

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

June 26, 2009

Thomas J. Regan, Esq.
Brown Rudnick LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **EM-T-MOBILE-132-090526** - T-Mobile USA, Inc. notice of intent to modify an existing telecommunications facility located at 300 Governors Highway, South Windsor, Connecticut.

Dear Attorney Regan:

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 May 26, 2009, 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/laf

c: The Honorable Matthew Streeter, Mayor, Town of South Windsor
Matthew B. Galligan, Town Manager, Town of South Windsor
Marcia Banach, Director of Planning, Town of South Windsor
Hans Fiedler, T-Mobile USA, Inc.

THOMAS J. REGAN
Direct Dial: (860) 509-6522
tregan@brownrudnick.com

CityPlace I
185 Asylum
Street
Hartford
Connecticut
06103
tel 860.509.6500
fax 860.509.6501

Via Hand Delivery

May 26, 2009

Daniel F. Caruso, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RECEIVED
MAY 26 2009
CONNECTICUT
SITING COUNCIL

RE: T-Mobile USA, Inc - Exempt Modification

Dear Mr. Caruso:

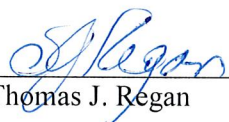
On behalf of T-Mobile USA, Inc., enclosed for filing are an original and five (5) copies of a Notice to Make an Exempt Modification to an Existing Facility at 300 Governors Highway in South Windsor.

I have also enclosed a sixth copy of the Notice which I would like to have date-stamped and returned to the courier delivering this package.

Also enclosed is a check in the amount of \$500.00 to cover the filing fee. If you have any questions, please feel free to contact me.

Very truly yours,

BROWN RUDNICK BERLACK ISRAELS LLP

By: 
Thomas J. Regan

TJR/bh
Enclosures

40260286 v1 - REGANTJ - 025064/0016



Daniel F. Caruso, Chairman
May 26, 2009
RE: T-Mobile USA, Inc. - Exempt Modification
Page 2

cc/encls: via 1st Class Mail:

The Honorable Cary Prague, Mayor
Town of South Windsor
Town Hall
1540 Sullivan Avenue
South Windsor, CT 06074

CONNECTICUT

EM-T-MOBILE-132-090526

In re:

T-Mobile USA, Inc. Notice to Make an Exempt
Modification to an Existing Facility at 300
Governors Highway, South Windsor, Connecticut.

EXEMPT MODIFICATION NO. _____

RECEIVED
MAY 26 2009
CONNECTICUT
SITING COUNCIL

NOTICE OF EXEMPT MODIFICATION 26 2009

ORIGINAL

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc.

("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of South Windsor of T-Mobile's intent to make an exempt modification to an existing monopole (the "Tower") located at 300 Governors Highway in South Windsor, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") technology that utilizes a code division multiple access ("CDMA") base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance Global Positioning System ("GPS") navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS technology is compatible with the existing second-generation ("2G") Global System for Mobile Communication ("GSM") currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile plans to add UMTS technology and install associated electronic equipment at the base of the Tower.

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not change

the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 169-foot monopole located at 300 Governors Highway in South Windsor, Connecticut (41.8335, -72.6031). There are multiple carriers on the Tower. The Tower is owned by T-Mobile. Currently, T-Mobile has 3 antennas and 3 Tower Mounted Amplifiers (“TMA”) located on the Tower with a centerline of 172 feet. A site plan with Tower specifications is attached.

~~T-Mobile plans to add 3 UMTS antennas and add 3 UMTS Twin TMA to the Tower. The~~ proposed antennas and TMA will have the same centerline as the existing antennas and TMA – 172 feet. To confirm the Tower can support these changes, T-Mobile commissioned Armor Tower to perform a structural analysis of the Tower (attached). According to the structural analysis, dated May 18, 2009, “...the tower and the foundations [are] acceptably loaded ... to support the proposed antenna loading” (Page 1, Structural Analysis).

In addition, T-Mobile plans to locate 6, 1-5/8 inch coax cables under the proposed ice bridge. T-Mobile proposes to install the UMTS equipment cabinet on the existing steel platform located under the Tower. Hence, no increase in the size of the steel platform is necessary. T-Mobile also plans to install telephone wiring and power wiring to run inside the proposed underground conduit to the proposed equipment cabinet.

Therefore, excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile’s changes to the Tower will not increase noise levels at the site.

The proposed antennas and TMA will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The worst-case power density analysis measured at the base of the Tower indicates that T-Mobile's antennas will emit 1.92% of the NCRP's standard for maximum permissible exposure. A cumulative power density analysis indicates that together, all of the antennas on the Tower will emit only 48.67% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to add antennas and TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By: 

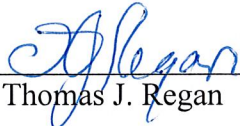
Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522
Fax - 860.509.6622

Certificate of Service

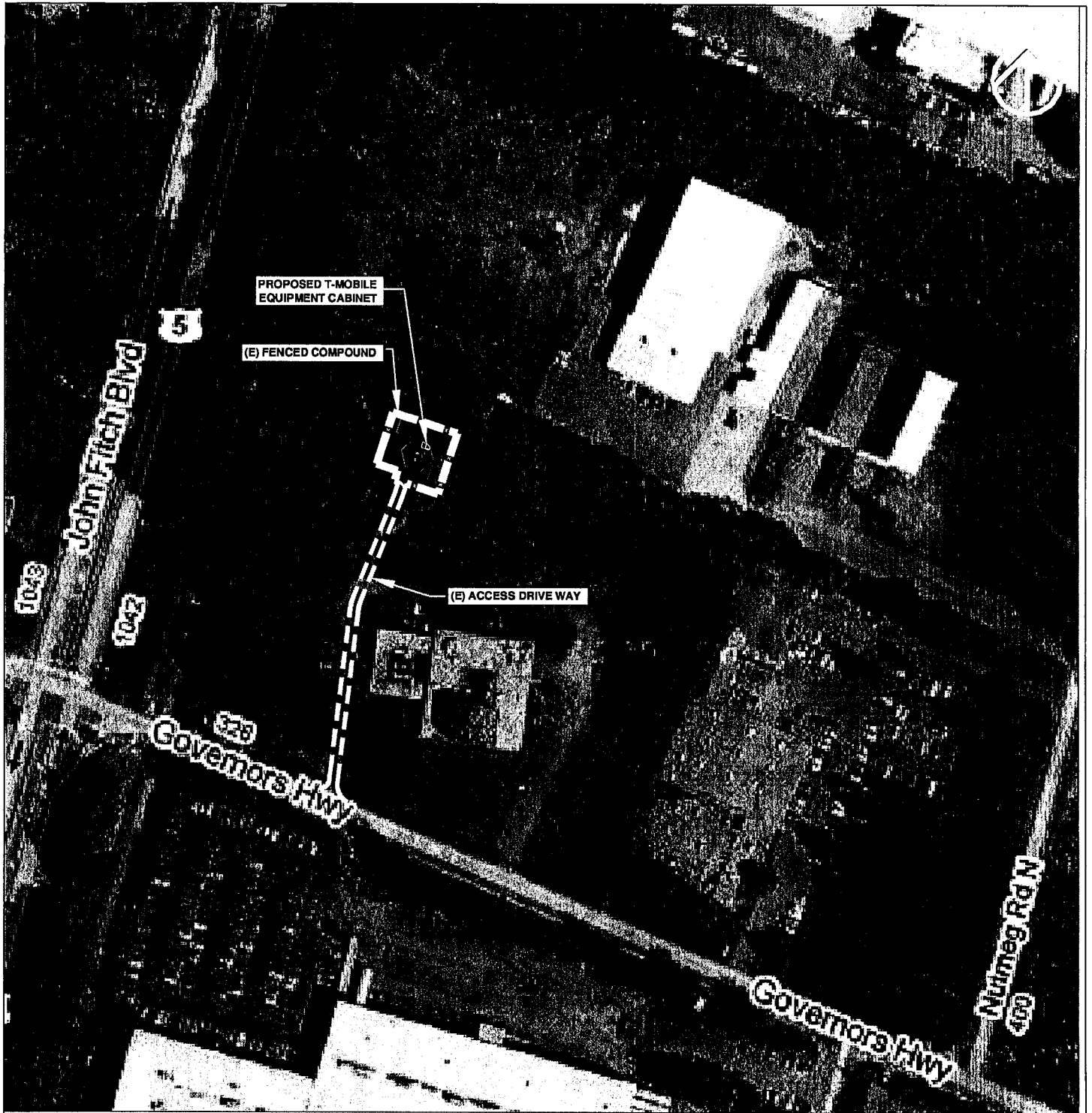
This is to certify that on this 26th day of May, 2009, the foregoing Notice of Exempt

Modification was sent, via first class mail, to the following:

Town of South Windsor
Mayor Cary Prague
Town Hall
1540 Sullivan Avenue
South Windsor, CT 06074

By: 
Thomas J. Regan

40260271 v1 - 025064/0016



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

OVERALL SITE PLAN

N.T.S.

TRANSCEND WIRELESS, LLC

10 INDUSTRIAL AVENUE
MAHWAH, NJ 07430
OFFICE: 201-684-9855
FAX: 201-684-9866

FOR

OMNIPOINT COMMUNICATIONS, INC.

DBA T-MOBILE USA, INC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159



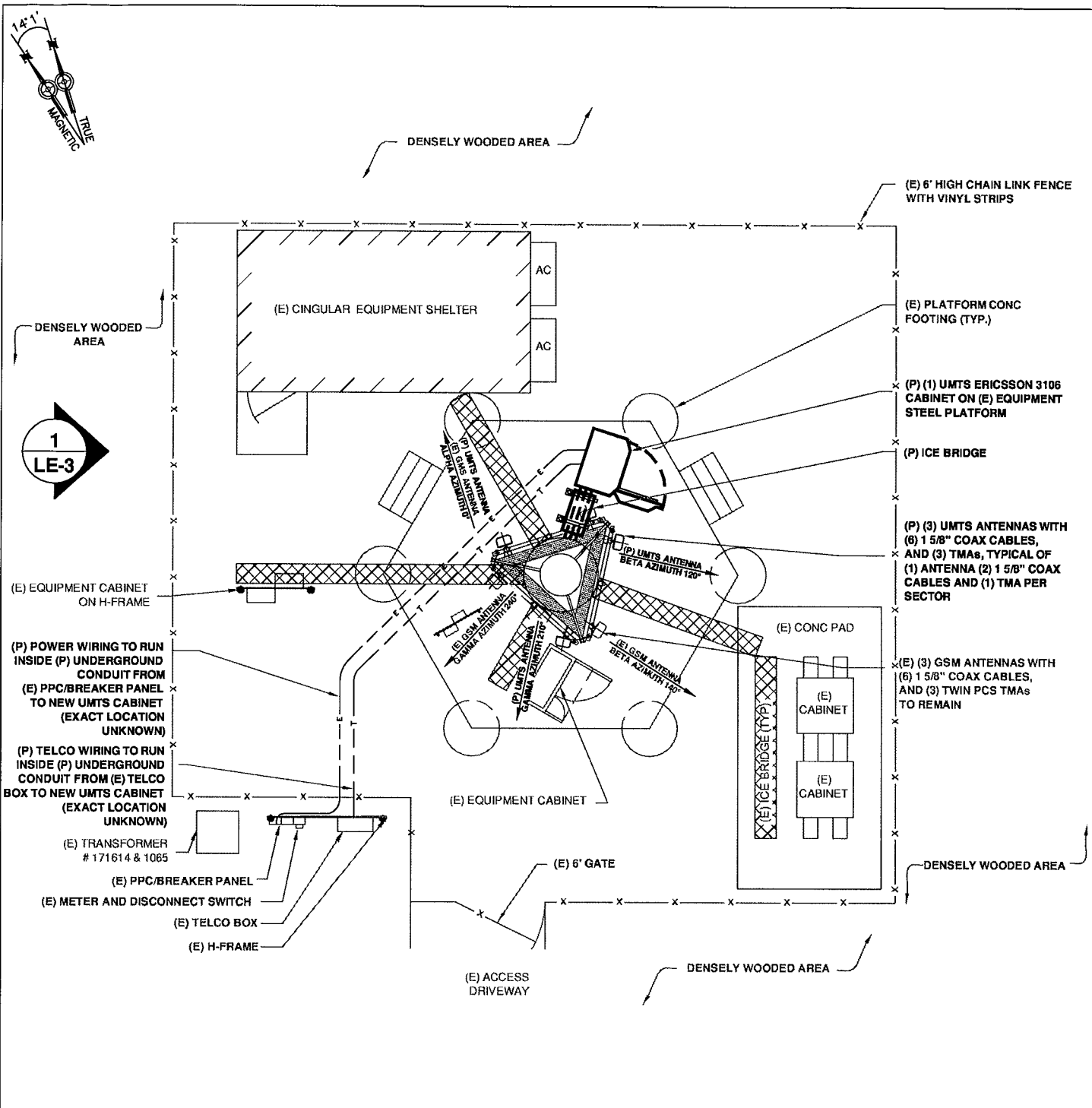
15 Cypress St., Suite 300
Newton Centre, MA 02459
Office: 617-968-0789
Fax: 617-663-6032

SITE NAME: SOUTH WINDSOR/RT 5		
SITE NUMBER: CT11279D		
ADDRESS: 300 GOVERNORS HIGHWAY SOUTH WINDSOR, CT 06074		
0:	FINAL LE	05-22-09
A:	REVIEW	01-30-09
NUMBER	REVISION	DATE
DRAWN BY S.B.	DRAWING NO: LE-1	

APPROVALS

Site Owner	_____	Date	_____
Construction Manager	_____	Date	_____
RF Engineer	_____	Date	_____
Site Acquisition	_____	Date	_____

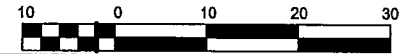
The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

SITE PLAN

SCALE: 1" = 10'-0"



TRANSCEND WIRELESS, LLC
 10 INDUSTRIAL AVENUE
 MAHWAH, NJ 07430
 OFFICE: 201-684-0955
 FAX: 201-684-0966

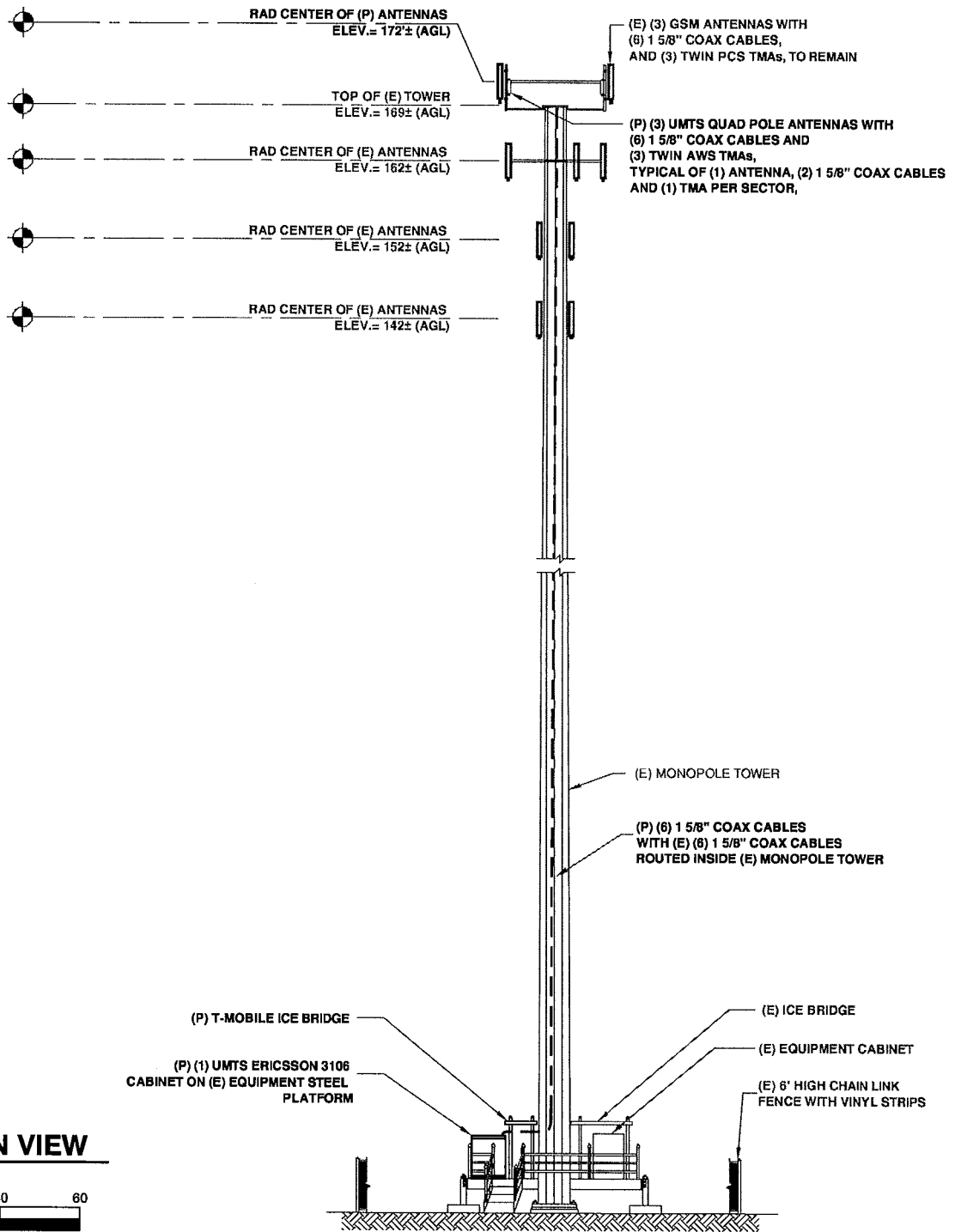
FOR
OMNIPONT COMMUNICATIONS, INC.
 DBA T-MOBILE USA, INC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 692-7100
 FAX: (860) 692-7159

ATLANTIS GROUP
 15 Cypress St., Suite 300
 Newton Centre, MA 02459
 Office: 617-965-0789
 Fax: 617-663-6032

SOUTH WINDSOR/RT 5		
CT11279D		
300 GOVERNORS HIGHWAY SOUTH WINDSOR, CT 06074		
0:	FINAL LE	05-22-09
A:	REVIEW	01-30-09
NUMBER	REVISION	DATE
DRAWN BY	DRAWING NO.	
S.B.	LE-2	

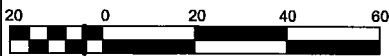
APPROVALS	
Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



WEST ELEVATION VIEW

SCALE: 1" = 20'-0"



TRANSCEND WIRELESS, LLC

10 INDUSTRIAL AVENUE
MAHWAH, NJ 07430
OFFICE: 201-684-8955
FAX: 201-684-9866

FOR

OMNIPOINT COMMUNICATIONS, INC.

DBA T-MOBILE USA, INC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159



15 Cypress St., Suite 300
Newton Centre, MA 02459
Office: 617-965-0789
Fax: 617-663-6032

SITE NAME:
SOUTH WINDSOR/RT 5

SITE NUMBER:
CT11279D

ADDRESS:
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

0:	FINALE	05-22-09
A:	REVIEW	01-30-09
NUMBER	REVISION	DATE

DRAWN BY: S.B. DRAWING NO: **LE-3**

APPROVALS

Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



Structural Analysis of 169 ft Monopole Tower

Site Number: T-Mobile CT11279D

Site Name: Electron Technologies

County: Hartford

Location: 300 Governors Hwy, S. Windsor, CT

Checked By:

A handwritten signature in black ink, appearing to read "Derek Hartzell".

Derek Hartzell
Structural Engineer



ATLANTIS GROUP

15 Cypress Street

Suite 300

Newton Centre, MA 02459

April 2009



May 18, 2009

Hans Fiedler
T-Mobile USA
35 Griffin Road South
Bloomfield, CT 06002

RE: CT11279D – Electron Technologies
300 Governors Hwy, South Windsor, CT

Dear Mr. Fiedler:

We have completed the structural analysis of the subject tower and **have found the tower and foundations to be acceptably loaded within the scope of this analysis to support the proposed antenna loading.** The tower was analyzed according to the requirements of EIA 222-F standard for Hartford County for 80 mph (fastest mile) wind speed with no ice and 69 mph wind with ½” ice.

The tower we analyzed is a 165’ EEI monopole consisting of (4) slip-jointed polygon tubular sections. Pole diameters range from 45.5” at the base to 16.25” at the top. Current foundation reactions were compared to manufacturer’s published reactions.

The antenna loading used in the analysis consisted of all existing antennas and transmission lines with the exception of the following:

- Add (3) APX16DWV-16DWVS-A20 (41 lb wt ea.) (2 ea. 1-5/8” coax) @ 165” for T-Mobile on existing framing.
- Add (3) RFS Twin AWS TMAs (13 lb wt ea.) @ 165’

Proposed feed lines are to be installed inside the pole.

Note that this analysis includes the antenna loading reserved for Verizon Wireless at 110’ which includes their feed lines supported on the outside of the pole.

The StarBase tower foundation frame will support the proposed RBS 3106 Cabinet (1920 lb wt) if the new cabinet is center-located over one of the six tapered beams.

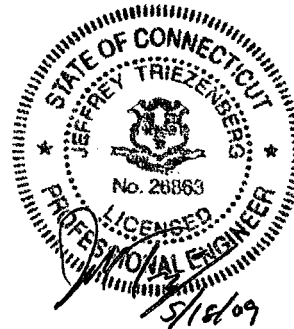
The results of the analysis showed all tower and foundation elements to be loaded within allowable limits.

We appreciate the opportunity to provide our services to T-Mobile and if you have any questions concerning this analysis, please contact us.

Sincerely,

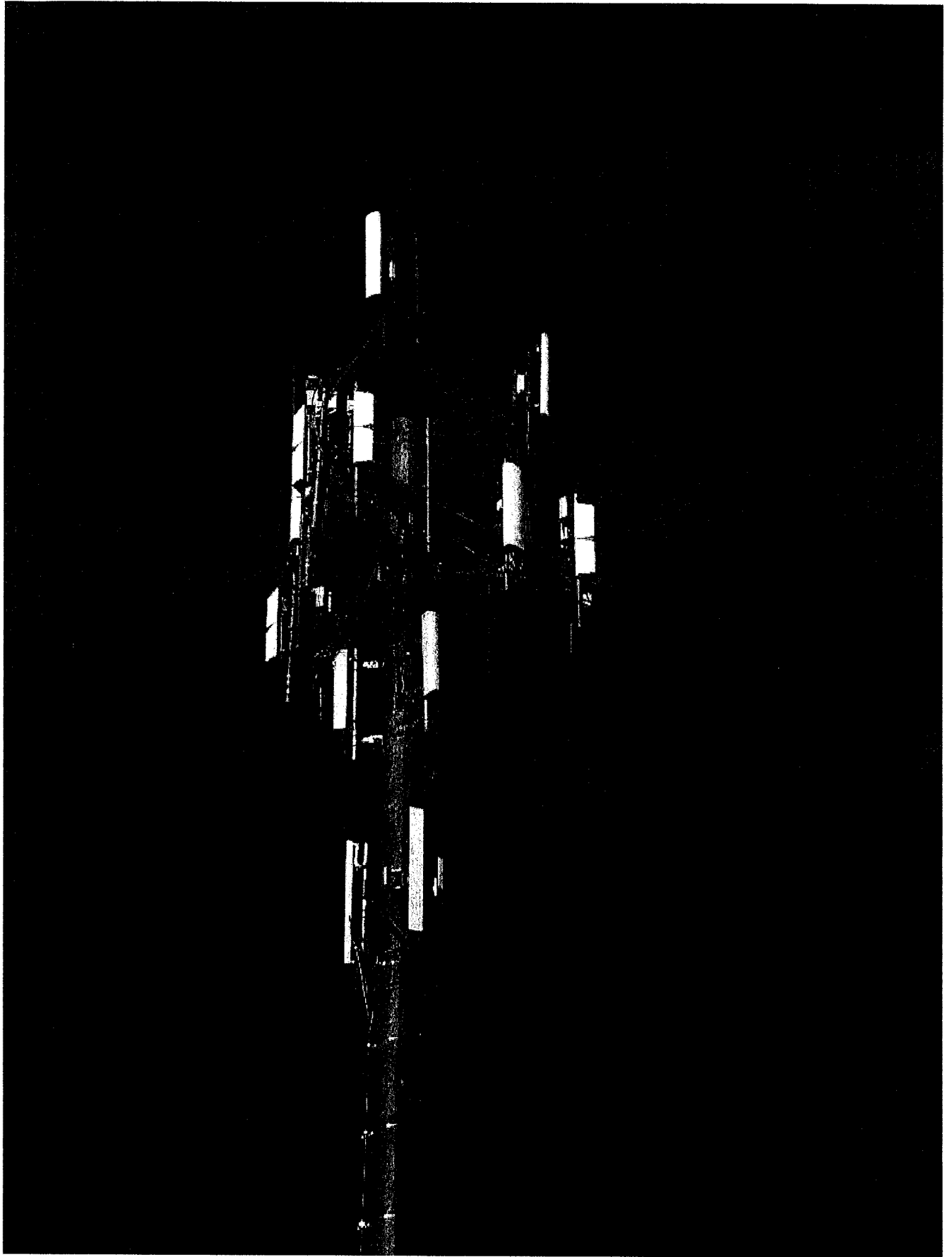
ARMOR TOWER, INC.
Structural Consultant to Atlantis Group

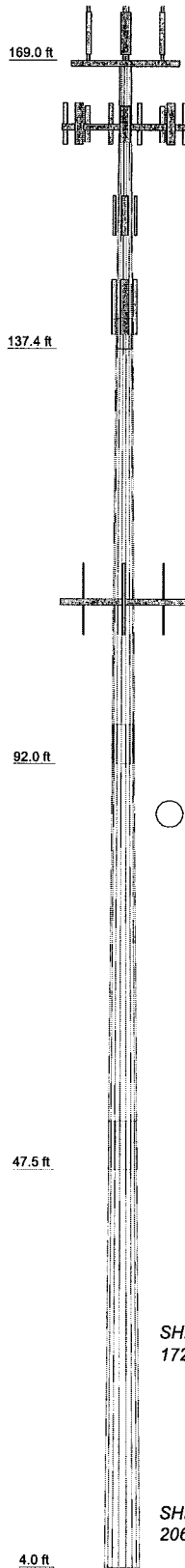
Patrick Botimer
Structural Engineer



PRIMARY ASSUMPTIONS USED IN THE ANALYSIS

1. Allowable steel stresses are defined by AISC-ASD 9th Edition and all welds conform to AWS D1.1 specifications.
2. Armor Tower has been commissioned to analyze this tower according to the requirements of TIA/EIA 222-F for Hartford County, CT. Per this code, a basic wind speed of 80 mph (fastest-mile) without ice and 69 mph with ½" ice has been considered. It is the client's responsibility to check with local authorities or the tower owner if a greater wind or ice loading is required to be considered in the analysis. Note that Section 3108.4 of the International Building Code states that "Towers shall be designed to resist wind loads according to TIA/EIA-222."
3. The acceptability of the analyzed antenna loading is the responsibility of Atlantis Group and its affiliates to confirm with the respective carriers or tower owner.
4. Any deviation from the analyzed antenna loading will require a re-analysis of the tower for verification of structural integrity. Proposed feed lines are to be installed inside the tower.
5. This analysis assumes all tower members galvanized adequately to prevent corrosion of the steel and that all tower members are in "like new" condition with no physical deterioration. This analysis also assumes the tower has been maintained properly per TIA/EIA-222-F Annex E recommended inspection and maintenance procedures for tower owners and is in a plumb condition.
6. No accounting for residual stresses due to incorrect tower erection can be made. This analysis assumes all bolts are appropriately tightened providing necessary connection continuity and that the installation of the tower was performed by a qualified tower erector.
7. This analysis has compared the current reactions with the tower design reactions. It is our assumption that the foundations were properly designed and installed and are able to develop the full tower design reactions. It is also our assumption that the tower base is fully supported by the StarBase frame matching flange.
8. No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original design, materials, fabrication, or potential erection deficiencies. Any information contrary to that assumed for the purpose of preparing this analysis could alter the findings and conclusions as stated.
9. Tower member sizes, geometry, and existing data are based on a Structural analysis by Semaan Engineering Solutions, LLC dated October 2008, Tower Drawings from Engineered Endeavors (GS52237) dated April 2000, and a lease exhibit dated March 2009 all provided by Atlantis Group. Armor Tower has not field-verified this information.
10. The investigation of the load-carrying capacities of the antenna supporting frames/mounts is outside the scope of this analysis.





DESIGNED APPURTENANCE LOADING

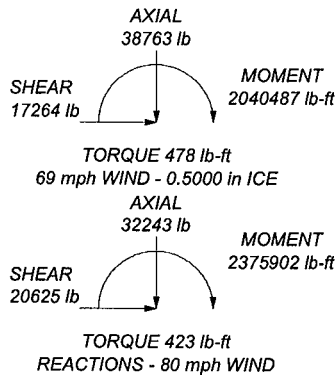
TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	169	(2) Powerwave 7770.00 w. MtgPipe (att)	162
RR90-18-02DP w/Mount Pipe ((E)TM-Alpha)	169	DUO1417-8686 w/Mount Pipe (att)	162
RR90-18-02DP w/Mount Pipe ((E)TM-Beta)	169	DUO1417-8686 w/Mount Pipe (att)	162
RR90-18-02DP w/Mount Pipe ((E)TM-Gamma)	169	(9) TMA	162
RFS APX16DWW-16DWVS-CA20 ((P)TM-Alpha)	169	EEl Band-On 12' Low Profile Platform w/12 pipe	162
RFS APX16DWW-16DWVS-CA20 ((P)TM-Beta)	169	Andrew 932LG65VTE-B w. Pipe (Sprint-Alpha)	152
RFS APX16DWW-16DWVS-CA20 ((P)TM-Gamma)	169	Andrew 932LG65VTE-B w. Pipe (Sprint-Beta)	152
ETW190VS12UB PCS TwinDDTMA ((E)TM-Alpha)	169	Andrew 932LG65VTE-B w. Pipe (Sprint-Gamma)	152
ETW190VS12UB PCS TwinDDTMA ((E)TM-Beta)	169	Kathrein 742 213 w. Mtg Pipe (PocketPCS)	142
ETW190VS12UB PCS TwinDDTMA ((E)TM-Gamma)	169	Kathrein 742 213 w. Mtg Pipe (PocketPCS)	142
RFS ATMAA1412D-1A20 AWS TwinTMA ((P)TM-Alpha)	169	Kathrein 742 213 w. Mtg Pipe (PocketPCS)	142
RFS ATMAA1412D-1A20 AWS TwinTMA ((P)TM-Beta)	169	RWA80013 (VZW-Alpha)	110
RFS ATMAA1412D-1A20 AWS TwinTMA ((P)TM-Gamma)	169	RWA80013 (VZW-Beta)	110
Engineered Endeavors Low-Profile	169	RWA80013 (VZW-Gamma)	110
(2) Powerwave 7770.00 w. MtgPipe (att)	162	BSA-185090/16CF (VZW-Alpha)	110
(2) Powerwave 7770.00 w. MtgPipe (att)	162	BSA-185090/16CF (VZW-Beta)	110
		BSA-185090/16CF (VZW-Gamma)	110
		EEl Band-On 12' Low Profile Platform w/12 pipe	110

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

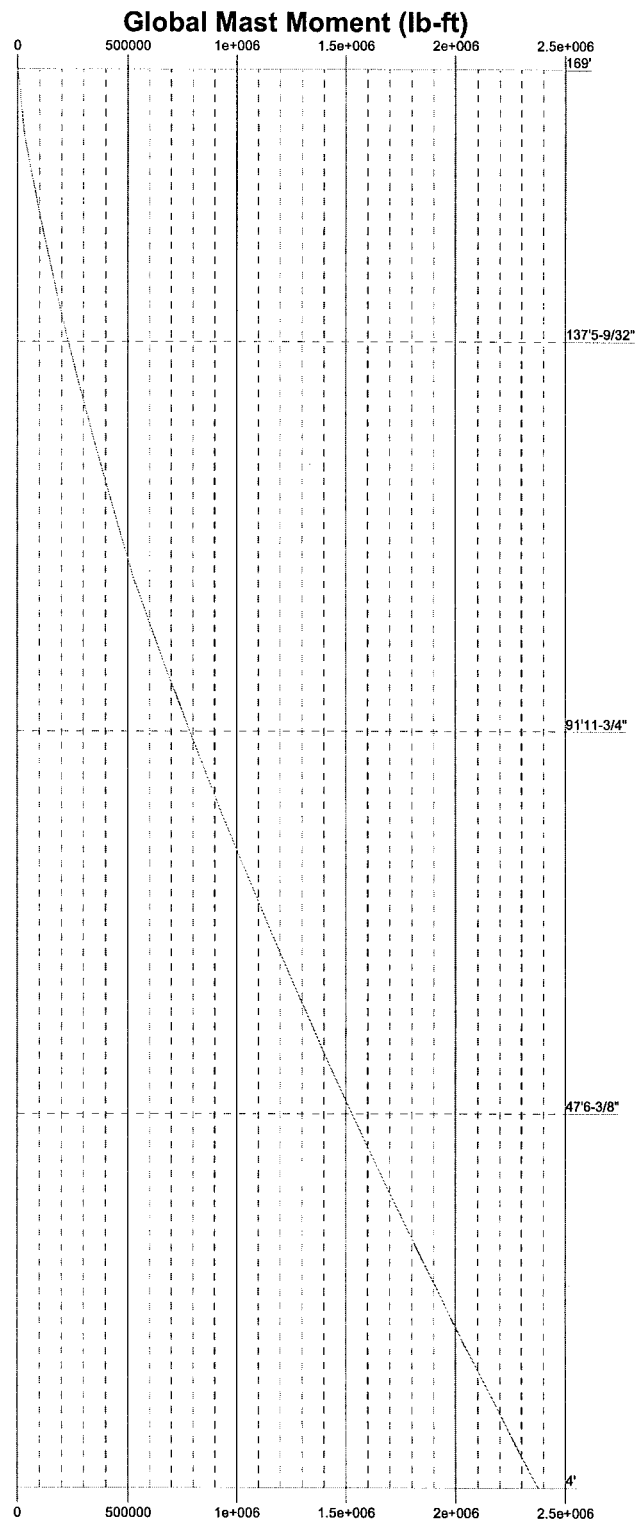
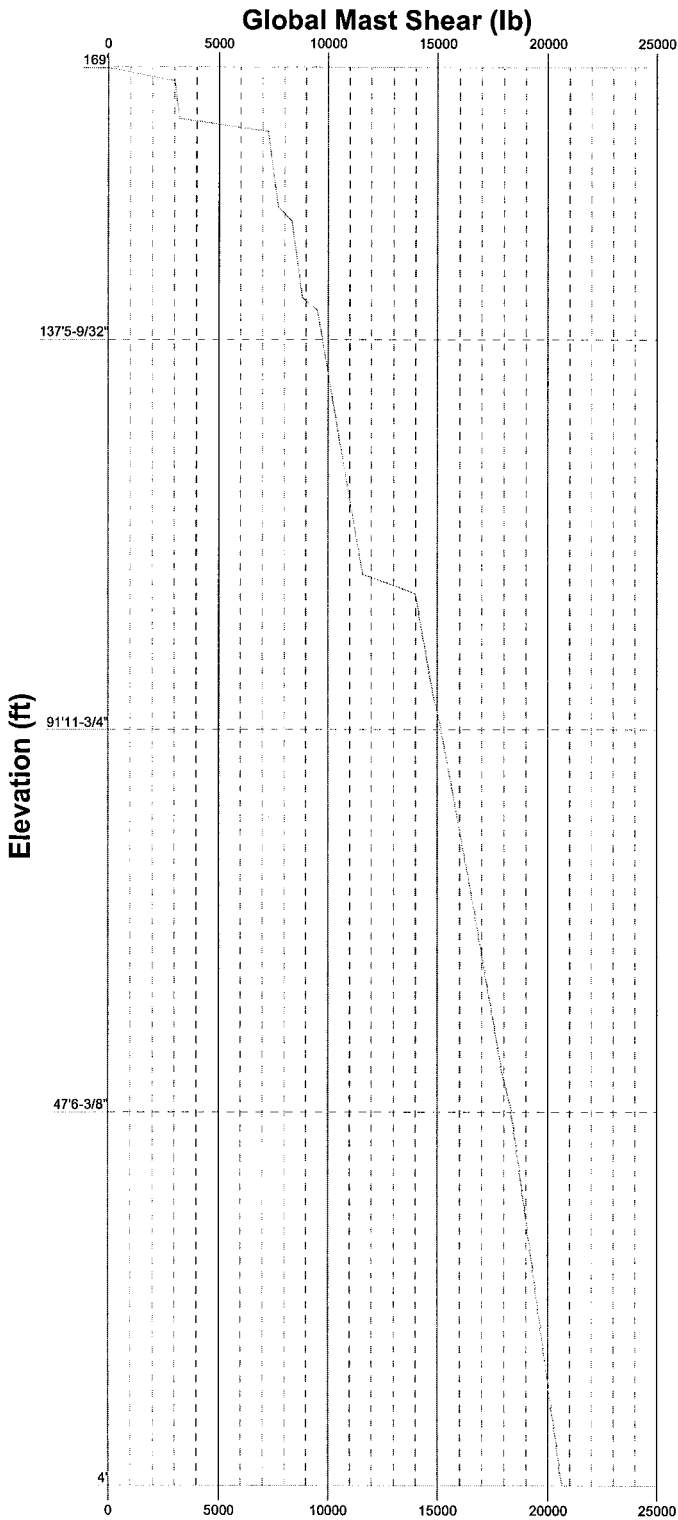
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. (E)xisting, (P)roposed T-Mobile Installation
10. TOWER RATING: 92.9%



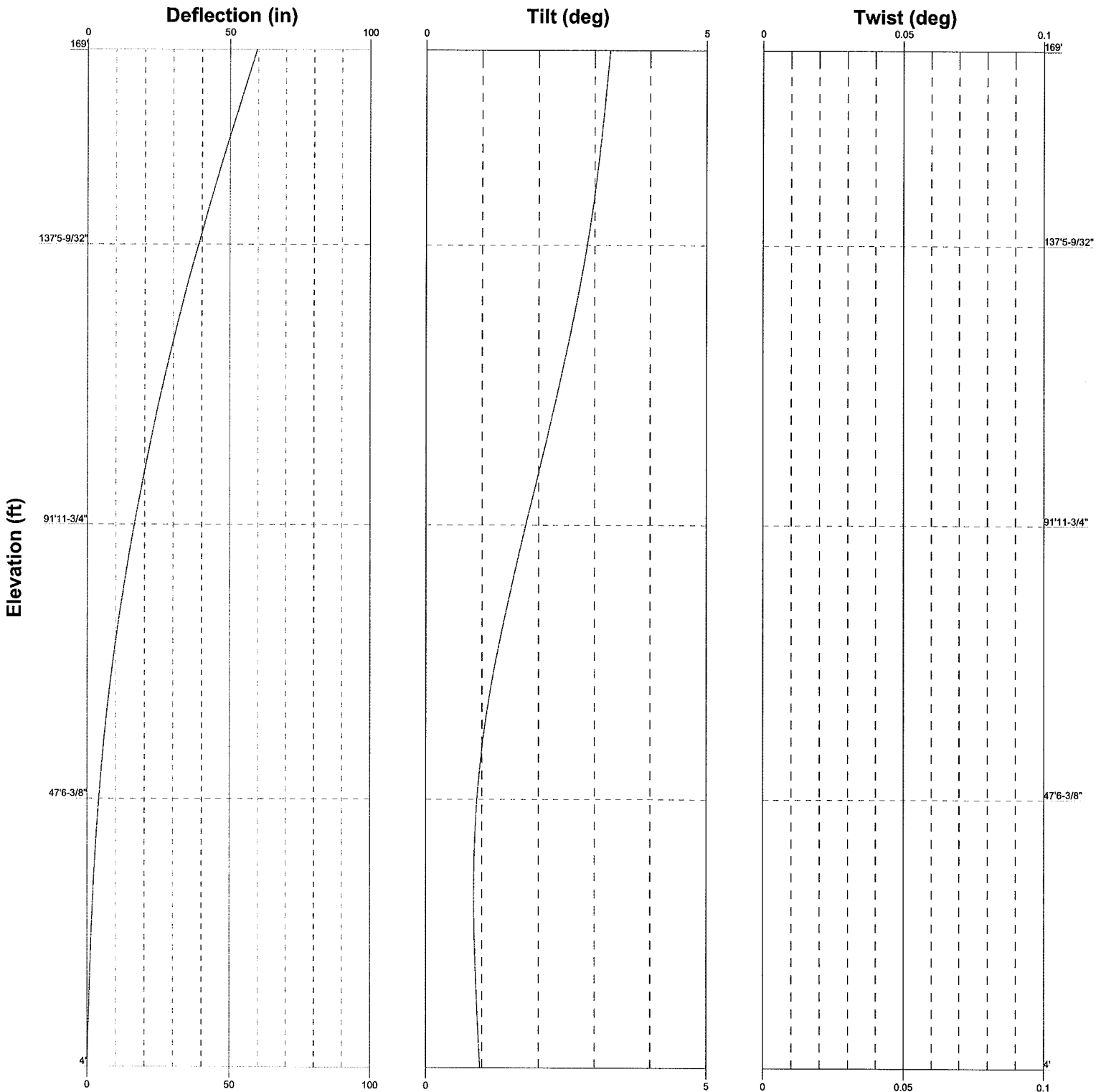
	Armor Tower		Job: 165' EEI MONOPOLE ANALYSIS		
	1 North Main St.		Project: T-Mobile CT11279D Electron Technologies, S.Windsor, CT		
	Cortland, NY 13047		Client: Atlantis Group	Drawn by: Patrick Botlmer	App'd:
	Phone: (607)591-5381		Code: TIA/EIA-222-F	Date: 05/18/09	Scale: NTS
	FAX: (866)870-0840		Path: Z:\Windsor\T-Mobile\CT11279D Electron Technologies\USA Calc\Electron.st		

Vx Vz

Mx Mz



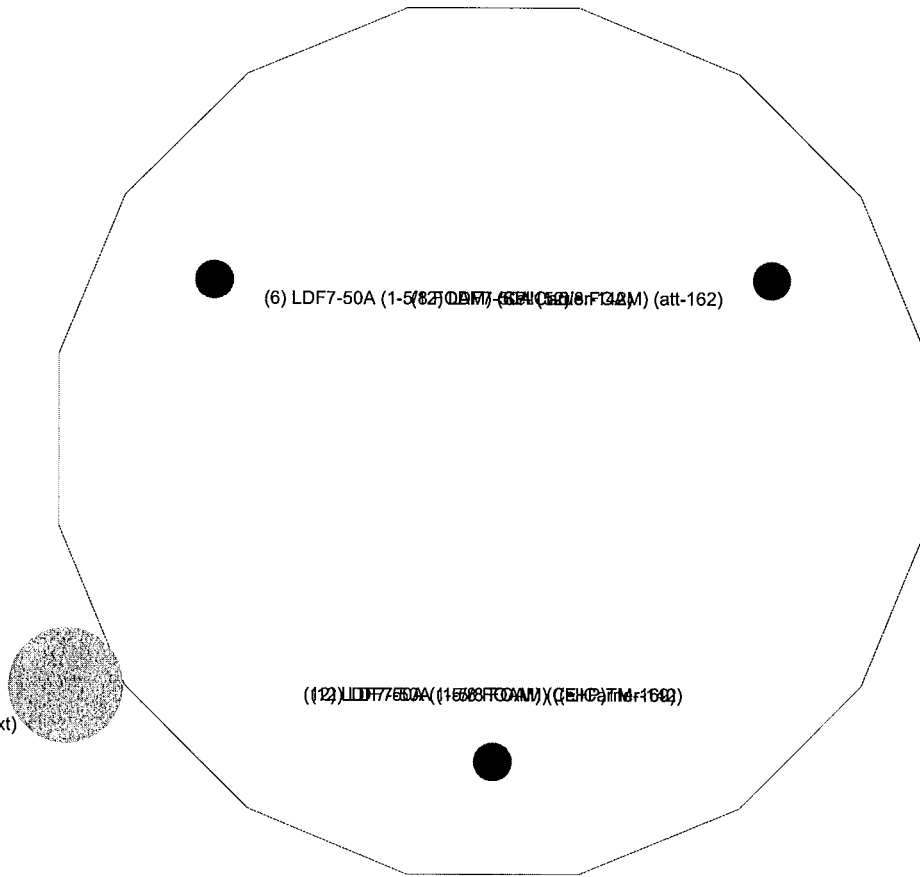
	Armor Tower		Job: 165' EEI MONOPOLE ANALYSIS		
	1 North Main St.		Project: T-Mobile CT11279D Electron Technologies, S.Windsor, CT		
	Cortland, NY 13047		Client: Atlantis Group	Drawn by: Patrick Botimer	App'd:
	Phone: (607)591-5381		Code: TIA/EIA-222-F	Date: 05/18/09	Scale: NTS
	FAX: (866)870-0840		Path:	Dwg No. E-4	



ARMOR TOWER	Armor Tower 1 North Main St. Cortland, NY 13047 Phone: (607)591-5381 FAX: (866)870-0840		Job: 165' EEI MONOPOLE ANALYSIS	
	Project: T-Mobile CT11279D Electron Technologies, S.Windsor, C		Client: Atlantis Group	Drawn by: Patrick Botimer
	Code: TIA/EIA-222-F		Date: 05/18/09	App'd:
	Path: Z:\Atlantis Group\T-Mobile\CT11279D Electron Technologies\RISA Calc\Electron		Scale: NTS	Dwg No. E-5

Feedline Plan

Round _____ Flat _____ App In Face _____ App Out Face _____



LDF7-50A (1-5/8 FOAM) (windload of ext)

ARMOR TOWER	Armor Tower 1 North Main St. Cortland, NY 13047 Phone: (607)591-5381 FAX: (866)870-0840		Job: 165' EEI MONOPOLE ANALYSIS		
	Project: T-Mobile CT11279D Electron Technologies, S.Windsor, C				
	Client: Atlantis Group		Drawn by: Patrick Botimer		App'd:
	Code: TIA/EIA-222-F		Date: 05/18/09		Scale: NTS
	Path: Z:\Projects\General\T-Mobile\CT11279D Electron Technologies\BISA\Calcs\Electron			Dwg No. E-7	



Armor Tower
 1 North Main St.
 Cortland, NY 13047
 Phone: (607)591-5381
 FAX: (866)870-0840


Job	165' EEI MONOPOLE ANALYSIS	Page	1 of 7
Project	T-Mobile CT11279D Electron Technologies, S.Windsor, CT	Date	12:48:08 05/18/09
Client	Atlantis Group	Designed by	Patrick Botimer

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M _x lb-ft	Sum of Overturning Moments, M _z lb-ft	Sum of Torques lb-ft
Leg Weight	20386.75					
Bracing Weight	0.00					
Total Member Self-Weight	20386.75			175.95	246.12	
Total Weight	32243.03			175.95	246.12	
Wind 0 deg - No Ice		0.00	-20624.72	-2244048.51	246.12	-333.36
Wind 30 deg - No Ice		10312.36	-17861.53	-1943379.45	-1121866.11	-151.87
Wind 60 deg - No Ice		17861.53	-10312.36	-1121936.28	-1943309.28	70.32
Wind 90 deg - No Ice		20624.72	0.00	175.95	-2243978.35	273.66
Wind 120 deg - No Ice		17861.53	10312.36	1122288.18	-1943309.28	403.68
Wind 150 deg - No Ice		10312.36	17861.53	1943731.35	-1121866.11	425.53
Wind 180 deg - No Ice		0.00	20624.72	2244400.42	246.12	333.36
Wind 210 deg - No Ice		-10312.36	17861.53	1943731.35	1122358.35	151.87
Wind 240 deg - No Ice		-17861.53	10312.36	1122288.18	1943801.52	-70.32
Wind 270 deg - No Ice		-20624.72	0.00	175.95	2244470.58	-273.66
Wind 300 deg - No Ice		-17861.53	-10312.36	-1121936.28	1943801.52	-403.68
Wind 330 deg - No Ice		-10312.36	-17861.53	-1943379.45	1122358.35	-425.53
Member Ice	3201.69					
Total Weight Ice	38762.96			452.01	700.82	
Wind 0 deg - Ice		0.00	-17263.76	-1887484.82	700.82	-384.49
Wind 30 deg - Ice		8631.88	-14950.86	-1634549.24	-943267.60	-187.03
Wind 60 deg - Ice		14950.86	-8631.88	-943516.40	-1634300.44	60.55
Wind 90 deg - Ice		17263.76	0.00	452.01	-1887236.01	291.90
Wind 120 deg - Ice		14950.86	8631.88	944420.43	-1634300.44	445.04
Wind 150 deg - Ice		8631.88	14950.86	1635453.27	-943267.60	478.93
Wind 180 deg - Ice		0.00	17263.76	1888388.85	700.82	384.49
Wind 210 deg - Ice		-8631.88	14950.86	1635453.27	944669.24	187.03
Wind 240 deg - Ice		-14950.86	8631.88	944420.43	1635702.08	-60.55
Wind 270 deg - Ice		-17263.76	0.00	452.01	1888637.65	-291.90
Wind 300 deg - Ice		-14950.86	-8631.88	-943516.40	1635702.08	-445.04
Wind 330 deg - Ice		-8631.88	-14950.86	-1634549.24	944669.24	-478.93
Total Weight	32243.03			175.95	246.12	
Wind 0 deg - Service		0.00	-8056.53	-876616.33	0.00	-130.22
Wind 30 deg - Service		4028.27	-6977.16	-759167.47	-438325.09	-59.32
Wind 60 deg - Service		6977.16	-4028.27	-438291.24	-759201.33	27.47
Wind 90 deg - Service		8056.53	0.00	33.85	-876650.18	106.90
Wind 120 deg - Service		6977.16	4028.27	438358.95	-759201.33	157.69
Wind 150 deg - Service		4028.27	6977.16	759235.18	-438325.09	166.22
Wind 180 deg - Service		0.00	8056.53	876684.04	0.00	130.22
Wind 210 deg - Service		-4028.27	6977.16	759235.18	438325.09	59.32
Wind 240 deg - Service		-6977.16	4028.27	438358.95	759201.33	-27.47
Wind 270 deg - Service		-8056.53	0.00	33.85	876650.18	-106.90
Wind 300 deg - Service		-6977.16	-4028.27	-438291.24	759201.33	-157.69
Wind 330 deg - Service		-4028.27	-6977.16	-759167.47	438325.09	-166.22

Load Combinations


Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice

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Comb. No.	Description
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	169 - 137.44	Pole	Max Tension	33	0.08	-0.07	0.04
			Max. Compression	14	-8996.36	7.52	-51.73
			Max. Mx	11	-5165.25	199059.50	-31.12
			Max. My	8	-5165.23	6.61	-199092.71
			Max. Vy	11	-9521.08	199059.50	-31.12
			Max. Vx	8	9521.09	6.61	-199092.71
			Max. Torque	11			87.52
L2	137.44 - 91.9818	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17571.78	130.03	-122.47
			Max. Mx	11	-12259.16	719736.09	-63.76
			Max. My	8	-12259.17	53.14	-719751.17
			Max. Vy	11	-14801.51	719736.09	-63.76
			Max. Vx	8	14801.50	53.14	-719751.17
L3	91.9818 - 47.5339	Pole	Max. Torque	19			-148.79
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
L4	47.5339 - 4	Pole	Max. Compression	14	-26529.00	366.43	-258.96	
			Max. Mx	11	-20642.80	1431273.52	-116.07	
			Max. My	8	-20642.82	138.69	-	
								1431252.76
			Max. Vy	11	-17897.46	1431273.52	-116.07	
			Max. Vx	8	17897.44	138.69	-	
								1431252.76
			Max. Torque	26				292.31
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	14	-38762.96	700.82	-452.01	
			Max. Mx	11	-32222.69	2375840.89	-184.29	
			Max. My	8	-32222.69	256.07	-	
								2375769.82
			Max. Vy	11	-20656.49	2375840.89	-184.29	
Max. Vx	8	20656.49	256.07	-				
					2375769.82			
			Max. Torque	26			478.07	

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	24	38762.96	17263.77	0.00
	Max. H _x	11	32243.03	20624.72	-0.00
	Max. H _z	2	32243.03	0.00	20624.72
	Max. M _x	2	2375397.08	0.00	20624.72
	Max. M _z	5	2375326.01	-20624.72	-0.00
	Max. Torsion	26	478.06	8631.88	14950.86
	Min. Vert	1	32243.03	0.00	0.00
	Min. H _x	5	32243.03	-20624.72	-0.00
	Min. H _z	8	32243.03	0.00	-20624.72
	Min. M _x	8	-2375769.82	0.00	-20624.72
	Min. M _z	11	-2375840.89	20624.72	-0.00
	Min. Torsion	20	-478.05	-8631.88	-14950.86

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	32243.03	0.00	0.00	175.95	246.12	0.00
Dead+Wind 0 deg - No Ice	32243.03	-0.00	-20624.72	-2375397.08	255.98	-330.42
Dead+Wind 30 deg - No Ice	32243.03	10312.36	-17861.53	-2057131.36	-1187535.75	-148.82
Dead+Wind 60 deg - No Ice	32243.03	17861.53	-10312.36	-1187607.64	-2057059.81	72.60
Dead+Wind 90 deg - No Ice	32243.03	20624.72	0.00	184.21	-2375326.01	274.63
Dead+Wind 120 deg - No Ice	32243.03	17861.53	10312.36	1187977.14	-2057061.69	403.06
Dead+Wind 150 deg - No Ice	32243.03	10312.36	17861.53	2057503.02	-1187537.62	423.44
Dead+Wind 180 deg - No Ice	32243.03	-0.00	20624.72	2375769.82	255.98	330.42
Dead+Wind 210 deg - No Ice	32243.03	-10312.36	17861.53	2057504.29	1188050.30	148.86
Dead+Wind 240 deg - No Ice	32243.03	-17861.53	10312.36	1187978.41	2057575.84	-72.65
Dead+Wind 270 deg - No Ice	32243.03	-20624.72	0.00	184.21	2375840.89	-274.63
Dead+Wind 300 deg - No Ice	32243.03	-17861.53	-10312.36	-1187608.91	2057573.96	-403.01



Armor Tower
1 North Main St.
Cortland, NY 13047
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Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _y lb-ft	Torque lb-ft
Dead+Wind 330 deg - No Ice	32243.03	-10312.36	-17861.53	-2057132.63	1188048.43	-423.49
Dead+Ice+Temp	38762.96	0.00	0.00	452.01	700.82	0.00
Dead+Wind 0 deg+Ice+Temp	38762.96	-0.00	-17263.77	-2039109.97	745.42	-381.80
Dead+Wind 30 deg+Ice+Temp	38762.96	8631.88	-14950.86	-1765856.88	-1019052.17	-183.23
Dead+Wind 60 deg+Ice+Temp	38762.96	14950.86	-8631.88	-1019313.43	-1765596.12	64.42
Dead+Wind 90 deg+Ice+Temp	38762.96	17263.77	-0.00	484.35	-2038849.89	294.83
Dead+Wind 120 deg+Ice+Temp	38762.96	14950.86	8631.88	1020283.12	-1765597.84	446.23
Dead+Wind 150 deg+Ice+Temp	38762.96	8631.88	14950.86	1766828.56	-1019053.90	478.05
Dead+Wind 180 deg+Ice+Temp	38762.96	-0.00	17263.77	2040082.64	745.42	381.79
Dead+Wind 210 deg+Ice+Temp	38762.96	-8631.88	14950.86	1766829.42	1020545.23	183.24
Dead+Wind 240 deg+Ice+Temp	38762.96	-14950.86	8631.88	1020283.98	1767090.17	-64.44
Dead+Wind 270 deg+Ice+Temp	38762.96	-17263.77	-0.00	484.35	2040342.72	-294.83
Dead+Wind 300 deg+Ice+Temp	38762.96	-14950.86	-8631.88	-1019314.29	1767088.46	-446.22
Dead+Wind 330 deg+Ice+Temp	38762.96	-8631.88	-14950.86	-1765857.74	1020543.52	-478.06
Dead+Wind 0 deg - Service	32243.03	-0.00	-8056.54	-930054.56	258.70	-130.02
Dead+Wind 30 deg - Service	32243.03	4028.27	-6977.16	-805443.36	-464872.45	-58.31
Dead+Wind 60 deg - Service	32243.03	6977.16	-4028.27	-464943.78	-805372.08	28.99
Dead+Wind 90 deg - Service	32243.03	8056.54	0.00	187.39	-929983.36	108.56
Dead+Wind 120 deg - Service	32243.03	6977.16	4028.27	465318.74	-805372.37	159.03
Dead+Wind 150 deg - Service	32243.03	4028.27	6977.16	805818.65	-464872.74	166.87
Dead+Wind 180 deg - Service	32243.03	-0.00	8056.54	930430.01	258.70	130.02
Dead+Wind 210 deg - Service	32243.03	-4028.27	6977.16	805818.84	465390.26	58.33
Dead+Wind 240 deg - Service	32243.03	-6977.16	4028.27	465318.93	805890.12	-29.01
Dead+Wind 270 deg - Service	32243.03	-8056.54	0.00	187.39	930501.21	-108.56
Dead+Wind 300 deg - Service	32243.03	-6977.16	-4028.27	-464943.98	805889.83	-159.02
Dead+Wind 330 deg - Service	32243.03	-4028.27	-6977.16	-805443.56	465389.97	-166.89

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 137.44	59.541	33	3.2796	0.0013
L2	140.773 - 91.9818	40.909	36	2.9194	0.0008
L3	96.3151 - 47.5339	18.195	35	1.8934	0.0005
L4	52.8672 - 4	5.061	35	0.9633	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169'	Flash Beacon Lighting	33	59.541	3.2796	0.0013	14316
162'	(2) Powerwave 7770.00 w. MtgPipe	33	54.774	3.2033	0.0011	10226
152'	Andrew 932LG65VTE-B w. Pipe	36	48.077	3.0842	0.0010	4209
142'	Kathrein 742 213 w. Mtg Pipe	36	41.668	2.9397	0.0008	2685
110'	RWA80013	36	24.205	2.2491	0.0005	2592

Maximum Tower Deflections - Design Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 137.44	151.483	8	8.3494	0.0032
L2	140.773 - 91.9818	104.171	11	7.4354	0.0021
L3	96.3151 - 47.5339	46.391	11	4.8273	0.0013
L4	52.8672 - 4	12.915	11	2.4579	0.0006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169'	Flash Beacon Lighting	8	151.483	8.3494	0.0032	5829
162'	(2) Powerwave 7770.00 w. MtgPipe	8	139.380	8.1587	0.0029	4163
152'	Andrew 932LG65VTE-B w. Pipe	11	122.377	7.8582	0.0024	1711
142'	Kathrein 742 213 w. Mtg Pipe	11	106.097	7.4876	0.0021	1089
110'	RWA80013	11	61.695	5.7063	0.0014	1037

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Bolt Tension lb	Actual Allowable Concrete Stress ksi	Actual Allowable Plate Stress ksi	Actual Allowable Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.5000	12	2.2500	133446.00 131210.58	2.019 2.100	50.939 45.000		Plate	1.13 ✓
			1.02	0.96	1.13			

Compression Checks

Pole Design Data

Section No.	Elevation ft	L ft	L _w ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
L1	169 - 137.44 (1)	31'6-23/32"	0'	0.0	39.000	16.9967	-5165.23	662872.00	0.008
L2	137.44 - 91.9818 (2)	48'9-15/32"	0'	0.0	39.000	28.9938	-12259.10	1130760.00	0.011
L3	91.9818 - 47.5339 (3)	48'9-3/8"	0'	0.0	39.000	43.7180	-20642.80	1705000.00	0.012
L4	47.5339 - 4 (4)	48'10-7/16"	0'	0.0	39.000	53.7100	-32222.70	2094690.00	0.015

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Pole Bending Design Data


Section No.	Elevation ft	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	169 - 137.44 (1)	199092.50	-26.694	39.000	0.684	0.00	0.000	39.000	0.000
L2	137.44 - 91.9818 (2)	719769.17	-41.416	39.000	1.062	0.00	0.000	39.000	0.000
L3	91.9818 - 47.5339 (3)	1431316.67	-43.448	39.000	1.114	0.00	0.000	39.000	0.000
L4	47.5339 - 4 (4)	2375900.00	-47.693	39.000	1.223	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	169 - 137.44 (1)	0.008	0.684	0.000	0.692 ✓	1.333	H1-3 ✓
L2	137.44 - 91.9818 (2)	0.011	1.062	0.000	1.073 ✓	1.333	H1-3 ✓
L3	91.9818 - 47.5339 (3)	0.012	1.114	0.000	1.126 ✓	1.333	H1-3 ✓
L4	47.5339 - 4 (4)	0.015	1.223	0.000	1.238 ✓	1.333	H1-3 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Critical Element	P lb	SF* P_{allow} lb	% Capacity	Pass Fail
L1	169 - 137.44	Pole	1	-5165.23	883608.34	51.9	Pass
L2	137.44 - 91.9818	Pole	2	-12259.10	1507303.02	80.5	Pass
L3	91.9818 - 47.5339	Pole	3	-20642.80	2272764.91	84.5	Pass
L4	47.5339 - 4	Pole	4	-32222.70	2792221.65	92.9	Pass
Summary							
Pole (L4)						92.9	Pass
Base Plate						84.9	Pass
RATING =						92.9	Pass

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Check Foundations

Per EEI drawing, design reactions are:

OTM = 2577 kip-ft

Shear = 20 kip

Axial = 27.6 kip

Current reactions are:

OTM=2376 kip-ft

Shear=20.6 kip

Axial=38.8 kip

Though the axial and shear components are greater than the design components, they do not contribute as significantly to the StarBase foundation frame loading as the overturning moment. Foundations are OK.

Technical Memo

To: Maxton
From: Farid Marbough - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11279D
Date: May 22, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Monopole at 300 Governors Highway, South Windsor, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

- 1) The emissions from T-Mobile transmitters are in the (1935-1944.8), (2140-2145), (2110-2120)MHz frequency Band.
- 2) The antenna array consists of three sectors, with 2 antennas per sector.
- 3) The model number for GSM antenna is RR90-18-02DP.
- 3) The model number for UMTS antenna is APX16DWV-16DWV.
- 4) GSM antenna center line height is 172 ft.
- 4) UMTS antenna center line height is 172 ft.
- 5) The maximum transmit power from any GSM sector is 204.84 Watts Effective Radiated Power (EIRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2209.48 Watts Effective Radiated Power (EIRP) assuming 2 channels per sector.
- 6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
- 7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) The average ground level of the studied area does not change significantly with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Monopole at 300 Governors Highway, South Windsor, CT, is 0.01922 mW/cm². This value represents 1.922% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm²) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area. The combined Power Density from other carriers is 46.75%. The combined Power Density for the site is 48.672% of the M.P.E. standard.

Connecticut Market



Worst Case Power Density

Site: CT11279D
Site Address: 300 Governors Highway
Town: South Windsor
Tower Height: 175 ft.
Tower Style: Monopole

GSM Data		UMTS Data	
Base Station TX output	30 W	Base Station TX output	40 W
Number of channels	8	Number of channels	2
Antenna Model	RR90-18-02DP	Antenna Model	APX16DWV-16DWV
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	1180 ft.	Cable Length	180 ft.
Antenna Height	172.0 ft.	Antenna Height	172.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	17.5 dBi	Antenna Gain	18.0 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	13.6880 dB	Total Cable Loss	2.0880 dB
Total Attenuation	18.1880 dB	Total Attenuation	3.5880 dB
Total EIRP per Channel (In Watts)	44.08 dBm 25.60 W	Total EIRP per Channel (In Watts)	60.43 dBm 1104.74 W
Total EIRP per Sector (In Watts)	53.11 dBm 204.84 W	Total EIRP per Sector (In Watts)	63.44 dBm 2209.48 W
nsg	-0.6880	nsg	14.4120
Power Density (S) = 0.001631 mW/cm ²		Power Density (S) = 0.017591 mW/cm ²	
T-Mobile Worst Case % MPE =		1.9222%	
Equation Used : $S = \frac{(1000)(grf)^2 (Power)^{10^{(nrg/10)}}}{4\pi (R)^2}$			
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Co-Location Total	
Carrier	% of Standard
Verizon	35.1700 %
Cingular	3.1400 %
Sprint	8.4400 %
AT&T Wireless	
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	46.7500 %
T-Mobile	1.9222
Total % MPE for Site	48.6722%