



Daniel F. Caruso
Chairman

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

May 20, 2009

Jennifer Young Gaudet
HPC Development LLC
53 Lake Avenue Ext.
Danbury, CT 06811

RE: **EM-T-MOBILE-051-090416** - Omnipoint Communications Inc. (T-Mobile) notice of intent to modify an existing telecommunications facility located at 100 Reef Road, Fairfield, Connecticut.

Dear Mrs. Gaudet:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The proposed coax lines shall be installed inside the monopole's shaft, or may be installed outside the monopole's shaft in a single row if necessary per the structural analysis report dated March 23, 2009 and sealed by Christopher Michael Murphy, P.E.;
- The Council shall be notified in writing that the coax lines were installed as specified; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the foundation does not exceed 100 percent of its post-construction structural rating

The proposed modifications are to be implemented as specified here and in your notice dated April 15, 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,

A handwritten signature in black ink that reads "S. Derek Phelps". The signature is written in a cursive style with a large initial "S" and a stylized "P".

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Kenneth A. Flatto, First Selectman, Town of Fairfield
Joseph E. Devonshuk, Town Planner, Town of Fairfield
Fairfield Police Department



EM-T-MOBILE-051-090416

ORIGINAL

April 15, 2009

RECEIVED
APR 16 2009

CONNECTICUT
SITING COUNCIL

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

Re: Omnipoint Communications, Inc. – exempt modification
100 Reef Road, Fairfield, Connecticut

Dear Mr. Phelps:

This letter and attachments are submitted on behalf of Omnipoint Communications, Inc. (also referred to herein as “T-Mobile”). T-Mobile is enhancing the capabilities of its wireless system in Connecticut by implementing UMTS technology. In order to do so, T-Mobile will modify antenna and equipment configurations at a number of its existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of Fairfield.

T-Mobile plans to modify the existing facility at the Fairfield Police Department, 100 Reef Road, Fairfield, owned by the Town of Fairfield (coordinates 41°08'23" N, -73°15'28" W). Attached are a roof plan and tower elevation depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to T-Mobile's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Both T-Mobile's existing and proposed antennas will be located at an approximate center line of 133' AGL on the approximately 145' tower. T-Mobile will add three panel antennas and three TMAs, for a total of six; the existing TMAs will be replaced. Six additional coaxial cables will be added. The proposed modifications will not extend the height of the tower.

Mr. S. Derek Phelps
April 15, 2009
Page 2

2. The proposed changes will not extend the site boundaries. T-Mobile will install one additional cabinet on the existing steel frame on the roof of the Police Department building. Thus, there will be no effect on the site boundaries.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.
4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached power density calculation, T-Mobile's operations at the site will result in a power density of 5.3482%; the combined site operations will result in a total power density of 21.9118%.

Please feel free to call me at (860) 798-7454 with questions concerning this matter.
Thank you for your consideration.

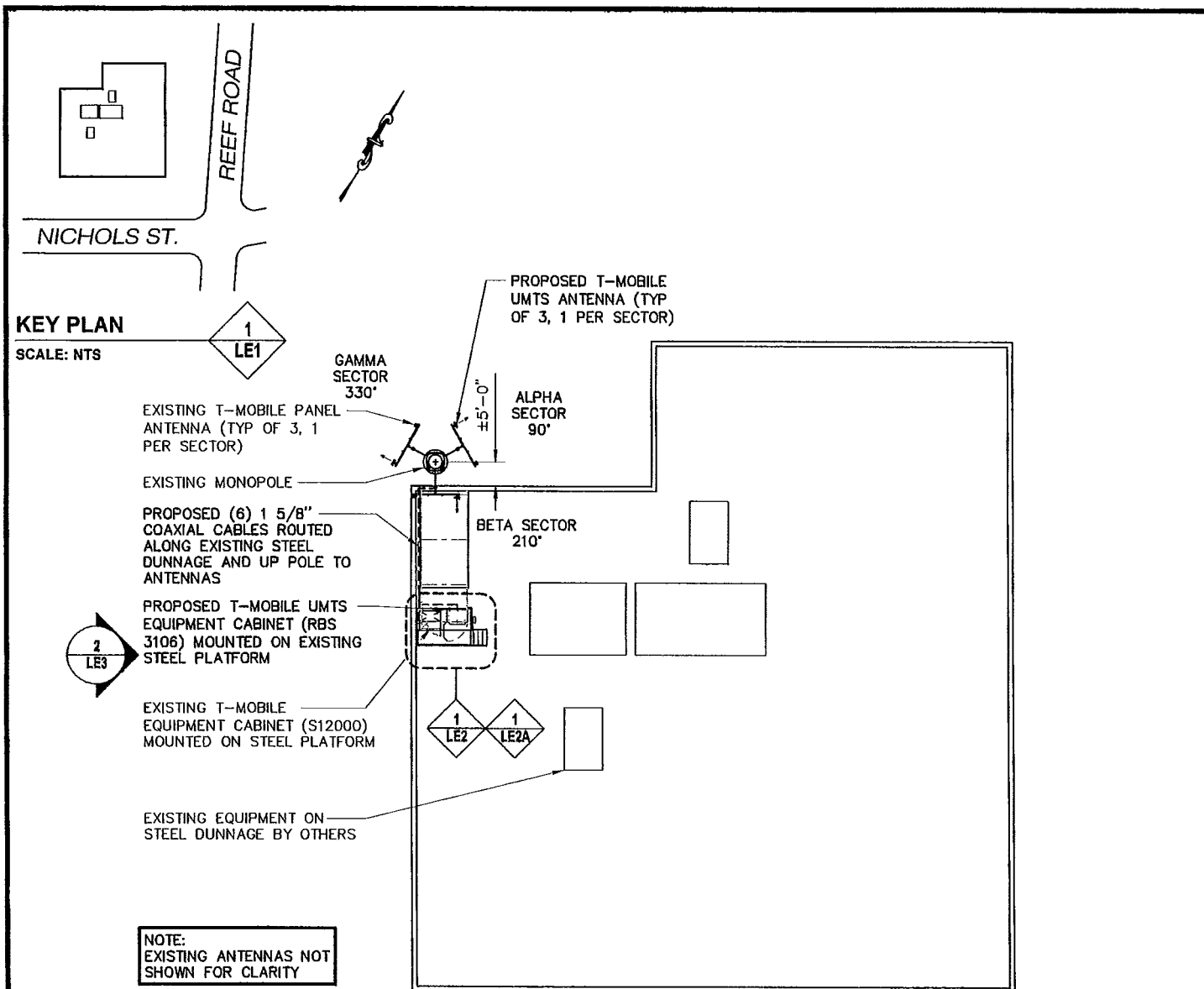
Respectfully yours,



Jennifer Young Gaudet




cc: Honorable Kenneth A. Flatto, First Selectman, Town of Fairfield
(Town of Fairfield is underlying property owner)

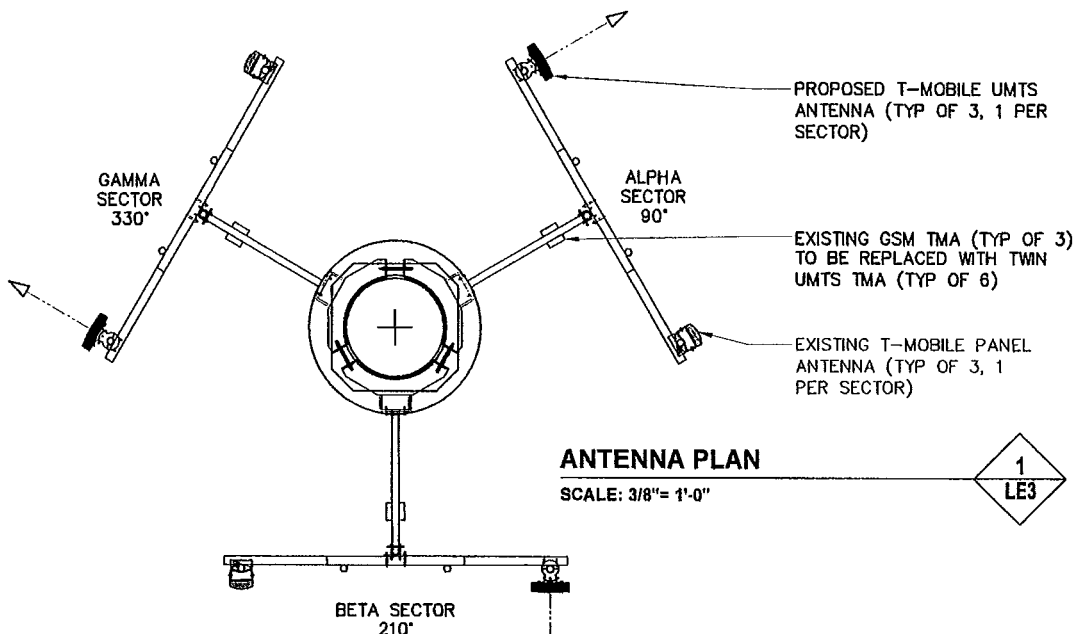
Attachments



ROOF PLAN 2
LE1
SCALE: 1/32" = 1'-0"

- NOTES:
- LEASE EXHIBITS ARE A CONCEPTUAL DESIGN OF LEASE AGREEMENT ONLY. ACTUAL CONSTRUCTION DOCUMENTS MAY VARY TO COMPLY WITH BUILDING CODES.
 - THE INFORMATION SHOWN IS TAKEN FROM A SURVEY PERFORMED BY "KMB DESIGN GROUP, LLC." DURING SITE VISIT.
 - ELECTRIC/ TELCO SERVICES SHALL BE CONFIRMED PRIOR TO CONSTRUCTION DOCUMENT PHASE.
 - 24 HR. 7 DAYS PER WEEK ACCESS IS REQUIRED FOR SERVICE TECHNICIAN.

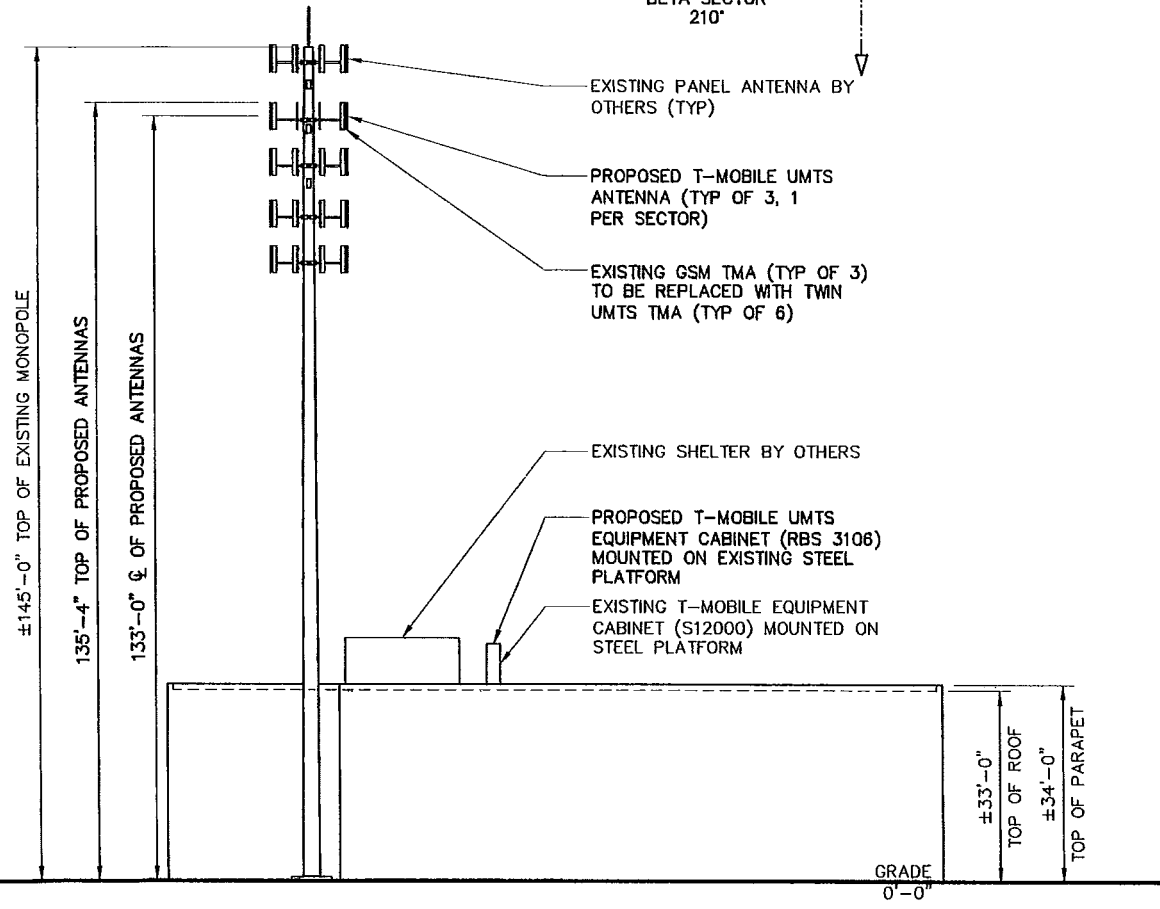
	TITLE:	KEY & ROOF PLAN	PROJECT:	100 REEF ROAD				
	CLIENT:		ADDRESS:	100 REEF ROAD FAIRFIELD, CT 06824 FAIRFIELD COUNTY	3	04-14-09	CCR	
SITE NO:	CT11401A	KMB NO:	350.0004.013	DRAWN BY:	CCR	2	12-02-08	KGD
				CHECKED BY:		1	11-21-08	CCR
						0	11-13-08	CCR
					LE1			



ANTENNA PLAN

SCALE: 3/8" = 1'-0"



1
LE3



SOUTHWEST ELEVATION

SCALE: 1/32" = 1'-0"

2
LE3

	TITLE:	ELEVATION	PROJECT:	100 REEF ROAD												
	CLIENT:		ADDRESS:	100 REEF ROAD FAIRFIELD, CT 06824 FAIRFIELD COUNTY												
SITE NO:	KMB NO:	DRAWN BY:	CHECKED BY:	<table border="1"> <tr> <td>3</td> <td>04-14-08</td> <td>CCR</td> </tr> <tr> <td>2</td> <td>12-02-08</td> <td>KCD</td> </tr> <tr> <td>1</td> <td>11-21-08</td> <td>CCR</td> </tr> <tr> <td>0</td> <td>11-13-08</td> <td>CCR</td> </tr> </table>	3	04-14-08	CCR	2	12-02-08	KCD	1	11-21-08	CCR	0	11-13-08	CCR
3	04-14-08	CCR														
2	12-02-08	KCD														
1	11-21-08	CCR														
0	11-13-08	CCR														
CT11401A	350.0004.013	CCR		LE3												



**Structural Analysis for
KMB Design Group, LLC**

145' Monopole

**Site Name: Reef Road
Site ID: CT11401
Site Address: 100 Reef Rd., Fairfield, CT 06824**

FDH Project Number 09-02131E S1

Prepared By:

James Mathewson III, EI
Project Engineer

Reviewed By:

Christopher M. Murphy, PE
Vice President
CT PE License No. 25842

FDH Engineering, Inc.

2730 Rowland Rd.
Raleigh, NC 27615
(919)-755-1012
info@fdh-inc.com



March 23, 2009

Prepared pursuant to TIA/EIA-222-F June 1996 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

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EXECUTIVE SUMMARY

At the request of KMB Design Group, LLC, FDH Engineering, Inc. performed an analysis of the monopole located in Fairfield, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F*. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Valmont Industries, Inc. (Order No. 11635-94) Record Drawings dated May 19, 1994, All-Points Technology Corporation (Project No. CT255621) Structural Analysis Report dated April 30, 2008 and KMB Design Group, LLC

The *basic design wind speed* per *TIA/EIA-222-F* standards is 85 mph without ice and 74 mph with 1/2" radial ice.

Conclusions

With the existing and proposed antennas from Omnipoint in place at 133 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards. Furthermore, provided the foundation was designed and constructed to support the original design reactions (See Valmont Order No. 11635-94), the foundation should have the necessary capacity support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the monopole's shaft, but may be installed outside the monopole's shaft in a single row if necessary.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from this layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 – Appurtenance Loading

Existing Loading:

No.	Centerline Elevation (ft)	Coax and Lines ¹	Carrier	Mount Type	Description
1-15	143 ²	(10) 7/8" (6) 1-5/8" (2) 1-1/4"	---	(3) 12' T-Arms	(9) Decibel DB844H90E-XY (3) KMW AM-X-WM-17-65 (2) 8' 4-bay Dipoles (1) 18' x 2.5' Omni
16-20	133 ³	(6) 1-1/4" (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (2) 2' x 2' Panels
21-28	125 ²	(6) 1-1/4" (3) 1-5/8" (2) 1/2"	---	(3) 10' T-Arms	(6) Allgon 7770.00 (1) 8' x 1.5" Omni (1) 3' x 2" Omni (6) LGP2140x TMA's
29-34	116	(6) 1-5/8" (6) 1-5/8" ⁴	Metro PCS	(3) 10' T-Arms	(6) Kathrein 800-10504
35-40	108	(6) 1-5/8"	---	(1) Low Profile Platform	(6) Decibel DB980H90E-M

- 1 The existing coax is located inside the pole's shaft, unless otherwise noted.
 2 Omni and dipole elevations are measured from the bottom of the antenna.
 3 The loading for Omnipoint at 133 ft will be altered. See the proposed loading below.
 4 Coax is installed outside the monopole's shaft in a single row.

Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-8	133 ¹	(6) 1-1/4" (6) 1-5/8" ² (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (3) RFS APX16DWV-16DWV-S-E-ACU (2) 2' x 2' Panels

- 1 This represents the final configuration for Omnipoint at 133 ft. According to information provided by KMB, Omnipoint will install (3) RFS APX16DWV-16DWV-S-E-ACU antennas and (6) 1-5/8" coax in addition to the existing loading at 133 ft.
 2 Coax is installed outside the monopole's shaft in a single row.

RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

Table 3 displays the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 – Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	145 - 90.83	Pole	TP33.48x23.61x0.281	55.3	Pass
L2	90.83 - 42.83	Pole	TP41.64x31.976x0.375	75.9	Pass
L3	42.83 - 0	Pole	TP48.69x39.7686x0.4375	84.1	Pass
			Anchor Bolts	OK	Pass
			Base Plate	OK	Pass

Table 4 – Maximum Base Reactions

Load Type	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	37 k	37 k
Shear*	30 k	28 k
Moment	2,881 k-ft	3,277 k-ft

* Based on projects of similar type the foundation has been determined to have adequate capacity to resist the additional shear load.

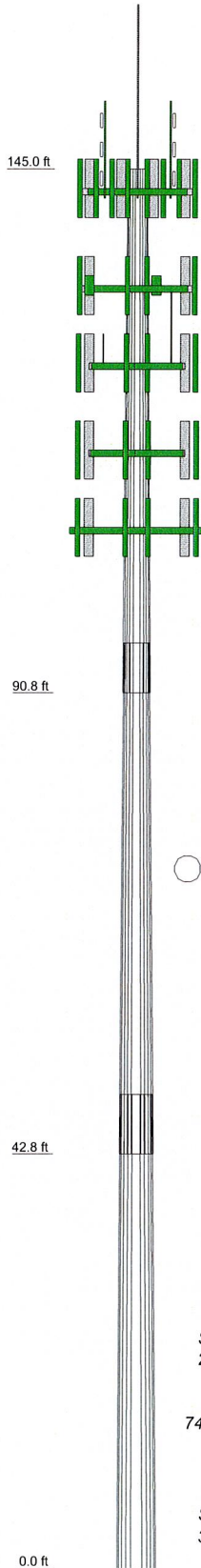
GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of KMB Design Group, LLC to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

Section	1	2	3	
Length (ft)	54.17	53.17	49.00	
Number of Sides	12	12	12	
Thickness (in)	0.2810	0.3750	0.4375	
Lap Splice (ft)			6.17	
Top Dia (in)	23.6100	31.9760	39.7686	
Bot Dia (in)	33.4800	41.6400	48.6900	
Grade		A572-65		
Weight (K)	4.7	8.0	10.3	23.0



DESIGNED APPURTENANCE LOADING

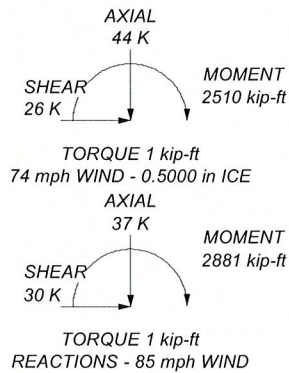
TYPE	ELEVATION	TYPE	ELEVATION
18' x 2.5" omni	152	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	8' x 1.5" omni	129
(3) DB844H90E-XY w/ mount pipe	143	3' x 2" omni	126.5
(3) DB844H90E-XY w/ mount pipe	143	10' T-Arm	125
(3) DB844H90E-XY w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	10' T-Arm	125
12' T-Arms	133	10' T-Arm	125
12' T-Arms	133	10' T-Arm	116
12' T-Arms	133	10' T-Arm	116
RR90-18-00DP w/ mount pipe	133	10' T-Arm	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
RR90-18-00DP w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
RR90-18-00DP w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	13' Low Profile Platform	108
RR90-18-00DP w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108
		(2) DB980H90E-M w/ mount pipe	108

MATERIAL STRENGTH

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

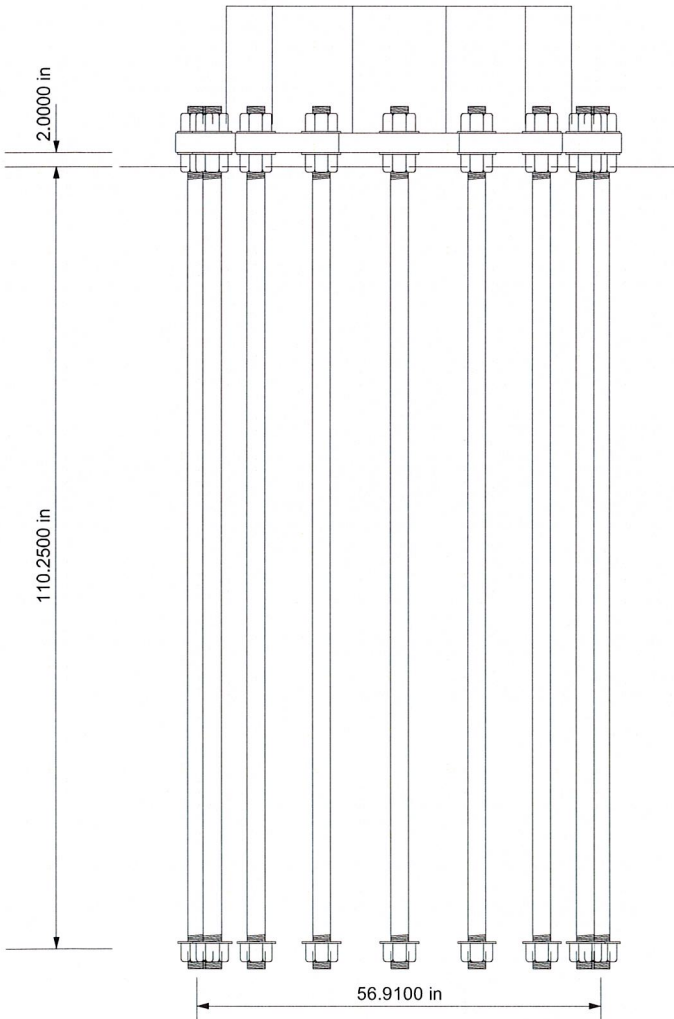
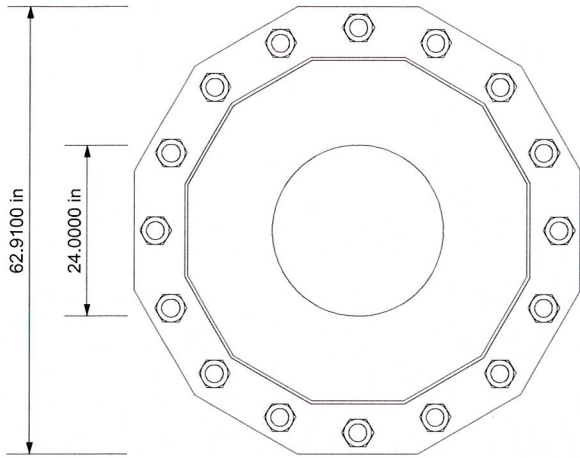
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.




FDH Engineering, Inc.
 2730 Rowland Road
 Raleigh, North Carolina
 Phone: (919) 755-1012
 FAX: (919) 755-1031

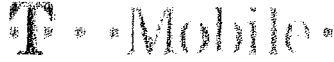
Job: Reef Road, CT11401	Project: 09-02131E S1	Client: KMB Design Group, LLC	Drawn by: James Mathewson III, EIT	App'd:
Code: TIA/EIA-222-F	Date: 03/23/09	Scale: NTS	Dwg No. E-1	



FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A633-60.
3. Anchor bolt grade is A615-75.
4. fc is 4 ksi.

 <p>FDH Engineering, Inc. 2730 Rowland Road Raleigh, North Carolina Tower Analysis Phone: (919) 755-1012 FAX: (919) 755-1031</p>	Job: Reef Road, CT11401		
	Project: 09-02131E S1		
	Client: KMB Design Group, LLC	Drawn by: James Mathewson III, EIT	App'd:
	Code: TIA/EIA-222-F	Date: 03/23/09	Scale: NTS
Path:	<small>\\fs-servers\Projects\2009\Projects\2 - Faber\02201116\Reef Road - CT Analysis\Reef Road - CT11401.dwg</small>		Dwg No. F-1



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

Technical Memo

From: Farid Marbough - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11401A
Date: April 10, 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 100 Reef Road, Fairfield, 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 (1940-1949.8), (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 133 ft.
- 4) UMTS antenna center line height is 133 ft.
- 5) The maximum transmit power from any GSM sector is 1632 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2299.8 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 100 Reef Road, Fairfield, CT, is 0.05348 mW/cm². This value represents 5.348% 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 16.5636%. The combined Power Density for the site is 21.912% of the M.P.E. standard.

Connecticut Market



Worst Case Power Density

Site: CT11401A
Site Address: 100 Reef Road
Town: Fairfield
Tower Height: 145 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	APX16DWW-16DWW
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	165 ft.	Cable Length	165 ft.
Antenna Height	133.0 ft.	Antenna Height	133.0 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	1.9140 dB	Total Cable Loss	1.9140 dB
Total Attenuation	6.4140 dB	Total Attenuation	3.4140 dB
Total EIRP per Channel (In Watts)	53.10 dBm 204.00 W	Total EIRP per Channel (In Watts)	60.61 dBm 1149.90 W
Total EIRP per Sector (In Watts)	62.13 dBm 1632.00 W	Total EIRP per Sector (In Watts)	63.62 dBm 2299.80 W
nsg	10.0860	nsg	14.5860
Power Density (S) = 0.022199 mW/cm ²		Power Density (S) = 0.031283 mW/cm ²	
T-Mobile Worst Case % MPE =		5.3482%	
Equation Used : $S = \frac{(1000(\text{grf})^2 (\text{Power})^{(nsg/10)})}{4\pi (R)^2}$			
Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997			

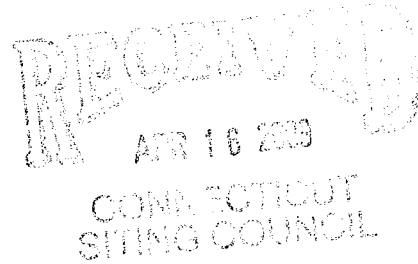
Carrier	% of Standard
Verizon	
Cingular	
Sprint	0.0095 %
AT&T Wireless	0.0058 %
Nextel	0.0070 %
MetroPCS	16.5200 %
Other Antenna Systems	0.0213 %
Total Excluding T-Mobile	16.5636 %
T-Mobile	5.3482
Total % MPE for Site	21.9118%



HPC DEVELOPMENT
LLC

EM-T-MOBILE-051-090416

April 15, 2009



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

Re: Omnipoint Communications, Inc. – exempt modification
100 Reef Road, Fairfield, Connecticut

Dear Mr. Phelps:

This letter and attachments are submitted on behalf of Omnipoint Communications, Inc. (also referred to herein as “T-Mobile”). T-Mobile is enhancing the capabilities of its wireless system in Connecticut by implementing UMTS technology. In order to do so, T-Mobile will modify antenna and equipment configurations at a number of its existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of Fairfield.

T-Mobile plans to modify the existing facility at the Fairfield Police Department, 100 Reef Road, Fairfield, owned by the Town of Fairfield (coordinates 41°08'23" N, -73°15'28" W). Attached are a roof plan and tower elevation depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to T-Mobile's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Both T-Mobile's existing and proposed antennas will be located at an approximate center line of 133' AGL on the approximately 145' tower. T-Mobile will add three panel antennas and three TMAs, for a total of six; the existing TMAs will be replaced. Six additional coaxial cables will be added. The proposed modifications will not extend the height of the tower.

Mr. S. Derek Phelps
April 15, 2009
Page 2

2. The proposed changes will not extend the site boundaries. T-Mobile will install one additional cabinet on the existing steel frame on the roof of the Police Department building. Thus, there will be no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached power density calculation, T-Mobile's operations at the site will result in a power density of 5.3482%; the combined site operations will result in a total power density of 21.9118%.

Please feel free to call me at (860) 798-7454 with questions concerning this matter.
Thank you for your consideration.

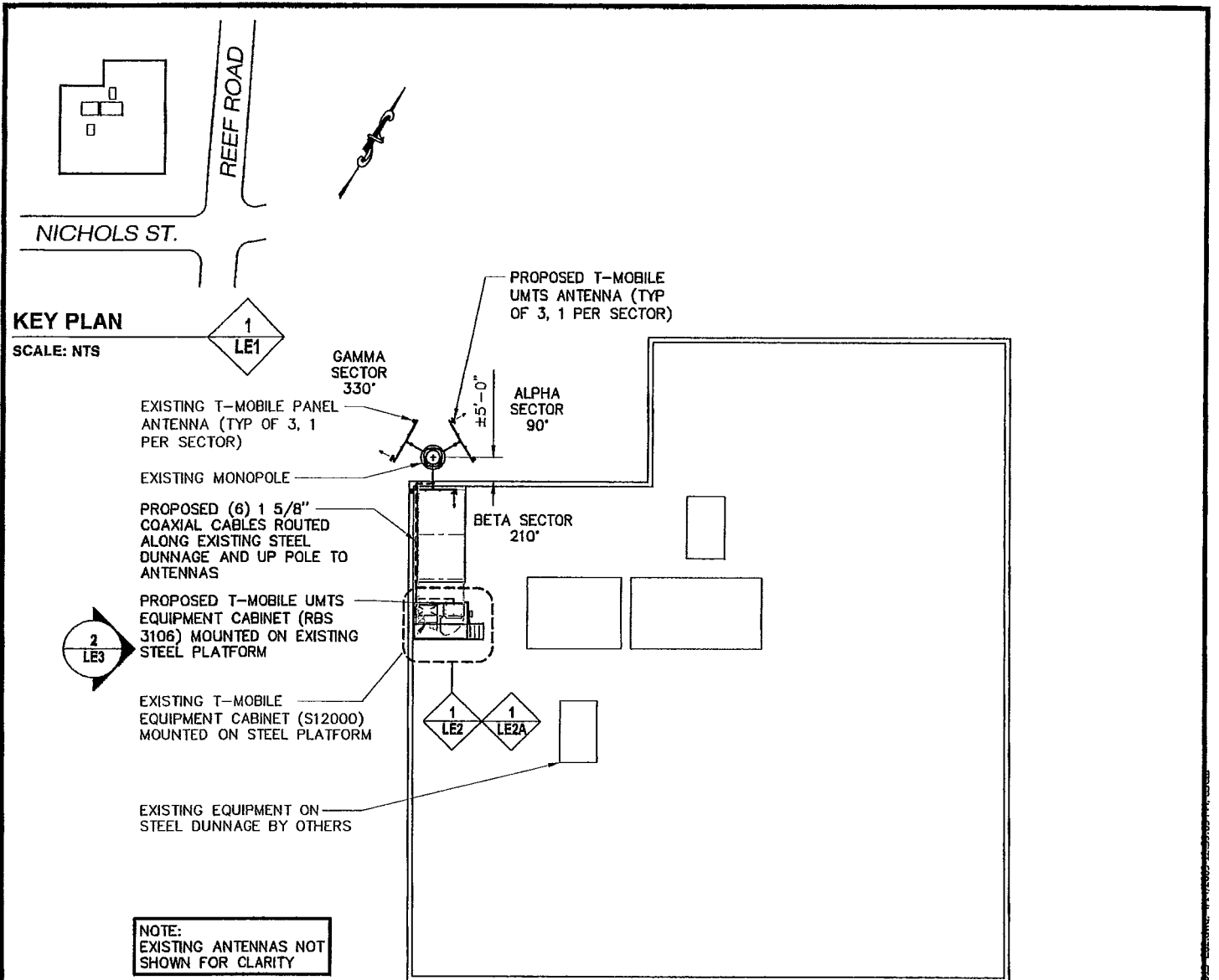
Respectfully yours,



Jennifer Young Gaudet

cc: Honorable Kenneth A. Flatto, First Selectman, Town of Fairfield
(Town of Fairfield is underlying property owner)



Attachments

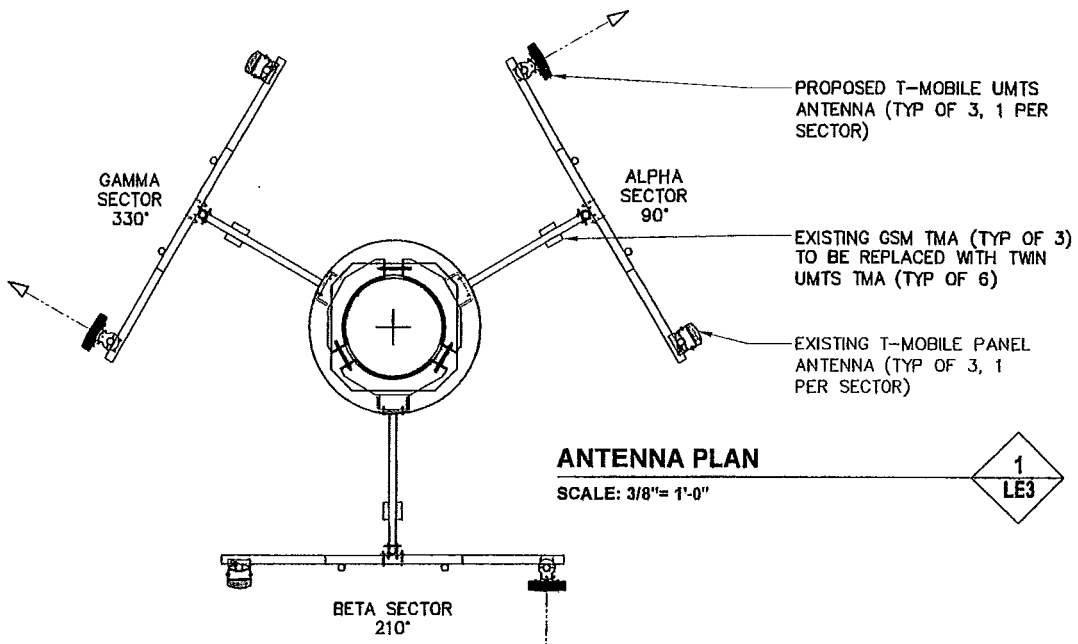


ROOF PLAN
SCALE: 1/32" = 1'-0"

2
LE1

- NOTES:
- LEASE EXHIBITS ARE A CONCEPTUAL DESIGN OF LEASE AGREEMENT ONLY. ACTUAL CONSTRUCTION DOCUMENTS MAY VARY TO COMPLY WITH BUILDING CODES.
 - THE INFORMATION SHOWN IS TAKEN FROM A SURVEY PERFORMED BY "KMB DESIGN GROUP, LLC." DURING SITE VISIT.
 - ELECTRIC/ TELCO SERVICES SHALL BE CONFIRMED PRIOR TO CONSTRUCTION DOCUMENT PHASE.
 - 24 HR. 7 DAYS PER WEEK ACCESS IS REQUIRED FOR SERVICE TECHNICIAN.

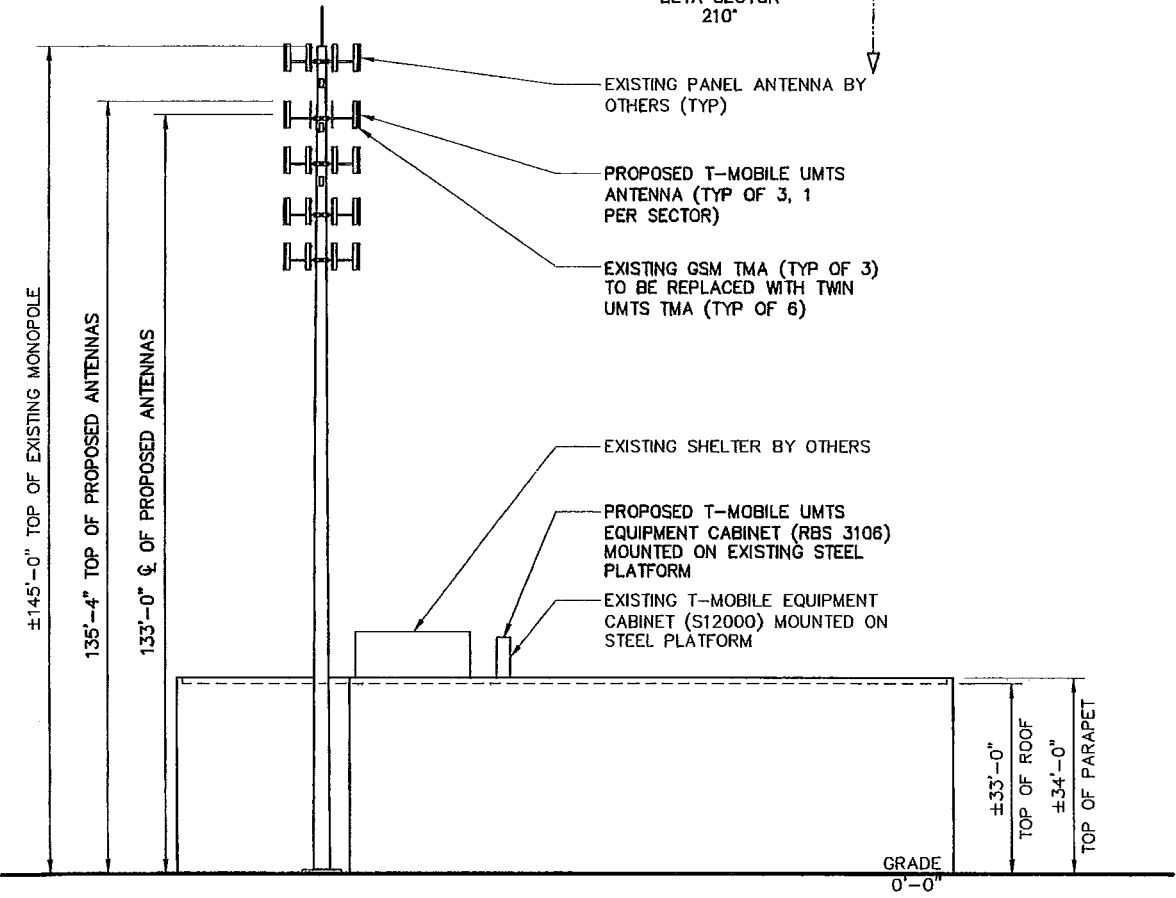
	TITLE:	KEY & ROOF PLAN	PROJECT:	100 REEF ROAD				
	CLIENT:		ADDRESS:	100 REEF ROAD FAIRFIELD, CT 06824 FAIRFIELD COUNTY	3	04-14-09	CCR	
SITE NO:	CT11401A	KMB NO:	350.0004.013	DRAWN BY:	CCR	2	12-02-08	KCD
		CHECKED BY:				1	11-21-08	CCR
						0	11-13-08	CCR
								LE1



ANTENNA PLAN

SCALE: 3/8" = 1'-0"




1
LE3



SOUTHWEST ELEVATION

SCALE: 1/32" = 1'-0"

2
LE3

	TITLE:	ELEVATION	PROJECT:	100 REEF ROAD			
	CLIENT:		ADDRESS:	100 REEF ROAD FAIRFIELD, CT 06824 FAIRFIELD COUNTY	3	04-14-08	CCR
SITE NO: CT11401A	KMB NO:	350.0004.013	DRAWN BY:	CCR	2	12-02-08	KCD
			CHECKED BY:		1	11-21-08	CCR
					0	11-13-08	CCR
					LE3		



**Structural Analysis for
KMB Design Group, LLC**

145' Monopole

**Site Name: Reef Road
Site ID: CT11401
Site Address: 100 Reef Rd., Fairfield, CT 06824**

FDH Project Number 09-02131E S1

Prepared By:

James Mathewson III, EI
Project Engineer

Reviewed By:

Christopher M. Murphy, PE
Vice President
CT PE License No. 25842

FDH Engineering, Inc.

2730 Rowland Rd.
Raleigh, NC 27615
(919)-755-1012
info@fdh-inc.com



March 23, 2009

Prepared pursuant to TIA/EIA-222-F June 1996 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

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EXECUTIVE SUMMARY

At the request of KMB Design Group, LLC, FDH Engineering, Inc. performed an analysis of the monopole located in Fairfield, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F*. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Valmont Industries, Inc. (Order No. 11635-94) Record Drawings dated May 19, 1994, All-Points Technology Corporation (Project No. CT255621) Structural Analysis Report dated April 30, 2008 and KMB Design Group, LLC

The *basic design wind speed* per *TIA/EIA-222-F* standards is 85 mph without ice and 74 mph with 1/2" radial ice.

Conclusions

With the existing and proposed antennas from Omnipoint in place at 133 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards. Furthermore, provided the foundation was designed and constructed to support the original design reactions (See Valmont Order No. 11635-94), the foundation should have the necessary capacity support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the monopole's shaft, but may be installed outside the monopole's shaft in a single row if necessary.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. If the actual layout determined in the field deviates from this layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.

Table 1 – Appurtenance Loading

Existing Loading:

No.	Centerline Elevation (ft)	Coax and Lines ¹	Carrier	Mount Type	Description
1-15	143 ²	(10) 7/8" (6) 1-5/8" (2) 1-1/4"	---	(3) 12' T-Arms	(9) Decibel DB844H90E-XY (3) KMW AM-X-WM-17-65 (2) 8' 4-bay Dipoles (1) 18' x 2.5" Omni
16-20	133 ³	(6) 1-1/4" (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (2) 2' x 2' Panels
21-28	125 ²	(6) 1-1/4" (3) 1-5/8" (2) 1/2"	---	(3) 10' T-Arms	(6) Allgon 7770.00 (1) 8' x 1.5" Omni (1) 3' x 2" Omni (6) LGP2140x TMAs
29-34	116	(6) 1-5/8" (6) 1-5/8" ⁴	Metro PCS	(3) 10' T-Arms	(6) Kathrein 800-10504
35-40	108	(6) 1-5/8"	---	(1) Low Profile Platform	(6) Decibel DB980H90E-M

1 The existing coax is located inside the pole's shaft, unless otherwise noted.

2 Omni and dipole elevations are measured from the bottom of the antenna.

3 The loading for Omnipoint at 133 ft will be altered. See the proposed loading below.

4 Coax is installed outside the monopole's shaft in a single row.

Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-8	133 ¹	(6) 1-1/4" (6) 1-5/8" ² (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (3) RFS APX16DWV-16DWV-S-E-ACU (2) 2' x 2' Panels

1 This represents the final configuration for Omnipoint at 133 ft. According to information provided by KMB, Omnipoint will install (3) RFS APX16DWV-16DWV-S-E-ACU antennas and (6) 1-5/8" coax in addition to the existing loading at 133 ft.

2 Coax is installed outside the monopole's shaft in a single row.

RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

Table 3 displays the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 – Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	145 - 90.83	Pole	TP33.48x23.61x0.281	55.3	Pass
L2	90.83 - 42.83	Pole	TP41.64x31.976x0.375	75.9	Pass
L3	42.83 - 0	Pole	TP48.69x39.7686x0.4375	84.1	Pass
			Anchor Bolts	OK	Pass
			Base Plate	OK	Pass

Table 4 – Maximum Base Reactions

Load Type	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	37 k	37 k
Shear*	30 k	28 k
Moment	2,881 k-ft	3,277 k-ft

* Based on projects of similar type the foundation has been determined to have adequate capacity to resist the additional shear load.

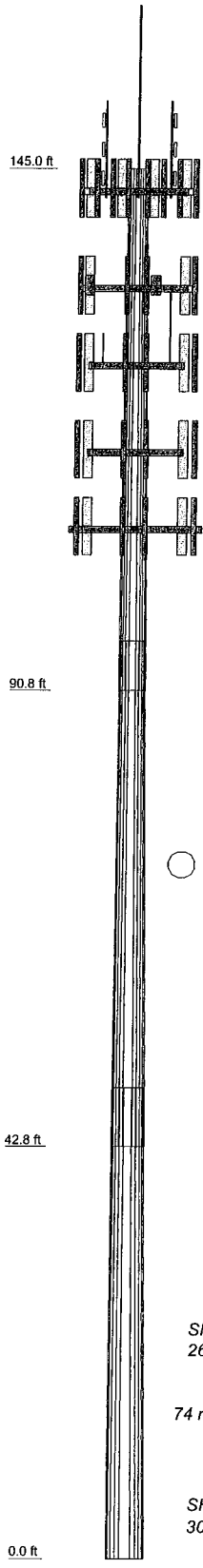
GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of KMB Design Group, LLC to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

Section	1	2	3
Length (ft)	54.17	53.17	49.00
Number of Sides	12	12	12
Thickness (in)	0.2810	0.3750	0.4375
Lap Splice (ft)	5.17	6.17	
Top Dia (in)	23.6100	31.9760	39.7686
Bot Dia (in)	33.4600	41.6400	48.6900
Grade		A572-65	
Weight (K)	4.7	8.0	10.3
			23.0



DESIGNED APPURTENANCE LOADING

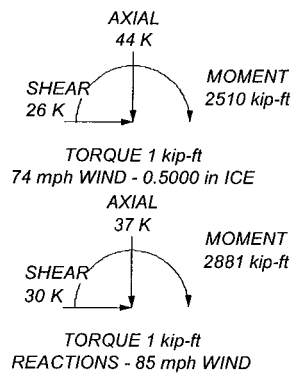
TYPE	ELEVATION	TYPE	ELEVATION
18' x 2.5' omni	152	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	8' x 1.5' omni	129
(3) DB844H90E-XY w/ mount pipe	143	3' x 2' omni	126.5
(3) DB844H90E-XY w/ mount pipe	143	10' T-Arm	125
(3) DB844H90E-XY w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	10' T-Arm	125
12' T-Arms	133	10' T-Arm	125
12' T-Arms	133	10' T-Arm	116
12' T-Arms	133	10' T-Arm	116
RR90-18-00DP w/ mount pipe	133	10' T-Arm	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
RR90-18-00DP w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
RR90-18-00DP w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	13' Low Profile Platform	108
RR90-18-00DP w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108
		(2) DB980H90E-M w/ mount pipe	108

MATERIAL STRENGTH

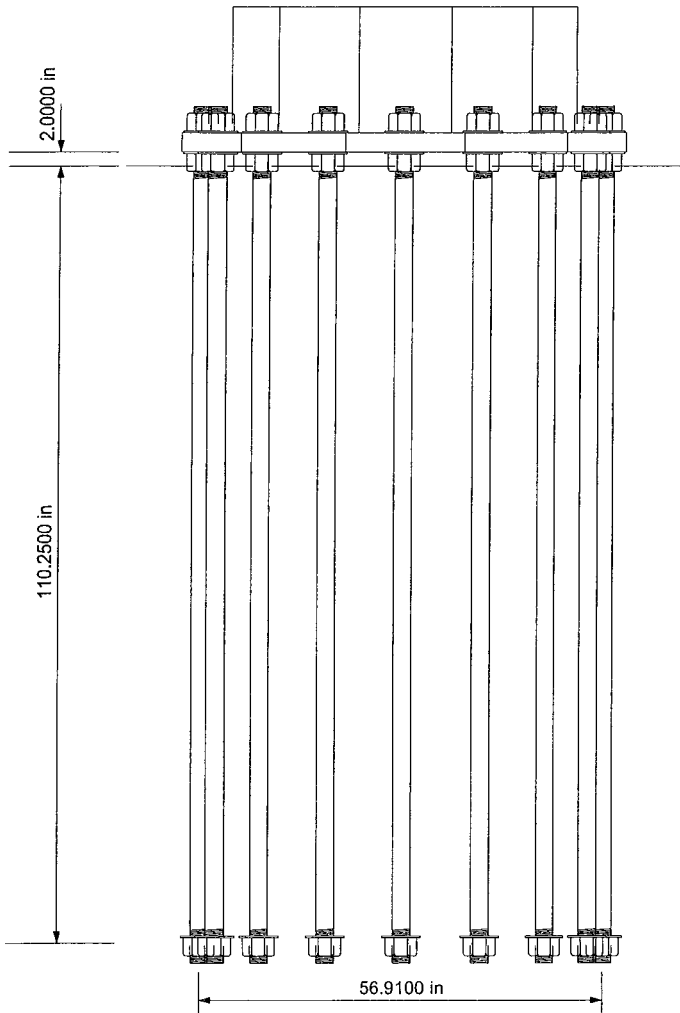
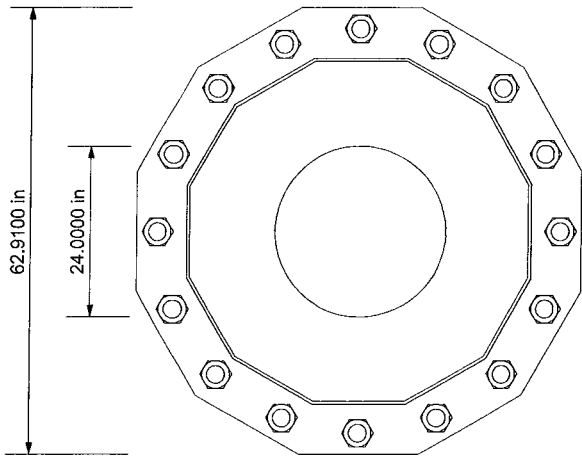
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.




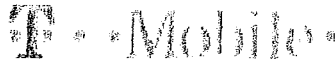
<p>FDH Engineering, Inc. 2730 Rowland Road Raleigh, North Carolina Phone: (919) 755-1012 FAX: (919) 755-1031</p>	<p>Job: Reef Road, CT11401</p>
	<p>Project: 09-02131E S1</p>
	<p>Client: KMB Design Group, LLC Drawn by: James Mathewson III, EIT App'd:</p>
	<p>Code: TIA/EIA-222-F Date: 03/23/09 Scale: NTS</p>
	<p>Path: Dwg No. E-1</p>



FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A633-60.
3. Anchor bolt grade is A615-75.
4. f_c is 4 ksi.

 FDH ENGINEERING, INC. Tower Analysis	FDH Engineering, Inc. 2730 Rowland Road Raleigh, North Carolina Phone: (919) 755-1012 FAX: (919) 755-1031		Job: Reef Road, CT11401 Project: 09-02131E S1 Client: KMB Design Group, LLC Code: TIA/EIA-222-F Path:		Drawn by: James Mathewson III, EIT Date: 03/23/09	App'd: Scale: NTS Dwg No. F-1



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

Technical Memo

From: Farid Marbough - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11401A
Date: April 10, 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 100 Reef Road, Fairfield, 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 (1940-1949.8), (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 133 ft.
- 4) UMTS antenna center line height is 133 ft.
- 5) The maximum transmit power from any GSM sector is 1632 Watts Effective Radiated Power (EIRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2299.8 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 100 Reef Road, Fairfield, CT, is 0.05348 mW/cm². This value represents 5.348% 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 16.5636%. The combined Power Density for the site is 21.912% of the M.P.E. standard.

Connecticut Market



Worst Case Power Density

Site: CT11401A
Site Address: 100 Reef Road
Town: Fairfield
Tower Height: 145 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	165 ft.	Cable Length	165 ft.
Antenna Height	133.0 ft.	Antenna Height	133.0 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	1.9140 dB	Total Cable Loss	1.9140 dB
Total Attenuation	6.4140 dB	Total Attenuation	3.4140 dB
Total EIRP per Channel	53.10 dBm	Total EIRP per Channel	60.61 dBm
(In Watts)	204.00 W	(In Watts)	1149.90 W
Total EIRP per Sector	62.13 dBm	Total EIRP per Sector	63.62 dBm
(In Watts)	1632.00 W	(In Watts)	2299.80 W
nsg	10.0860	nsg	14.5860
Power Density (S) = 0.022199 mW/cm ²		Power Density (S) = 0.031283 mW/cm ²	
T-Mobile Worst Case % MPE =		5.3482%	
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			

Carrier	% of Standard
Verizon	
Cingular	
Sprint	0.0095 %
AT&T Wireless	0.0058 %
Nextel	0.0070 %
MetroPCS	16.5200 %
Other Antenna Systems	0.0213 %
Total Excluding T-Mobile	16.5636 %
T-Mobile	5.3482
Total % MPE for Site	21.9118%

(From CSC power density data base)