manufacture Date:	2003
Original Job/File Number:	PST #20183
Original Design Code:	TIA-222-F 1996
Original Design Wind:	85 mph / 74 mph + 1/2" ice
Current Analysis Code:	IBC 2006 / TIA-222-G 2006 / 110 mph / 50 mph + 1/2" ice

The State of Connecticut has adopted the International Building Code (IBC). According to IBC section 3108, towers shall be designed to resist wind loads in accordance with TIA/EIA-222. The most current version of the IBC references TIA-222-G.

DaVinci Engineering inc.

PO Box 1966
Santa Maria, California 93456
Ph: 805-922-5221 Fax: 805-880-0402

PO Box 66
110 W. Main St. Unionville Center, OH 43077
Ph: 614-937-4922 Fax: 614-413-2887

Antenna / Coax Loading:

The following loading has been considered on the pole. Any loads that are not identified in the following list were ***not*** considered in the structural analysis. Please contact DaVinci Engineering if there is a discrepancy in the antenna loading as identified, or if additional load cases are desired.

Status	Elevation (ft)	Antenna / Equipment
Existing	60	12' x 18' Flag
		Standard Flag Mounting Kit
Proposed	57	(3) Powerwave 7770 Panel w/ (6) LGP21401 TMA's & (6) LGP13519 Diplexers
		6' x 28" Dia. Antenna Concealment Cylinder
Proposed	51	(3) Powerwave 7770 Panel w/ (6) LGP21401 TMA's & (6) LGP13519 Diplexers
		6' x 28" Dia. Antenna Concealment Cylinder

All antennas and coax assumed internally mounted, not exposed to the wind.

Conclusion:

DaVinci Engineering has completed a structural analysis of the existing monopole and foundation in accordance with the project specifics outlined above. Our analysis indicates that the existing monopole and foundation is stressed to 72% of its safe capacity when considering the existing plus proposed loading. Please refer to the attached calculations for an itemized listing of all member stress ratios. The existing pole is safe and adequate to support the proposed loads, and no structural reinforcing is required to support the above loading.

If you have any questions about the contents of this structural report or require any additional information, please feel free to contact our office.

Sincerely,
DaVinci Engineering, Inc.



Michael F. Plahovinsak, P.E.
mike.p@davinci-engineering.com

DaVinci Engineering inc.

PO Box 1966
Santa Maria, California 93456
Ph: 805-922-5221 Fax: 805-880-0402

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110 W. Main St. Unionville Center, OH 43077
Ph: 614-937-4922 Fax: 614-413-2887

**Standard Conditions for Providing Structural Consulting
Services on Existing Structures**

1. The following standard conditions are a general overview of key issues regarding the work product supplied by DaVinci Engineering. Refer to DaVinci Engineering document "Scope of Work – Existing Tower Structures" for a detailed explanation of the scope of work that we have performed.
2. If the existing conditions are not as represented in this structural report or attached sketches, DaVinci Engineering should be contacted to evaluate the significance of the deviation and revise the structural assessment accordingly.
3. The structural analysis has been performed assuming that the structure is in "like new" condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, etc. If there are any known deficiencies in the structure that potentially compromise structural integrity, DaVinci Engineering should be made aware of the deficiencies. If DaVinci Engineering is aware of a deficiency that exists in a structure at the time of our analysis, a general explanation of the structural concern due to the deficiency will be included in the structural report, but the deficiency will not be reflected in capacity calculations.
4. The structural analysis provided by DaVinci Engineering is an assessment of the primary load carrying capacity of the structure. DaVinci Engineering provides a limited scope of service in that we have not verified the capacity of every weld, plate, connection detail, etc. In most cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurement of this information is beyond the scope of our services. In instances where DaVinci Engineering has not performed connection capacity calculations, it is assumed that existing manufactured connections develop the full capacity of the primary members being connected.
5. The structural integrity of the existing foundation system can only be verified if exact foundation sizes and soils conditions are known. DaVinci Engineering will not accept any responsibility for the adequacy of the existing foundations unless this site-specific data is supplied.
6. Miscellaneous items such as antenna mounts, coax supports, etc. have not been designed, detailed, or specified as part of our work. It is assumed that material of adequate size and strength will be purchased from a reputable component manufacturer. The attached report and sketches are schematic in nature and should not be used to fabricate or purchase hardware and accessories to be attached to the structure. DaVinci Engineering recommends field measurement of the structure before fabricating or purchasing new hardware and accessories. DaVinci Engineering is not responsible for proper fit and clearance of hardware and accessory items in the field.
7. The structural analysis has been performed considering minimum code requirements or recommendations. If alternate wind, ice, or deflection criteria are to be considered, then DaVinci Engineering shall be made aware of the alternate criteria.

DaVinci Engineering inc.

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Santa Maria, California 93456
Ph: 805-922-5221 Fax: 805-880-0402

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110 W. Main St. Unionville Center, OH 43077
Ph: 614-937-4922 Fax: 614-413-2887

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' x 18' Flag	60	Radome Cylinder (28"Ø x 6'-0")	51
Radome Cylinder (28"Ø x 6'-0")	57	(3) Powerwave 7770	51
(3) Powerwave 7770	57	(3) TMA	51
(3) TMA	57	(3) Diplexer	51
(3) Diplexer	57		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

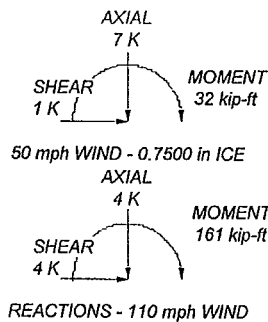
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. TOWER RATING: 71.7%

Section	1
Length (ft)	48.00
Number of Sides	18
Thickness (in)	0.1875
Top Dia (in)	18.0000
Bot Dia (in)	18.0000
Grade	A607-65
Weight (K)	1.7

48.0 ft

0.0 ft



REACTIONS - 110 mph WIND

BASE PLATE: 1.75" x 22" SQUARE (55 KSI)
ANCHOR BOLTS: (4) 2.25" DIA ON 23" B.C

ANSI/TIA-222-G CLASSIFICATION	
EXPOSURE CATEGORY	C
STRUCTURE CLASS	II
TOPOGRAPHY CATEGORY	1
CREST HEIGHT	

DaVinci Engineering, Inc. Job: **60-ft Flag Pole - DaVinci #08242-1273**
 P.O. Box 66
 Unionville Center, OH 43077
 Phone: 614.937.4922
 FAX: 614.413.2887

Project: #5075, Brookfield West
 Client: Valmont PennSummit (70179 / 20183) Drawn by: MFP App'd:
 Code: TIA-222-G Date: 06/18/08 Scale: NTS
 Path: G:\csed\Tower\Project\242-PennSummit\08242-1273\08242-1273.dwg Dwg No. E-1

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job 60-ft Flag Pole - DaVinci #08242-1273	Page 1 of 7
	Project #5075, Brookfield West	Date 09:21:59 06/18/08
	Client Valmont PennSummit (70179 / 20183)	Designed by MFP

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in Fairfield County, Connecticut.
- Basic wind speed of 110 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feedline Torque Include Angle Block Shear Check Use Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	48.00-0.00	48.00		18	18.0000	18.0000	0.1875	0.7500	A607-65 (65 ksi)

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	60-ft Flag Pole - DaVinci #08242-1273	Page	2 of 7
	Project	#5075, Brookfield West	Date	09:21:59 06/18/08
	Client	Valmont PennSummit (70179 / 20183)	Designed by	MFP

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	J in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q ₂ in ²	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 48.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
7/8"	C	No	Inside Pole	48.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.33 0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	48.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.19

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	48.00-0.00	A	1.459	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.19

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	60-ft Flag Pole - DaVinci #08242-1273	Page	3 of 7
	Project	#5075, Brookfield West	Date	09:21:59 06/18/08
	Client	Valmont PennSummit (70179 / 20183)	Designed by	MFP

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
12' x 18' Flag	C	None			0.0000	60.00	No Ice 8.46	8.46	0.10
							1/2" Ice 8.46	8.46	0.20
							1" Ice 8.46	8.46	0.30
Radome Cylinder (28"Ø x 6'-0")	C	None			0.0000	51.00	No Ice 11.20	11.20	0.53
							1/2" Ice 11.76	11.76	0.65
							1" Ice 12.33	12.33	0.78
(3) Powerwave 7770	C	None			0.0000	51.00	No Ice 0.00	0.00	0.04
							1/2" Ice 0.00	0.00	0.07
							1" Ice 0.00	0.00	0.11
(3) TMA	C	None			0.0000	51.00	No Ice 0.00	0.00	0.01
							1/2" Ice 0.00	0.00	0.01
							1" Ice 0.00	0.00	0.01
(3) Diplexer	C	None			0.0000	51.00	No Ice 0.00	0.00	0.01
							1/2" Ice 0.00	0.00	0.01
							1" Ice 0.00	0.00	0.01

Radome Cylinder (28"Ø x 6'-0")	C	None			0.0000	57.00	No Ice 11.20	11.20	0.53
							1/2" Ice 11.76	11.76	0.65
							1" Ice 12.33	12.33	0.78
(3) Powerwave 7770	C	None			0.0000	57.00	No Ice 0.00	0.00	0.04
							1/2" Ice 0.00	0.00	0.07
							1" Ice 0.00	0.00	0.11
(3) TMA	C	None			0.0000	57.00	No Ice 0.00	0.00	0.01
							1/2" Ice 0.00	0.00	0.01
							1" Ice 0.00	0.00	0.01
(3) Diplexer	C	None			0.0000	57.00	No Ice 0.00	0.00	0.01
							1/2" Ice 0.00	0.00	0.01
							1" Ice 0.00	0.00	0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	60-ft Flag Pole - DaVinci #08242-1273	Page	4 of 7
	Project	#5075, Brookfield West	Date	09:21:59 06/18/08
	Client	Valmont PennSummit (70179 / 20183)	Designed by	MFP

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	48 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-6.78	0.00	0.00
			Max. M _x	4	-4.05	-160.89	0.00
			Max. M _y	2	-4.05	0.00	160.89
			Max. V _y	4	4.10	-160.89	0.00
			Max. V _x	2	-4.10	0.00	160.89

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	8	6.78	0.00	0.00
	Max. H _x	14	3.38	0.00	-0.68
	Max. H _z	3	3.04	0.00	4.09
	Max. M _x	2	160.89	0.00	4.09
	Max. M _z	4	160.89	-4.09	0.00
	Max. Torsion	1	0.00	0.00	0.00
	Min. Vert	3	3.04	0.00	4.09
	Min. H _x	5	3.04	-4.09	0.00
	Min. H _z	7	3.04	0.00	-4.09
	Min. M _x	6	-160.89	0.00	-4.09
	Min. M _z	1	0.00	0.00	0.00
	Min. Torsion	1	0.00	0.00	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	3.38	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	4.06	0.00	-4.09	-160.89	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	3.04	0.00	-4.09	-159.96	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	4.06	4.09	0.00	0.00	-160.89	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	3.04	4.09	0.00	0.00	-159.96	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	4.06	0.00	4.09	160.89	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	3.04	0.00	4.09	159.96	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp	6.78	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	6.78	0.00	-0.89	-31.53	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	6.78	0.89	0.00	0.00	-31.53	0.00

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	Page
	60-ft Flag Pole - DaVinci #08242-1273	5 of 7
	Project	Date
#5075, Brookfield West	09:21:59 06/18/08	
Client	Designed by	
Valmont PennSummit (70179 / 20183)	MFP	

Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	6.78	0.00	0.89	31.53	0.00	0.00
Dead+Wind 0 deg - Service	3.38	0.00	-0.68	-26.67	0.00	0.00
Dead+Wind 90 deg - Service	3.38	0.68	0.00	0.00	-26.67	0.00
Dead+Wind 180 deg - Service	3.38	0.00	0.68	26.67	0.00	0.00

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-3.38	0.00	0.00	3.38	0.00	0.000%
2	0.00	-4.06	-4.09	0.00	4.06	4.09	0.002%
3	0.00	-3.04	-4.09	0.00	3.04	4.09	0.002%
4	4.09	-4.06	0.00	-4.09	4.06	0.00	0.002%
5	4.09	-3.04	0.00	-4.09	3.04	0.00	0.002%
6	0.00	-4.06	4.09	0.00	4.06	-4.09	0.002%
7	0.00	-3.04	4.09	0.00	3.04	-4.09	0.002%
8	0.00	-6.78	0.00	0.00	6.78	0.00	0.000%
9	0.00	-6.78	-0.89	0.00	6.78	0.89	0.003%
10	0.89	-6.78	0.00	-0.89	6.78	0.00	0.003%
11	0.00	-6.78	0.89	0.00	6.78	-0.89	0.003%
12	0.00	-3.38	-0.68	0.00	3.38	0.68	0.002%
13	0.68	-3.38	0.00	-0.68	3.38	0.00	0.002%
14	0.00	-3.38	0.68	0.00	3.38	-0.68	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00000001	0.00008818
3	Yes	10	0.00000001	0.00007091
4	Yes	10	0.00000001	0.00008818
5	Yes	10	0.00000001	0.00007091
6	Yes	10	0.00000001	0.00008818
7	Yes	10	0.00000001	0.00007091
8	Yes	6	0.00000001	0.00000001
9	Yes	9	0.00000001	0.00006824
10	Yes	9	0.00000001	0.00006824
11	Yes	9	0.00000001	0.00006824
12	Yes	9	0.00000001	0.00007953
13	Yes	9	0.00000001	0.00007953
14	Yes	9	0.00000001	0.00007953

Maximum Tower Deflections - Service Wind

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	Page
	60-ft Flag Pole - DaVinci #08242-1273	6 of 7
	Project	Date
#5075, Brookfield West	09:21:59 06/18/08	
Client	Designed by	
Valmont PennSummit (70179 / 20183)	MFP	

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	2.758	13	0.4173	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
60.00	12' x 18' Flag	13	2.758	0.4173	0.0000	Inf
57.00	Radome Cylinder (28"Ø x 6'-0")	13	2.758	0.4173	0.0000	Inf
51.00	Radome Cylinder (28"Ø x 6'-0")	13	2.758	0.4173	0.0000	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	16.639	2	2.5184	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
60.00	12' x 18' Flag	2	16.639	2.5184	0.0000	Inf
57.00	Radome Cylinder (28"Ø x 6'-0")	2	16.639	2.5184	0.0000	Inf
51.00	Radome Cylinder (28"Ø x 6'-0")	2	16.639	2.5184	0.0000	Inf

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	48 - 0 (1)	TP18x18x0.1875	48.00	0.00	0.0	10.6007	-4.05	620.14	0.007

Pole Bending Design Data

RISATower DaVinci Engineering, Inc. P.O. Box 66 Unionville Center, OH 43077 Phone: 614.937.4922 FAX: 614.413.2887	Job	60-ft Flag Pole - DaVinci #08242-1273	Page	7 of 7
	Project	#5075, Brookfield West	Date	09:21:59 06/18/08
	Client	Valmont PennSummit (70179 / 20183)	Designed by	MFP

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} kip-ft	ϕM_{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	48 - 0 (1)	TP18x18x0.1875	160.89	226.55	0.710	0.00	226.55	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	48 - 0 (1)	TP18x18x0.1875	4.10	186.08	0.022	0.00	21632.17	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	48 - 0 (1)	0.007	0.710	0.000	0.022	0.000	0.717	1.000	4.10-1a ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	48 - 0	Pole	TP18x18x0.1875	1	-4.05	620.14	71.7	Pass
Summary								
Pole (L1)							71.7	Pass
RATING =							71.7	Pass

Monopole Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G 2005

Factored Base Reactions:

Moment: 161 ft-kips
 Shear: 4 kips
 Axial: 4 kips

Pole Shape:

18-Sided
 Pole Dia. (D_p):
 18.00 in

Anchor Rods:

(4) 2.25 in. A615 GR. 75
 Anchor Rods in Quadrants
 On a 23 in Bolt Circle

Base Plate:

1.75 in. x 22 in. Square
 $f_y = 55$ ksi

Anchor Rod Calculation According to TIA-222-G section 4.9.9

$\phi = 0.80$ (A 4.9.9)
 $I_{bolts} = 264.50$ in² Moment of Inertia
 $P_u = 84.00$ kips Tension Force
 $V_u = 1.00$ kips Shear Force
 $R_{nt} = 325.00$ kips Nominal Tensile Strength
 $\eta = 0.50$ for detail type (d)

The following Interaction Equation Shall Be Satisfied:

$$\left(\frac{P_u + \frac{V_u}{\eta}}{\phi R_{nt}} \right) \leq 1.0$$

$$0.331 \leq 1$$

Base Plate Calculation According to TIA-222-G

$\phi = 0.90$ (A 4.7)
 $M_{PL} = 212.5$ in-kip Plate Moment
 $L = 13.113$ in Section Length
 $Z = 10.039$ Plastic Section Modulus
 $M_p = 552.17$ in-kip Plastic Moment
 $\phi M_n = 496.95$ in-kip Factored Resistance

Calculated Moment vs Factored Resistance

$$212.5 \text{ in-kip} \leq 497 \text{ in-kip}$$

Anchor Rods Are Adequate	33.1%
Base Plate Is Adequate	42.8%

