



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

March 17, 2009

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

RE: **EM-T-MOBILE-077-090213** - Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 640 Hilliard Street, Manchester, 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 should be installed inside the monopole's shaft, but may be installed outside the monopole's shaft in a single row, if necessary;
- The proposed tower mounted amplifiers shall be installed directly behind the proposed antennas if reasonably feasible; and
- The Council shall be notified in writing that the coax and tower mounted amplifiers were installed as specified.

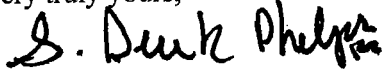
The proposed modifications are to be implemented as specified here and in your notice dated February 12, 2009, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations 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

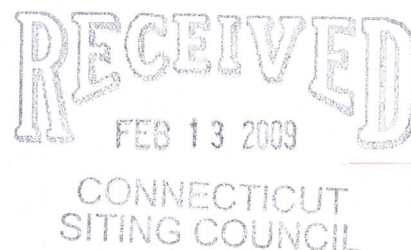
c: The Honorable Louis A. Spadaccini, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester
SBA Network Services, Inc.



EM-T-MOBILE-077-090213

February 12, 2009

ORIGINAL



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

Re: Omnipoint Communications, Inc. – exempt modification
640 Hilliard Street, Manchester, 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 Mayor of Manchester.

T-Mobile plans to modify the existing facility at 640 Hilliard Street, Manchester (coordinates 41°47'04.2” N, -72°33'02.9” W). Attached are a compound plan and 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 147’ AGL on the approximately 150’ tower. T-Mobile’s current installation consists of three antennas and six (3 twin) TMAs; those antennas and TMAs will be replaced in the same flush-mounted configuration. The modifications will not extend the height of the tower.

Mr. S. Derek Phelps

February 12, 2009

Page 2

2. The proposed changes will not extend the site boundaries. T-Mobile will install one additional cabinet on the existing concrete pad at the base of the tower. Thus, there will be no effect on the site compound.
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 4.2522%. No other carriers are present on the tower.

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

Respectfully yours,

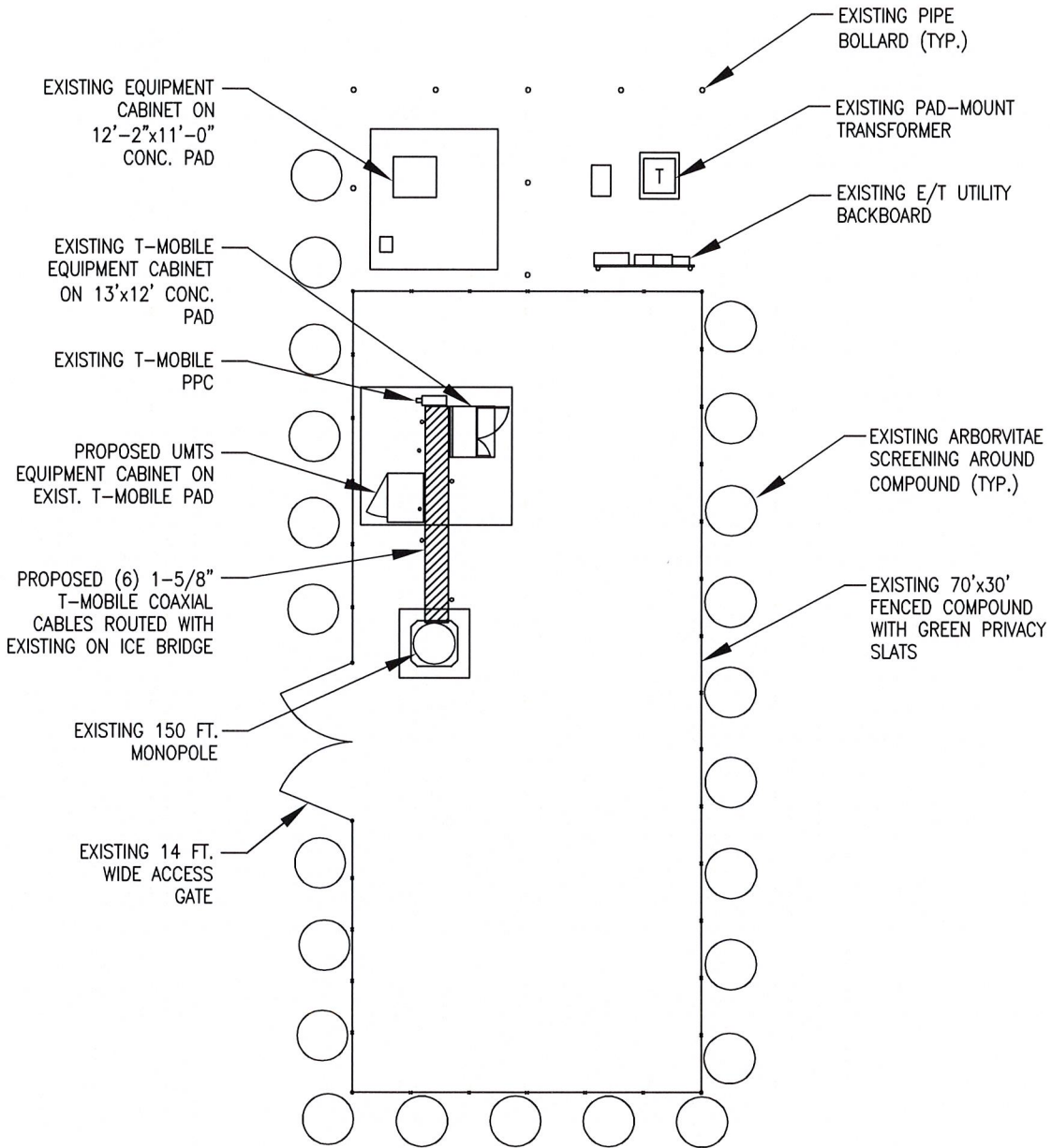


Jennifer Young Gaudet

cc: Honorable Louis A. Spadaccini, Mayor, Town of Manchester
Scott Shanley, General Manager, Town of Manchester
Macabee Properties LLC (underlying property owner)

Attachments

NORTH






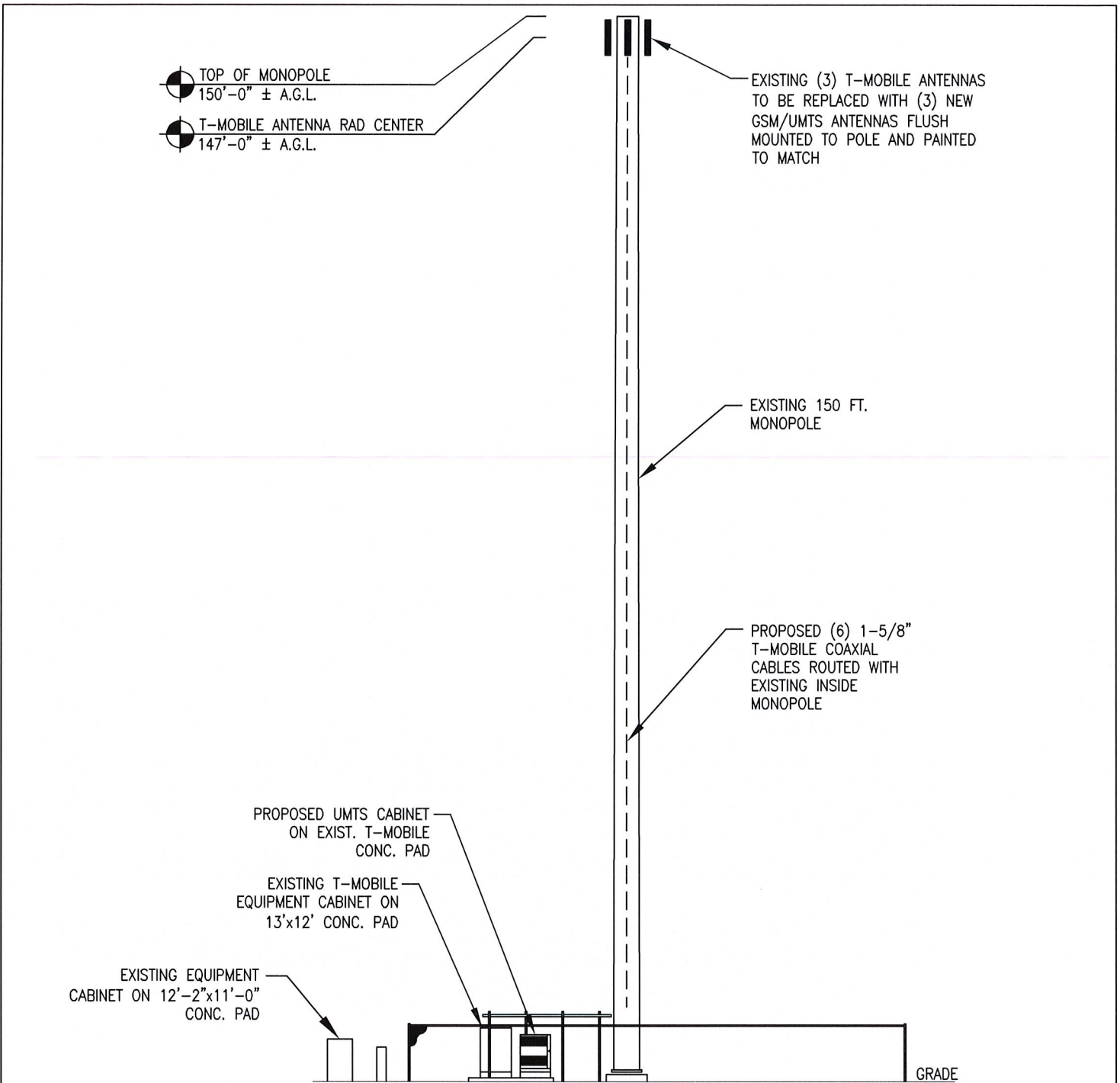
1
LE-1

COMPOUND PLAN
SCALE: 1"=15'-0"

REFERENCE NOTE:

THIS PLAN/ELEVATION IS BASED ON ORIGINAL DESIGN DRAWINGS PROVIDED BY AND FOR OMNIPOINT COMMUNICATIONS, INC. AS PREPARED BY CLOUGH HARBOUR & ASSOCIATES LLP, DATED 12-20-07 AND A LIMITED FIELD INVESTIGATION BY ON AIR ENGINEERING, LLC ON 11-19-08 AND IS SUBJECT TO A CURRENT COMPOUND/ELEVATION SURVEY.

Approved By: OWNER/SAC: _____ DATE: _____	Client:   35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002	Project: SBA CT13063 Address: 640 HILLIARD ST. MANCHESTER, CT 06040 Site ID: CTHA071D Project Name: UMTS	
Approved By: CONSTRUCTION: _____ DATE: _____		P.M.: _____ Drawn: AG Chkd. by: DW Date: 11-21-08	Drawing Title: COMPOUND PLAN Drawing No. LE-1
Approved By: RF ENGINEER: _____ DATE: _____		 On Air Engineering, LLC 88 FOUNDRY POND RD., COLD SPRING, NY 10516	



TOP OF MONOPOLE
150'-0" ± A.G.L.

T-MOBILE ANTENNA RAD CENTER
147'-0" ± A.G.L.

EXISTING (3) T-MOBILE ANTENNAS
TO BE REPLACED WITH (3) NEW
GSM/UMTS ANTENNAS FLUSH
MOUNTED TO POLE AND PAINTED
TO MATCH

EXISTING 150 FT.
MONOPOLE

PROPOSED (6) 1-5/8"
T-MOBILE COAXIAL
CABLES ROUTED WITH
EXISTING INSIDE
MONOPOLE

PROPOSED UMTS CABINET
ON EXIST. T-MOBILE
CONC. PAD

EXISTING T-MOBILE
EQUIPMENT CABINET ON
13'x12' CONC. PAD

EXISTING EQUIPMENT
CABINET ON 12'-2"x11'-0"
CONC. PAD

GRADE

REFERENCE NOTE:

THIS PLAN/ELEVATION IS BASED ON ORIGINAL DESIGN DRAWINGS PROVIDED BY AND FOR OMNIPPOINT COMMUNICATIONS, INC. AS PREPARED BY CLOUGH HARBOUR & ASSOCIATES LLP, DATED 12-20-07 AND A LIMITED FIELD INVESTIGATION BY ON AIR ENGINEERING, LLC ON 11-19-08 AND IS SUBJECT TO A CURRENT COMPOUND/ELEVATION SURVEY.

1 WEST ELEVATION
LE-2 SCALE: 1"=20'-0"

Approved By: OWNER/SAC: _____ DATE: _____ Approved By: CONSTRUCTION: _____ DATE: _____ Approved By: RF ENGINEER: _____ DATE: _____	Client:   35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002	Project: SBA CT13063 Address: 640 HILLIARD ST. MANCHESTER, CT 06040 Site ID: CTHA071D Project Name: UMTS
 On Air Engineering, LLC 88 FOUNDRY POND RD., COLD SPRING, NY 10516	P.M.: Drawn: AG Chkd. by: DW Date: 11-21-08	Drawing Title: WEST ELEVATION Drawing No. LE-2



**Structural Analysis for
SBA Network Services, Inc.**

149' Monopole

**Site Name: Middle Turnpike
Site ID: CT13063-A**

FDH Project Number 09-01125E 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., Suite 100
Raleigh, NC 27615
(919)-755-1012
info@fdh-inc.com



February 3, 2009

Prepared pursuant to ANSI TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	3
Conclusions	
Recommendations	
APPURTENANCE LISTING.....	4
RESULTS.....	5
GENERAL COMMENTS.....	6
LIMITATIONS.....	6
POLE PROFILE.....	7
BASE TOWER SECTION.....	8

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed an analysis of the monopole located in Manchester, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G*. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Sabre Communication Corp. (Job No. 08-01015 Revision A) Structural Design Report dated February 15, 2008, FDH, Inc. (Project No. 08-07128T) TIA Inspection Report dated October 12, 2008 and SBA Network Services, Inc.

The *basic design wind speed* per *ANSI/TIA-222-G* standards is 100 mph without ice and 50 mph with 1" radial ice. Ice is considered to increase in thickness with height. Furthermore, the tower was analyzed as Exposure Category B.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 147 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standards. Furthermore, provided the foundation was constructed per the original design drawings (see Sabre Job No. 08-01015), the foundation should have the necessary capacity to 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 *ANSI/TIA-222-G* 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.
2. The proposed TMAs should be installed directly behind the proposed antennas.

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 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
1-3	147 ²	(12) 1-5/8" (1) 1/4"	T-Mobile	(3) 6' x 2.34" Pipe Mounts	(3) Andrew RR90-17-XXDP (3) CDM DTMA-1819-DD-12 TMAs

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

2 The loading for T-Mobile at 147 ft will be altered. See the proposed loading below.

Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-9	147 ¹	(18) 1-5/8" (1) 1/4"	T-Mobile	(1) 13' Low Profile Platform	(3) Andrew TMZXXX-6516-R2M (6) Andrew RR90-17-XXDP (3) RFS ATMAA1412D-1A20 TMAs (3) Andrew ETW190VS12UB TMAs

1 This represents the final configuration for T-Mobile at 147 ft. According to information provided by SBA, T-Mobile will remove (3) Andrew RR90-17-XXDP antennas and (3) CDM DTMA-1819-DD-12 TMAs and install (3) Andrew TMZXXX-6516-R2M antennas, (3) RFS ATMAA1412D-1A20 TMAs, (3) Andrew ETW190VS12UB TMAs and (6) 1-5/8" coax at 147 ft. T-Mobile reserves the right to install (1) 13' Low Profile Platform and an additional (6) Andrew RR90-17-XXDP.

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
Flange Plate	60 ksi
Flange Bolts	92 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

Table 3 displays the ratio (as a percentage) of factored 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	149 - 109	Pole	TP29.16x24x0.1875	31.1	Pass
L2	109 - 98	Pole	TP30.58x29.16x0.1875	38.0	Pass
L3	98 - 48.5	Pole	TP36.59x29.6886x0.25	61.1	Pass
L4	48.5 - 0	Pole	TP42.35x35.4773x0.375	62.8	Pass
	109		Flange Bolts	OK	Pass
	109		Flange Plate	OK	Pass
			Anchor Bolts	OK	Pass
			Base Plate	OK	Pass

Table 4 – Maximum Base Reactions

Load Type	Current Analysis (ANSI/TIA-222-G)	Original Design (ANSI/TIA-222-G)
Axial	25 k	37 k
Shear	17 k	20 k
Moment	1,504 k-ft	1,716 k-ft

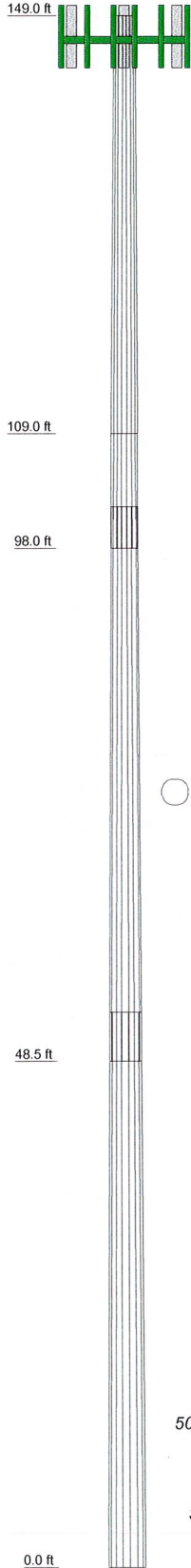
GENERAL COMMENTS

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 SBA Network Services, Inc. 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	4	3	2	1
Length (ft)	53.25	53.50	11.00	40.00
Number of Sides	16	16	16	16
Thickness (in)	0.3750	0.2500	0.1875	0.1875
Lap Splice (ft)	4.75		4.00	
Top Dia (in)	35.4773	29.6886	29.1600	24.0000
Bot Dia (in)	42.3500	36.5900	30.5800	29.1600
Grade	A572-65	A572-65		
Weight (K)	15.9	4.8	0.7	2.1



DESIGNED APPURTENANCE LOADING

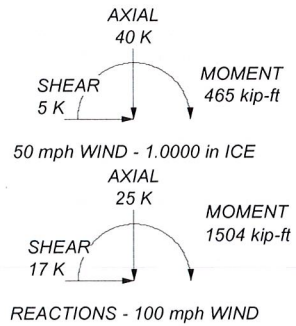
TYPE	ELEVATION	TYPE	ELEVATION
13' Low Profile Platform	147	ETW190VS12UB TMA	147
(2) RR90-17-XXDP w/ mount pipe	147	ETW190VS12UB TMA	147
(2) RR90-17-XXDP w/ mount pipe	147	ETW190VS12UB TMA	147
(2) RR90-17-XXDP w/ mount pipe	147	ATMAA1412D-1A20 TMA	147
TMZXXX-6516-R2M w/ mount pipe	147	ATMAA1412D-1A20 TMA	147
TMZXXX-6516-R2M w/ mount pipe	147	ATMAA1412D-1A20 TMA	147
TMZXXX-6516-R2M w/ mount pipe	147	ATMAA1412D-1A20 TMA	147

MATERIAL STRENGTH

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

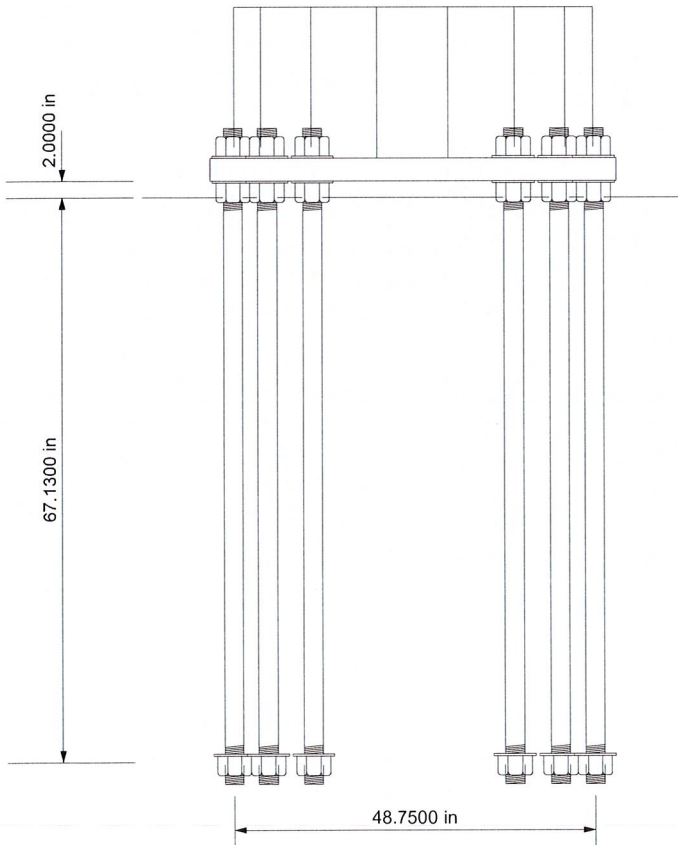
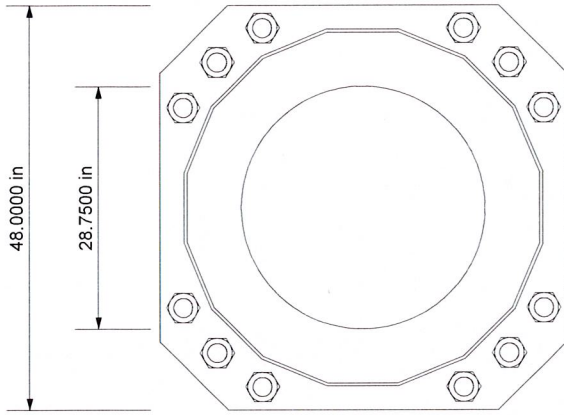
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. TOWER RATING: 62.8%




FDH Engineering, Inc.
 2730 Rowland Road, Suite 100
 Raleigh, North Carolina
 Phone: (919) 755-1012
 FAX: (919) 755-1031

Job: **Middle Turnpike, CT13063-A**
 Project: **09-01125E S1**
 Client: SBA Network Services, Inc. | Drawn by: James Mathewson III, EIT | App'd:
 Code: TIA-222-G | Date: 02/03/09 | Scale: NTS
 Path: | Dwg No. E-1



FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A607-60.
3. Anchor bolt grade is A615-75.
4. f_c is 4 ksi.

 FDH ENGINEERING, INC. Tower Analysis	FDH Engineering, Inc. 2730 Rowland Road, Suite 100 Raleigh, North Carolina Phone: (919) 755-1012 FAX: (919) 755-1031		Job: Middle Turnpike, CT13063-A	
	Project: 09-01125E S1		Drawn by: James Mathewson III, EIT	
	Client: SBA Network Services, Inc.		Date: 02/03/09	
	Code: TIA-222-G		Scale: NTS	
	Path:		Dwg No. F-1	

Technical Memo

To: HPC
From: Farid Marbough - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTHA071D
Date: February 12, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile PCS antenna installation on a Monopole at 640 Hilliard Street, Manchester, 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 1 antennas per sector.
- 3) The model number for GSM antenna is TMZXXX-6516-R2M.
- 3) The model number for UMTS antenna is TMZXXX-6516-R2M.
- 4) GSM antenna center line height is 147 ft.
- 4) UMTS antenna center line height is 147 ft.
- 5) The maximum transmit power from any GSM sector is 1928.95 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 1924.38 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 PCS antenna installation on a Monopole at 640 Hilliard Street, Manchester, CT, is 0.04252 mW/cm². This value represents 4.252% 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.

Connecticut Market



Worst Case Power Density

Site: CTHA071D
Site Address: 640 Hilliard Street
Town: Manchester
Tower Height: 149 ft.
Tower Style: Monopole

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	TMZXXX-6516-R2M	Antenna Model	TMZXXX-6516-R2M
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	180 ft.	Cable Length	180 ft.
Antenna Height	147.0 ft.	Antenna Height	147.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	17.4 dBi	Antenna Gain	17.4 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	2.0880 dB	Total Cable Loss	2.0880 dB
Total Attenuation	6.5880 dB	Total Attenuation	3.5880 dB
Total EIRP per Channel (In Watts)	53.82 dBm 241.12 W	Total EIRP per Channel (In Watts)	59.83 dBm 962.19 W
Total EIRP per Sector (In Watts)	62.85 dBm 1928.95 W	Total EIRP per Sector (In Watts)	62.84 dBm 1924.38 W
nsg	10.8120	nsg	13.8120
Power Density (S) = 0.021286 mW/cm ²		Power Density (S) = 0.021236 mW/cm ²	
T-Mobile Worst Case % MPE =		4.2522%	
Equation Used : $S = \frac{(1000)(grf)^2 (Power)^{nsg}}{4\pi (R)^2}$			
Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997			

Co-Location Total

Carrier	% of Standard
Verizon	
Cingular	
Sprint	
AT&T Wireless	
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	0.0000 %
T-Mobile	4.2522
Total % MPE for Site	4.2522%