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 2, 2009

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

RE: **EM-T-MOBILE-049-090429 -** Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 4 Oliver Road, Enfield, 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 April 29, 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 Patrick L. Tallarita, Mayor, Town of Enfield
Matthew W. Coppler, Town Manager, Town of Enfield
Jose Giner, Director of Planning and Community Development, Town of Enfield
Crown Castle USA, Inc.

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STATE OF CONNECTICUT

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

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Internet: ct.gov/csc

Daniel F. Caruso
Chairman

May 5, 2009

The Honorable Patrick L. Tallarita
Mayor
Town of Enfield
820 Enfield Street
Enfield, CT 06082

RE: **EM-T-MOBILE-049-090429** - Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 4 Oliver Road, Enfield, Connecticut.

Dear Mayor Tallarita:

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 May 19, 2009.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Jose Giner, Director of Planning and Community Development, Town of Enfield
Matthew W. Coppler, Town Manager, Town of Enfield

BROWNRUDNICK

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

April 30, 2009

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

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 for each of the following:

1. Bristol @ 985 Farmington Avenue;
2. Enfield @ 4 Oliver Road;
3. Cromwell @ 179 Shunpike Road;
4. East Windsor @ 232 South Main Street;
5. Windsor @ 297 Barber Street; and
6. Windsor @ 340 Bloomfield Avenue

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

Also enclosed are six (6) checks in the amount of $500.00 each 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
Thomas J. Regan

TJR/bh
Enclosures
40259330 v1 - REGANTJ - 025064/0016

cc/encls: via 1st Class Mail:

Arthur J. Ward, Mayor
City of Bristol
111 North Main Street
Bristol, CT 06010

Jeremy Shingleton, First Selectman
Town of Cromwell
Town Hall
41 West Street
Cromwell, CT 06416

Denise Menard, First Selectman
Town of East Windsor
Town Hall
11 Rye Street
East Windsor, CT 06016

Scott R. Kaupin, Mayor
Town of Enfield
Town Hall
820 Enfield Street
Enfield, CT 06082

Donald Trinks, Mayor
Town of Windsor
Town Hall
275 Broad Street
PO Box 472
Windsor, CT 06095-0472

CONNECTI EM-T-MOBILE-049-090429

In re:

ORIGINAL

T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility, 4 Oliver Road, Enfield, Connecticut.	:	**EXEMPT MODIFICATION NO. _____**
	:	
	:	April 29, 2009

RECEIVED
APR 29 2009
CONNECTICUT
SITING COUNCIL

NOTICE OF EXEMPT MODIFICATION

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 Enfield of T-Mobile's intent to make an exempt modification to an existing monopole tower (the "Tower") located at 4 Oliver Road in Enfield, 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 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

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

to add UMTS technology, update GSM technology and install associated 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 160-foot monopole tower located at 4 Oliver Road in Enfield, Connecticut (41° 57'36.2", -72° 35'32.3"). The Tower is owned by Crown Media. There are multiple carriers located on the Tower. Currently, T-Mobile has 6 antennas and 6 Tower Mounted Amplifiers ("TMA") located on the Tower with a centerline of 115 feet. A site plan with Tower specifications is attached.

T-Mobile plans to remove and replace 3 of its existing antennas and remove and replace its 6 existing TMA on the Tower. T-Mobile proposes to remove and replace 3 of its existing dual pole antennas with 3 quad pole UMTS antennas. T-Mobile also plans to remove and replace 3 of its TMA with 3 new GMS Twin TMA and plans to remove and replace 3 of its TMA with 3 UMTS Twin TMA. The proposed antennas and TMA will have a centerline of 115 feet. To confirm the Tower can support these changes, T-Mobile commissioned PSG Engineering, Ltd. to perform a structural analysis of the Tower (attached). According to the structural analysis, dated April 9, 2009, "...the tower stress level for the structure and foundation, under the following load case, to be – LC1: Existing + Reserved + Proposed Equipment, Sufficient Capacity" (Page 1, Structural Analysis Report).

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HARTFORD, CT 06103
(860) 509-6500

In addition, T-Mobile proposes to locate 6, 1-5/8 inch coax cables under the proposed ice bridge. T-Mobile plans to relocate 3 of its existing coax cables, which are attached to the 3 existing antennas T-Mobile plans to remove and replace, to the 3 existing antennas that will remain on the Tower. T-Mobile proposes to install the UMTS equipment cabinet on its existing 9-foot by 5-foot (approximately) concrete pad. Hence, no increase in the size of the concrete pad is necessary. T-Mobile plans to install power wiring and telephone wiring to service the proposed equipment at this site.

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 7.59% 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 24.15% 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 remove and replace antennas and TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile

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CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

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

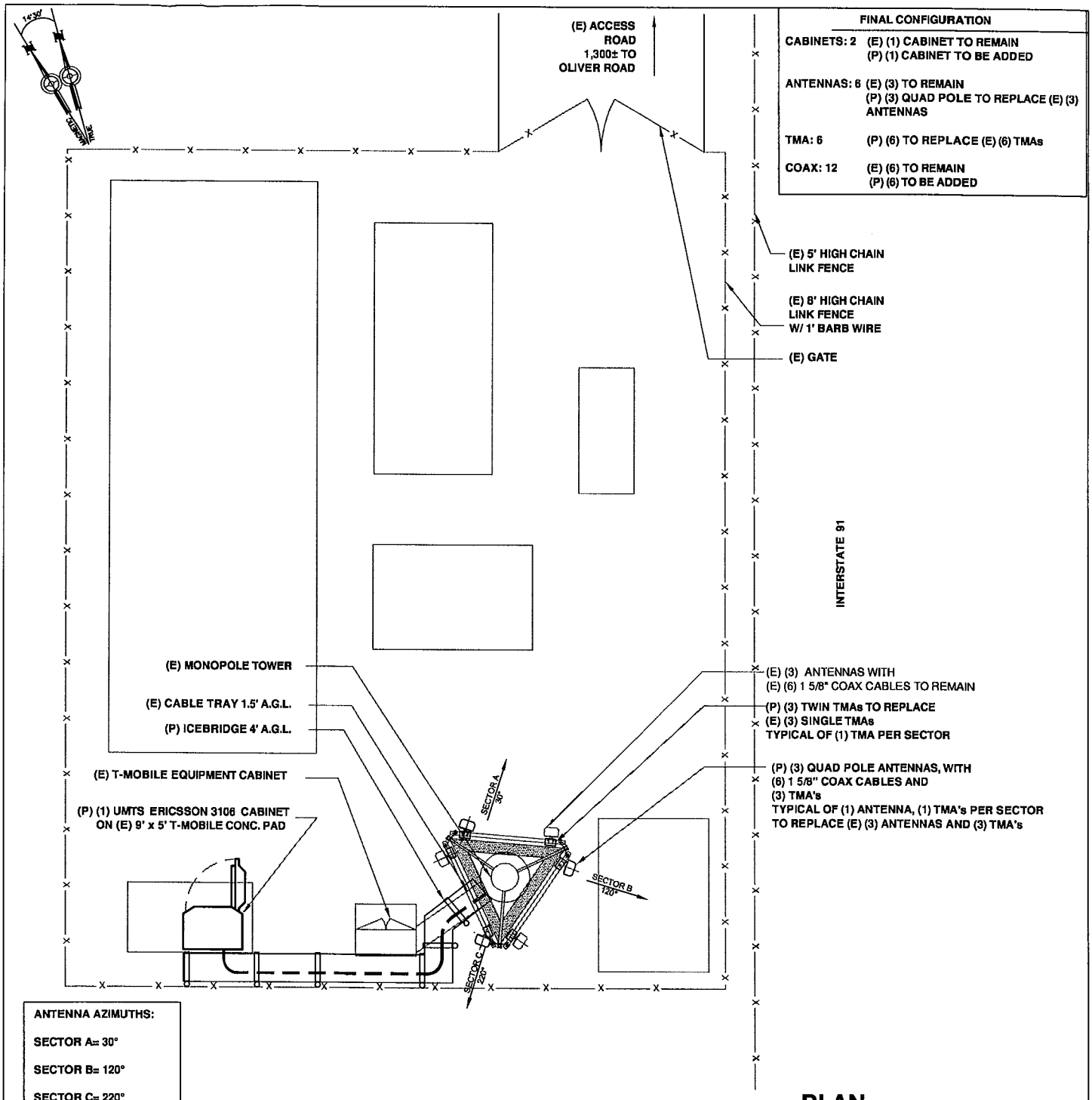
This is to certify that on this 29th day of April, 2009, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

Town of Enfield
Town Hall
Mayor Scott R. Kaupin
820 Enfield Street
Enfield, CT 06082

By: _____
Thomas J. Regan

40259176 v1 - 025064/0016

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500



TRANSCEND WIRELESS
10 INDUSTRIAL AVE.
MAHWAH, NJ 0740
OFFICE: (210) 316-2085
FAX:(210) 684-0066

FOR

OMNIPOINT COMMUNICATIONS, INC. DBA T-MOBILE USA, INC
35 GRIFIN ROAD SOUTH
BLOOMFIEL, 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

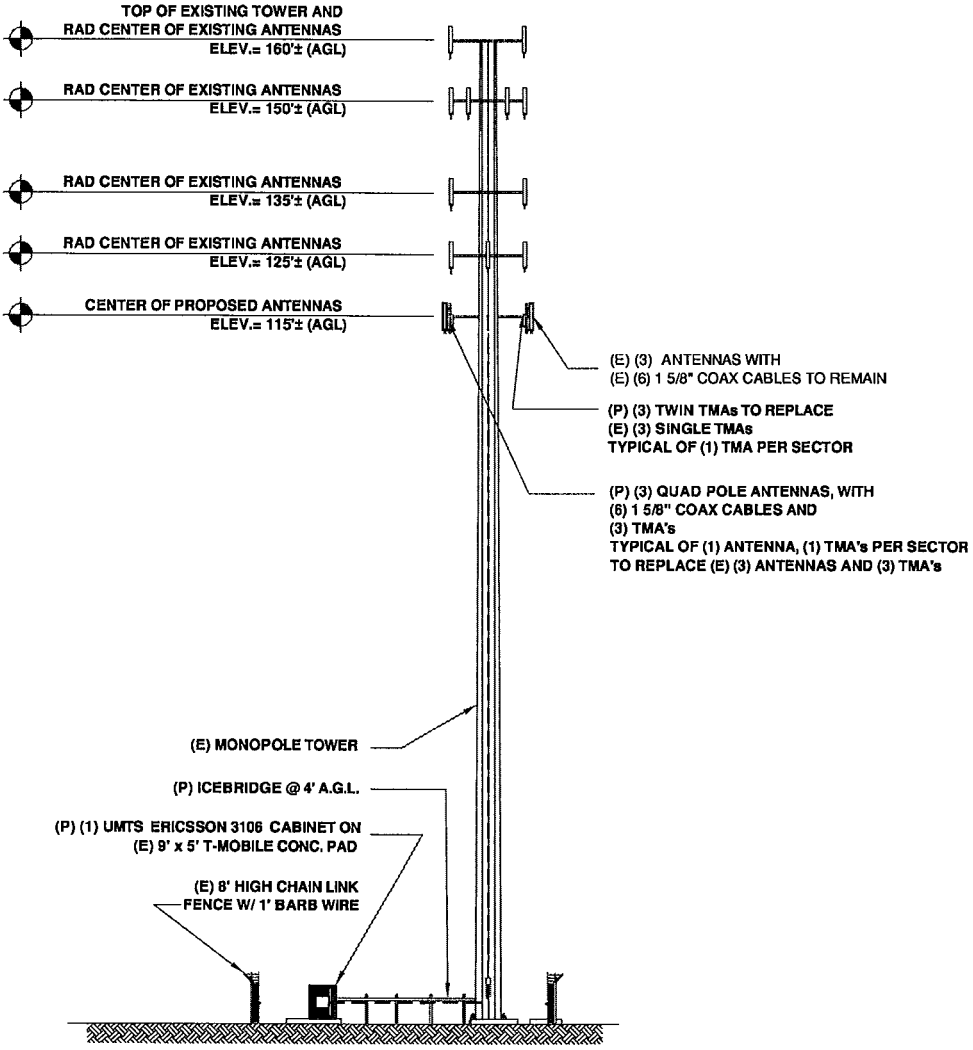
SITE NUMBER:	CT11066A
SITE NAME:	ENFIELD/ OLIVER ROAD 1
ADDRESS:	4 OLIVER ROAD ENFIELD, CT 06082
DRAWN BY	P.I.D.

REVISION	DATE
0: FINAL LE	03-13-09
A: REVIEW	02-04-09

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.



ELEVATION

SCALE: 1" = 30'-0"

15 0 15 30 45

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.

TRANSCEND WIRELESS
10 INDUSTRIAL AVE.
MAHWAH, NJ 0740
OFFICE: (210) 316-2085
FAX:(210) 684-0066

FOR

OMNIPOINT COMMUNICATIONS, INC.
DBA T-MOBILE USA, INC
35 GRIFIN ROAD SOUTH
BLOOMFIEL, 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

SITE NUMBER:	CT11066A
SITE NAME:	ENFIELD/ OLIVER ROAD 1
ADDRESS:	4 OLIVER ROAD ENFIELD, CT 06082
DRAWN BY	P.J.D.

REVISION	DATE
0: FINAL LE	03-13-09
A: REVIEW	02-04-09

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.

Date: **April 9, 2009**

Kevin S. DePatie
Crown Castle USA, Inc.
12725 Morris Road Extension
Suite 400
Alpharetta, GA 30004
(678) 266-1228

PSG Engineering, Ltd.
1006 Thompson Highway
Richmond, TX 77469

Phone: (281) 239-8490
Fax: (281) 239-8515

Subject: **Structural Analysis Report**

Carrier Designation	***T-Mobile* Co-Locate** **Carrier Site Number:** *"CT11066A"* **Carrier Site Name:** *"Enfield/Oliver Rd_1"*
Crown Castle Designation	**Crown Castle BU Number:** *806373* **Crown Castle Site Name:** *HRT 101 943232* **Crown Castle JDE Job Number:** *116639*
Engineering Firm Designation	**PSG Engineering Project Number:** *0901M101-A040152*
Site Data	**Off Oliver St., Enfield, CT, Hartford County** **Latitude *41° 57' 36.2"*, Longitude *-72° 35' 32.3"*** *152* **Foot -** *Monopole* **Tower**

Dear Mr. DePatie,

PSG Engineering, Ltd. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 325227, in accordance with application 75795, revision 4.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading.

The analysis has been performed in accordance with the TIA/EIA 222-F standard based upon a wind speed of 80 mph fastest mile (100 mph 3-second gust).

We at *PSG Engineering, Ltd.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA, Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Oscar Pedraza, P.E.
President

STATE OF CONNECTICUT
OSCAR PEDRAZA
No. 21292
LICENSED PROFESSIONAL ENGINEER

APR 0 9 2009

TABLE OF CONTENTS

1) INTRODUCTION

The tower superstructure analysis is based on the original tower design by Valmont dated November 09, 1991 (TIA/EIA-222-E: 90 mph with 1/2" radial ice). The tower substructure analysis is based on the original foundation design by SAC Engineering, Inc. dated November 16, 1991 and a geotechnical report by FDH Engineering, Inc. dated July 26, 2007.

2) ANALYSIS CRITERIA

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

- Basic wind speed of 80 mph.
- Nominal ice thickness of 0.5000 in.
- Ice density of 56 pcf.
- A wind speed of 69 mph is used in combination with ice.
- Deflections calculated using a wind speed of 50 mph.
- Feedline torque is considered.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.333

Table Legend
Proposed = (P)
Reserved = (R)

Table 1 – Proposed (P) Antenna and Cable Information

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
117	3(P)	RFS/Celwave	APX16DWV-16DWV-S-E-ACU	-	*6(P) (External)	*1 5/8
	6(P)	Andrew	Onebase Twin Dual Duplex			

*Note: Proposed coax lines may be flush mounted to the pole exterior. The coax lines should not be stacked to avoid unnecessary wind loading.

Table 2 – Installed and Reserved (R) Antenna and Cable Information

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
160	6	Powerwave Technologies	7770.00	Single Extension Pipe (1) w/Standoff T-Arm (3)	18 (External)	1 5/8
	6		LGP13519		6 (Internal)	
	6		LGP21401		3 (External)	1/2
152	*****CASE A (Controlling Load Case)***					
	6	Swedcom	ALP 9212-N	Platform w/Handrail (1)	12 (Internal)	1 5/8
	6	Decibel	DB948F85T2E-M		1(R) (Internal)	1/2
	1(R)	Standard	GPS			
	CASE B					
	12(R)	BAM MLA	BAM MLA Antenna	Platform w/Handrail (1)	12(R) (Internal)	1 5/8
137	6+3(R)	Decibel	DB980H90E-M	Platform w/Handrail (1)	6+3(R) (Internal)	1 5/8
127	***CASE A***					
	9+3(R)	Swedcom	ALP 9212-N	Standoff T-Arm (3)	9+3(R) (External)	7/8
	*****CASE B (Controlling Load Case)***					
	9+3(R)	Swedcom	ALP 9212-N	Standoff T-Arm (3)	12(R) (External)	1 1/4
***117	***6	***EMS Wireless	***DR65-18-02DPL2Q	Standoff T-Arm (3)	6 (External)	1 1/4
50	1	Symmetricom	58532A	Single Standoff (1)	1 (Internal)	1/2
40	1	Standard	GPS	Single Standoff (1)	1 (Internal)	1/2

**Note: Controlling Load Case results shown in Table 5 and Appendix A.

***Note: (3) Installed antennas will be removed and replaced with proposed loading. (3) Installed antennas, mounts and coax lines will remain to support proposed loads.

Table 3 – Original Tower Manufacturer Design Antenna and Cable Information

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
147	4	Celwave	PD10017	Low Profile Platform (1)	Not Available	
134	12	Celwave	PD1132	Low Profile Platform (1)		

3) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Original Tower Design	Valmont	822743	Crown Site Data Manager
Original Foundation Design	SAC Engineering, Inc.	821581	
Geotechnical Report	FDH Engineering, Inc.	821582	
CAD Level Drawing(s)	160',150',137',126',116',50',40' Level Drawing(s)	-	Crown CAD Dept.

3.1) Analysis Method

RISATower (Version 5.3.1.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA 222F or the local building code requirements. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with the manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts, and other appurtenances are as specified in Tables 1 and 2 and the Level drawing(s) listed in Table 4.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and PSG Engineering should be allowed to review any new information to determine its effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Capacity – LC1

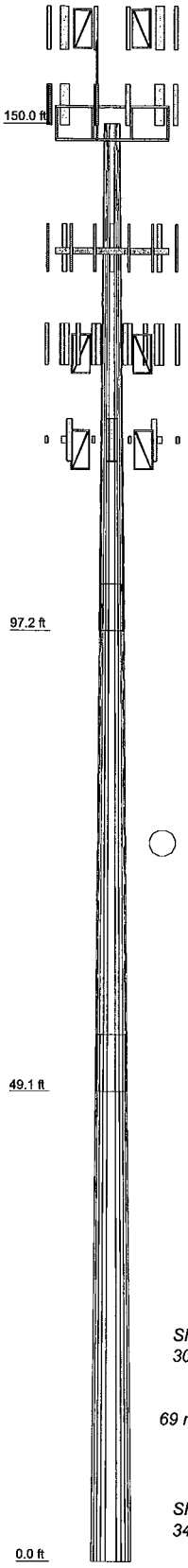
Notes	Component	Elevation (ft)	% Capacity	Pass/Fail
RISA Tower Analysis Summary:(Monopole)				
			Summary	
Notes:	**Component**	**Elevation**	**% Capacity**	**Pass/Fail**
	L1	150 - 97.16	92.5	Pass
1	L2	97.16 - 49.08	96.6	Pass
1	L3	49.08 - 0	99.2	Pass
Individual Components:				
Notes:	**Component**	**Elevation**	**% Capacity**	**Pass/Fail**
	Base Plate	-	82.0	Pass
	Anchor Bolts	-	79.5	Pass
	Base Foundation (Compared w/ Design Loads)	-	99.8	Pass
Structure Rating (max from all components) =				**99.8%**

4.1) Recommendations (if applicable)

No recommendations

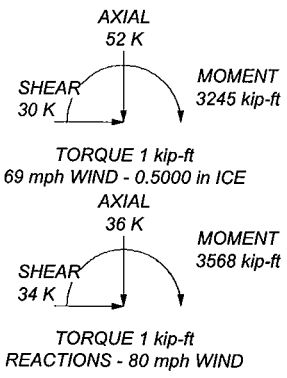
APPENDIX A

RISA TOWER OUTPUT



Section	1	2	3
Length (ft)	52'9-31/32"	52'11-1/32"	55'
Number of Sides	12	12	12
Thickness (in)	0.2500	0.3750	0.4380
Lap Splice (ft)	49-31/32"	5'11-1/32"	
Top Dia (in)	20.3000	29.6392	38.5268
Bot Dia (in)	31.1300	40.4900	49.8000
Grade		A572-65	
Weight (K)	3.7	7.5	11.5

22.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 7770.00 w/Mount Pipe	160	(4) ALP 9212-N w/Mount Pipe	127
(2) LGP21401	160	(4) ALP 9212-N w/Mount Pipe	127
(2) LGP13519	160	5' Standoff T-Arm (10' face width)	126
Pirod 4' Side Mount Standoff (1)	160	5' Standoff T-Arm (10' face width)	126
(2) 7770.00 w/Mount Pipe	160	5' Standoff T-Arm (10' face width)	126
(2) LGP21401	160	DR65-18-02DPL2Q w/Mount Pipe	117
(2) LGP13519	160	APX16DWV-16DWV-S-E-ACU w/Mount Pipe	117
Pirod 4' Side Mount Standoff (1)	160		
(2) 7770.00 w/Mount Pipe	160	(2) ONEBASE TWIN DUAL DUPLEX TMA	117
(2) LGP21401	160		
(2) LGP13519	160	DR65-18-02DPL2Q w/Mount Pipe	117
Pirod 4' Side Mount Standoff (1)	160	APX16DWV-16DWV-S-E-ACU w/Mount Pipe	117
10'6"x4" Pipe Mount	153.5		
(2) ALP 9212-N w/Mount Pipe	152	(2) ONEBASE TWIN DUAL DUPLEX TMA	117
(2) DB948F85T2E-M w/Mount Pipe	152		
(2) ALP 9212-N w/Mount Pipe	152	DR65-18-02DPL2Q w/Mount Pipe	117
(2) DB948F85T2E-M w/Mount Pipe	152	APX16DWV-16DWV-S-E-ACU w/Mount Pipe	117
(2) ALP 9212-N w/Mount Pipe	152	(2) ONEBASE TWIN DUAL DUPLEX TMA	117
(2) DB948F85T2E-M w/Mount Pipe	152		
PiROD 13' Platform w/handrails (Monopole)	150	5' Standoff T-Arm (5' face width)	116
		5' Standoff T-Arm (5' face width)	116
(3) DB980H90E-M w/Mount Pipe	137	5' Standoff T-Arm (5' face width)	116
(3) DB980H90E-M w/Mount Pipe	137	58532A	50
(3) DB980H90E-M w/Mount Pipe	137	Pirod 4' Side Mount Standoff (1)	50
L3 Rail	137	GPS antenna w/ sidearm mount	40
PiROD 13' Low Profile Platform	137		
(4) ALP 9212-N w/Mount Pipe	127		

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. TOWER RATING: 99.2%

PSG Engineering, Ltd.
1006 Thompson Highway
Richmond, TX
Phone: 281.239.8490
FAX: 281.239.8515

Job: *PSG Engineering Project Number: 0901M101-A04015*			
Project: *(806373) (HRT 101 943232)*			
Client: Crown Castle USA, Inc.	Drawn by: JHuwe	App'd:	
Code: TIA/EIA-222-F	Date: 04/10/09	Scale: NTS	
Path: C:\Users\JHuwe\Documents\Work Items\0901M101\806373.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150'-97'2-1/32"	52'9-31/32"	4'9-31/32"	12	20.3000	31.1300	0.2500	1.0000	A572-65 (65 ksi)
L2	97'2-1/32"-49'31/32"	52'11-1/32"	5'11-1/32"	12	29.6392	40.4900	0.3750	1.5000	A572-65 (65 ksi)
L3	49'31/32"-0'	55'		12	38.5268	49.8000	0.4380	1.7520	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.0161	16.1403	828.1804	7.1779	10.5154	78.7588	1678.1181	7.9437	4.7704	19.082
	32.2281	24.8584	3025.6153	11.0550	16.1253	187.6311	6130.7169	12.2345	7.6728	30.691
L2	31.7109	35.3366	3862.6466	10.4766	15.3531	251.5869	7826.7692	17.3916	6.9383	18.502
	41.9183	48.4389	9949.3218	14.3612	20.9738	474.3686	20160.0234	23.8401	9.8463	26.257
L3	41.1414	53.7189	9947.3326	13.6358	19.9569	498.4417	20155.9927	26.4388	9.1513	20.893
	51.5568	69.6182	21651.8084	17.6716	25.7964	839.3345	43872.4339	34.2640	12.1726	27.791

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150'-97'2-1/32"				1	1	1		
L2 97'2-1/32"-49'3				1	1	1		

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
1/32" L3 49'31/32"-0'				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	16
Embedment length	125.0000 in
f'_c	3 ksi
Grout space	3.0000 in
Base plate grade	A572-60
Base plate thickness	2.7500 in
Bolt circle diameter	58.0600 in
Outer diameter	64.0600 in
Inner diameter	24.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*										
*										
*										
*										
*										
*										
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*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
EL. 160' LEVEL								
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	150' - 10'	15	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	150' - 10'	3	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	150' - 10'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF4P-50A (1/2 FOAM)	C	No	CaAa (Out Of Face)	150' - 10'	3	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
*								
*								
EL. 150' LEVEL								
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	150' - 10'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF4P-50A (1/2 FOAM)	B	No	Inside Pole	150' - 10'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
*								
*								
EL. 137' LEVEL								
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	137' - 10'	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
*								
*								
EL. 126' LEVEL								
LDF6-50A (1-1/4 FOAM)	B	No	CaAa (Out Of Face)	126' - 10'	10	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
LDF6-50A (1-1/4 FOAM)	B	No	CaAa (Out Of Face)	126' - 10'	2	No Ice	0.16	0.66
						1/2" Ice	0.25	1.91
*								
*								
EL. 116' LEVEL								
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	116' - 10'	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	116' - 10'	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF6-50A (1-1/4 FOAM)	B	No	CaAa (Out Of Face)	116' - 10'	6	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
*								
*								
EL. 50' LEVEL								
LDF4P-50A (1/2 FOAM)	C	No	Inside Pole	50' - 10'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
*								
*								
EL. 40' LEVEL								
LDF4P-50A (1/2 FOAM)	C	No	Inside Pole	40' - 10'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150'-97'2-1/32"	A	0.000	0.000	0.000	3.729	0.09
		B	0.000	0.000	0.000	8.939	0.83
		C	0.000	0.000	0.000	31.383	1.36
L2	97'2-1/32"-49'31/32"	A	0.000	0.000	0.000	9.521	0.24
		B	0.000	0.000	0.000	14.906	1.05
		C	0.000	0.000	0.000	28.562	1.32
L3	49'31/32"-0'	A	0.000	0.000	0.000	7.739	0.19
		B	0.000	0.000	0.000	12.116	0.85
		C	0.000	0.000	0.000	23.215	1.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	150'-97'2-1/32"	A	0.500	0.000	0.000	0.000	5.612	0.26
		B		0.000	0.000	0.000	14.705	1.41
		C		0.000	0.000	0.000	47.232	2.91
L2	97'2-1/32"-49'31/32"	A	0.500	0.000	0.000	0.000	14.329	0.67
		B		0.000	0.000	0.000	24.522	2.14
		C		0.000	0.000	0.000	42.986	2.73
L3	49'31/32"-0'	A	0.500	0.000	0.000	0.000	11.647	0.55
		B		0.000	0.000	0.000	19.932	1.74
		C		0.000	0.000	0.000	34.940	2.23

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150'-97'2-1/32"	-0.3821	0.3343	-0.4679	0.4392
L2	97'2-1/32"-49'31/32"	-0.2689	0.2777	-0.3113	0.3782
L3	49'31/32"-0'	-0.2324	0.2400	-0.2801	0.3403

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
EL. 160' LEVEL									
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	0.06 0.10
(2) LGP21401	A	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.36 0.48	0.01 0.02
(2) LGP13519	A	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.21 0.28	0.01 0.01
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.67 0' 0'	0.0000	160'	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	0.06 0.10
(2) LGP21401	B	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.36 0.48	0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP13519	B	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.21 0.28	0.01 0.01
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.67 0' 0'	0.0000	160'	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	0.06 0.10
(2) LGP21401	C	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.36 0.48	0.01 0.02
(2) LGP13519	C	From Leg	4.00 0' 0'	0.0000	160'	No Ice 1/2" Ice	0.00 0.00	0.21 0.28	0.01 0.01
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.67 0' 0'	0.0000	160'	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
10'6"x4" Pipe Mount	C	From Leg	1.00 0' 0'	0.0000	153'6"	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
* * ***EL. 150' LEVEL***									
(2) ALP 9212-N w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(2) DB948F85T2E-M w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	0.03 0.07
(2) ALP 9212-N w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(2) DB948F85T2E-M w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	0.03 0.07
(2) ALP 9212-N w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	6.42 7.11	7.45 8.59	0.04 0.10
(2) DB948F85T2E-M w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	152'	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	0.03 0.07
CASE B PiROD 13' Platform w/handrails (Monopole)	C	None		0.0000	150'	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
* * ***EL. 137' LEVEL***									
(3) DB980H90E-M w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	137'	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07
(3) DB980H90E-M w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	137'	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07
(3) DB980H90E-M w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	137'	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
L3 Rail	C	None		0.0000	137'	No Ice	6.50	6.50	0.06
						1/2" Ice	8.70	8.70	0.09
PiROD 13' Low Profile Platform	C	None		0.0000	137'	No Ice	15.70	15.70	1.30
						1/2" Ice	20.10	20.10	1.76
*									
*									
EL. 126' LEVEL									
(4) ALP 9212-N w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	127'	No Ice	6.42	7.45	0.04
						1/2" Ice	7.11	8.59	0.10
5' Standoff T-Arm (10' face width)	A	From Leg	2.67 0' 0'	0.0000	126'	No Ice	5.50	5.50	0.17
						1/2" Ice	6.90	6.90	0.22
(4) ALP 9212-N w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	127'	No Ice	6.42	7.45	0.04
						1/2" Ice	7.11	8.59	0.10
5' Standoff T-Arm (10' face width)	B	From Leg	2.67 0' 0'	0.0000	126'	No Ice	5.50	5.50	0.17
						1/2" Ice	6.90	6.90	0.22
(4) ALP 9212-N w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	127'	No Ice	6.42	7.45	0.04
						1/2" Ice	7.11	8.59	0.10
5' Standoff T-Arm (10' face width)	C	From Leg	2.67 0' 0'	0.0000	126'	No Ice	5.50	5.50	0.17
						1/2" Ice	6.90	6.90	0.22
*									
*									
EL. 116' LEVEL									
DR65-18-02DPL2Q w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice	6.89	4.09	0.05
						1/2" Ice	7.59	5.15	0.10
APX16DWV-16DWV-S-E-A CU w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice	7.07	3.43	0.06
						1/2" Ice	7.64	4.25	0.11
(2) ONEBASE TWIN DUAL DUPLEX TMA	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice	0.67	0.31	0.01
						1/2" Ice	0.79	0.39	0.02
5' Standoff T-Arm (5' face width)	A	From Leg	2.67 0' 0'	0.0000	116'	No Ice	3.50	3.50	0.13
						1/2" Ice	4.20	4.20	0.17
DR65-18-02DPL2Q w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice	6.89	4.09	0.05
						1/2" Ice	7.59	5.15	0.10
APX16DWV-16DWV-S-E-A CU w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice	7.07	3.43	0.06
						1/2" Ice	7.64	4.25	0.11
(2) ONEBASE TWIN DUAL DUPLEX TMA	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice	0.67	0.31	0.01
						1/2" Ice	0.79	0.39	0.02
5' Standoff T-Arm (5' face width)	B	From Leg	2.67 0' 0'	0.0000	116'	No Ice	3.50	3.50	0.13
						1/2" Ice	4.20	4.20	0.17
DR65-18-02DPL2Q w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	117'	No Ice	6.89	4.09	0.05
						1/2" Ice	7.59	5.15	0.10
APX16DWV-16DWV-S-E-A CU w/Mount Pipe	C	From Leg	4.00 0'	0.0000	117'	No Ice	7.07	3.43	0.06
						1/2" Ice	7.64	4.25	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'						
(2) ONEBASE TWIN DUAL DUPLEX TMA	C	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice	0.67 0.79	0.31 0.39	0.01 0.02
5' Standoff T-Arm (5' face width)	C	From Leg	2.67 0' 0'	0.0000	116'	No Ice 1/2" Ice	3.50 4.20	3.50 4.20	0.13 0.17
*									
*									
EL. 50' LEVEL									
58532A	A	From Leg	4.00 0' 0'	0.0000	50'	No Ice 1/2" Ice	0.20 0.36	0.20 0.36	0.00 0.00
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.67 0' 0'	0.0000	50'	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
*									
*									
EL. 40' LEVEL									
GPS antenna w/ sidearm mount	A	From Leg	1.00 0' 0'	0.0000	40'	No Ice 1/2" Ice	2.00 2.50	2.00 2.50	0.05 0.75

Load Combinations

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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 97.1667	46.821	34	2.8440	0.0033
L2	102 - 49.0833	21.330	34	2.0250	0.0011
L3	55 - 0	6.062	34	1.0226	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160'	(2) 7770.00 w/Mount Pipe	34	46.821	2.8440	0.0033	22017
153'6"	10'6"x4" Pipe Mount	34	46.821	2.8440	0.0033	22017
152'	(2) ALP 9212-N w/Mount Pipe	34	46.821	2.8440	0.0033	22017
150'	PiROD 13' Platform w/handrails (Monopole)	34	46.821	2.8440	0.0033	22017
137'	(3) DB980H90E-M w/Mount Pipe	34	39.411	2.6518	0.0026	8467
127'	(4) ALP 9212-N w/Mount Pipe	34	33.862	2.4951	0.0021	4785
126'	5' Standoff T-Arm (10' face width)	34	33.319	2.4787	0.0021	4585
117'	DR65-18-02DPL2Q w/Mount Pipe	34	28.565	2.3237	0.0017	3334
116'	5' Standoff T-Arm (5' face width)	34	28.053	2.3055	0.0016	3236
50'	58532A	34	5.105	0.9671	0.0004	2588
40'	GPS antenna w/ sidearm mount	34	3.527	0.9021	0.0003	3234

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 97.1667	119.258	9	7.2519	0.0083
L2	102 - 49.0833	54.437	9	5.1697	0.0028
L3	55 - 0	15.492	9	2.6135	0.0009

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160'	(2) 7770.00 w/Mount Pipe	9	119.258	7.2519	0.0083	8863
153'6"	10'6"x4" Pipe Mount	9	119.258	7.2519	0.0083	8863
152'	(2) ALP 9212-N w/Mount Pipe	9	119.258	7.2519	0.0083	8863
150'	PiROD 13' Platform w/handrails (Monopole)	9	119.258	7.2519	0.0083	8863
137'	(3) DB980H90E-M w/Mount Pipe	9	100.425	6.7424	0.0066	3407
127'	(4) ALP 9212-N w/Mount Pipe	9	86.319	6.3343	0.0053	1923
126'	5' Standoff T-Arm (10' face width)	9	84.939	6.2921	0.0052	1842
117'	DR65-18-02DPL2Q w/Mount Pipe	9	72.848	5.8990	0.0042	1337
116'	5' Standoff T-Arm (5' face width)	9	71.547	5.8536	0.0041	1298
50'	58532A	9	13.047	2.3990	0.0009	1015
40'	GPS antenna w/ sidearm mount	9	9.016	2.0278	0.0007	1268

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.7500	16	2.2500	140.60	2.223	47.114		Bolt T	1.07
			131.21	2.100	45.000			
			1.07	1.06	1.05			

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 97.1667 (1)	TP31.13x20.3x0.25	52'9-31/32"	0'	0.0	39.000	24.0608	-9.80	938.37	0.010
L2	97.1667 - 49.0833 (2)	TP40.49x29.6392x0.375	52'11-1/32"	0'	0.0	39.000	46.9739	-19.90	1831.98	0.011
L3	49.0833 - 0 (3)	TP49.8x38.5268x0.438	55'	0'	0.0	39.000	69.6182	-36.20	2715.11	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 97.1667 (1)	TP31.13x20.3x0.25	697.24	47.610	39.000	1.221	0.00	0.000	39.000	0.000
L2	97.1667 - 49.0833 (2)	TP40.49x29.6392x0.375	1849.28	49.758	39.000	1.276	0.00	0.000	39.000	0.000
L3	49.0833 - 0 (3)	TP49.8x38.5268x0.438	3568.43	51.018	39.000	1.308	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 97.1667 (1)	TP31.13x20.3x0.25	21.21	0.882	26.000	0.069	0.28	0.009	26.000	0.000
L2	97.1667 - 49.0833 (2)	TP40.49x29.6392x0.375	27.83	0.593	26.000	0.046	0.33	0.004	26.000	0.000
L3	49.0833 - 0 (3)	TP49.8x38.5268x0.438	34.44	0.495	26.000	0.039	0.66	0.004	26.000	0.000

Pole Interaction Design Data

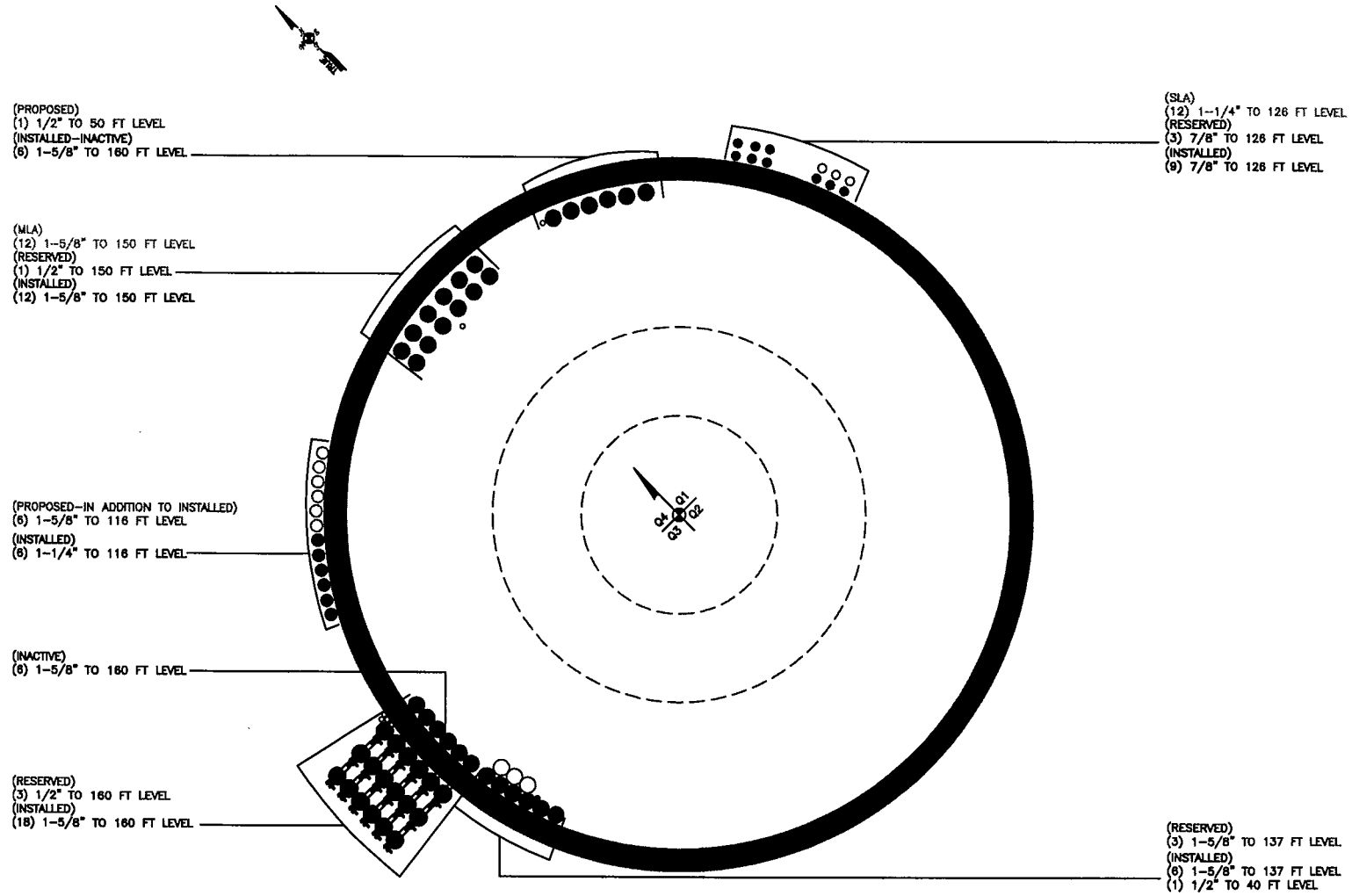
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 97.1667 (1)	0.010	1.221	0.000	0.069	0.000	1.232	1.333	H1-3+VT
L2	97.1667 - 49.0833 (2)	0.011	1.276	0.000	0.046	0.000	1.287	1.333	H1-3+VT
L3	49.0833 - 0 (3)	0.013	1.308	0.000	0.039	0.000	1.322	1.333	H1-3+VT

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 97.1667	Pole	TP31.13x20.3x0.25	1	-9.80	1250.85	92.5	Pass
L2	97.1667 - 49.0833	Pole	TP40.49x29.6392x0.375	2	-19.90	2442.03	96.6	Pass
L3	49.0833 - 0	Pole	TP49.8x38.5268x0.438	3	-36.20	3619.24	99.2	Pass
							Summary	
						Pole (L3)	99.2	Pass
						Base Plate	80.4	Pass
						RATING =	**99.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806373 TOWER ID: C_BASELEVEL

T-Mobile

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Transcend
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11066A
Date: April 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 Self Support Tower at 4 Oliver Rd, Enfield, 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 RR90-17-02DP.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 117 ft.
4) UMTS antenna center line height is 117 ft.
5) The maximum transmit power from any GSM sector is 1768.15 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2491.67 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 Self Support Tower at 4 Oliver Rd, Enfield, CT, is 0.07585 mW/cm^2. This value represents 7.585% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) 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 16.56%. The combined Power Density for the site is 24.145% of the M.P.E. standard.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CT11066A**
Site Address:	**4 Oliver Rd**
Town:	**Enfield**
Tower Height:	**150 ft.**
Tower Style:	**Self Support Tower**

GSM Data		**UMTS Data**	
Base Station TX output	20 W	**Base Station TX output**	40 W
Number of channels	8	**Number of channels**	2
Antenna Model	RR90-17-02DP	**Antenna Model**	APX16DWV-16DWV
Cable Size	1 5/8 in.	**Cable Size**	1 5/8 in.
Cable Length	135 ft.	**Cable Length**	135 ft.
Antenna Height	117.0 ft.	**Antenna Height**	117.0 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	16.5 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0116 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.5660 dB	**Total Cable Loss**	1.5660 dB
Total Attenuation	6.0660 dB	**Total Attenuation**	3.0660 dB
Total EIRP per Channel	53.44 dBm	**Total EIRP per Channel**	60.95 dBm
(In Watts)	221.02 W	**(In Watts)**	1245.83 W
Total EIRP per Sector	62.48 dBm	**Total EIRP per Sector**	63.96 dBm
(In Watts)	1768.15 W	**(In Watts)**	2491.67 W
nsg	10.4340	**nsg**	14.9340
Power Density (S) =	**0.031484 mW/cm^2**	**Power Density (S) =**	**0.044367 mW/cm^2**

T-Mobile Worst Case % MPE = 7.5852%

Equation Used :

$$S = \frac{(1000)(grf)^2(Power)*10^{(nsg/10)}}{4\pi(R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	**% of Standard**
Verizon	5.8600 %
Cingular	2.4000 %
Sprint	2.6600 %
AT&T Wireless	
Nextel	2.0300 %
MetroPCS	
Other Antenna Systems	3.6100 %
Total Excluding T-Mobile	**16.5600 %**
T-Mobile	7.5852
Total % MPE for Site	**24.1452%**