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
www.ct.gov/csc

April 2, 2009

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

RE: **EM-T-MOBILE-155-090302** - Omnipoint Communications (T-Mobile) notice of intent to modify an existing telecommunications facility located at 467 South Quaker Lane, West Hartford, 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.

The proposed modifications are to be implemented as specified here and in your notice dated February 27, 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

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Scott Slifka, Mayor, Town of West Hartford
Barry M. Feldman, Town Manager, Town of West Hartford
Mila Limson, Town Planner, Town of West Hartford
Hans Fiedler, T-Mobile USA, Inc.

HPC DEVELOPMENT LLC

EM-T-MOBILE-155-090302

ORIGINAL

RECEIVED
MAR 2 2009
CONNECTICUT SITING COUNCIL

VIA OVERNIGHT DELIVERY

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

Re: Omnipoint Communications, Inc. – exempt modification
467 South Quaker Lane, West Hartford, 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 West Hartford.

T-Mobile plans to modify the existing facility at 467 South Quaker Lane, West Hartford owned by T-Mobile (coordinates 41°44'55.5" N, -72°43'52.8" 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 120' AGL on the approximately 120' tower. T-Mobile will remove its eight existing panel antennas and replace them with nine antennas, all on the existing platform at the top of the tower. Two

additional coaxial cables and two TMAs will also be added. The modifications will not extend the height of the tower.

2. The proposed changes will not extend the site boundaries. T-Mobile will install one additional cabinet on a new concrete pad adjacent to its existing equipment at the base of the tower.

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 0.1317%; the combined site operations will result in a total power density of 25.6217%.

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

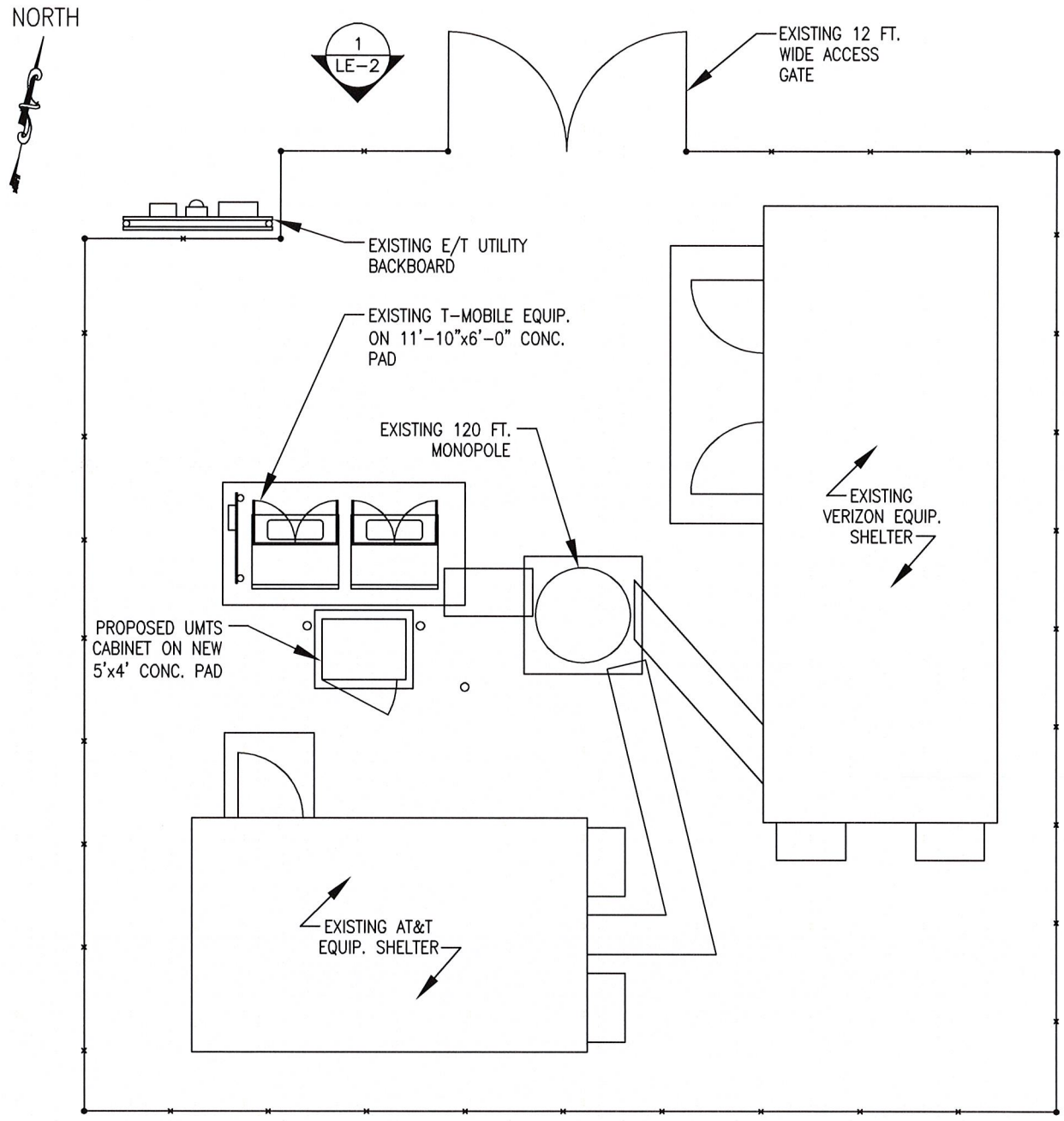
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

cc: Honorable Scott Slifka, Mayor, Town of West Hartford
Church of Saint Mark the Evangelist Corp. (underlying property owner)

Attachments

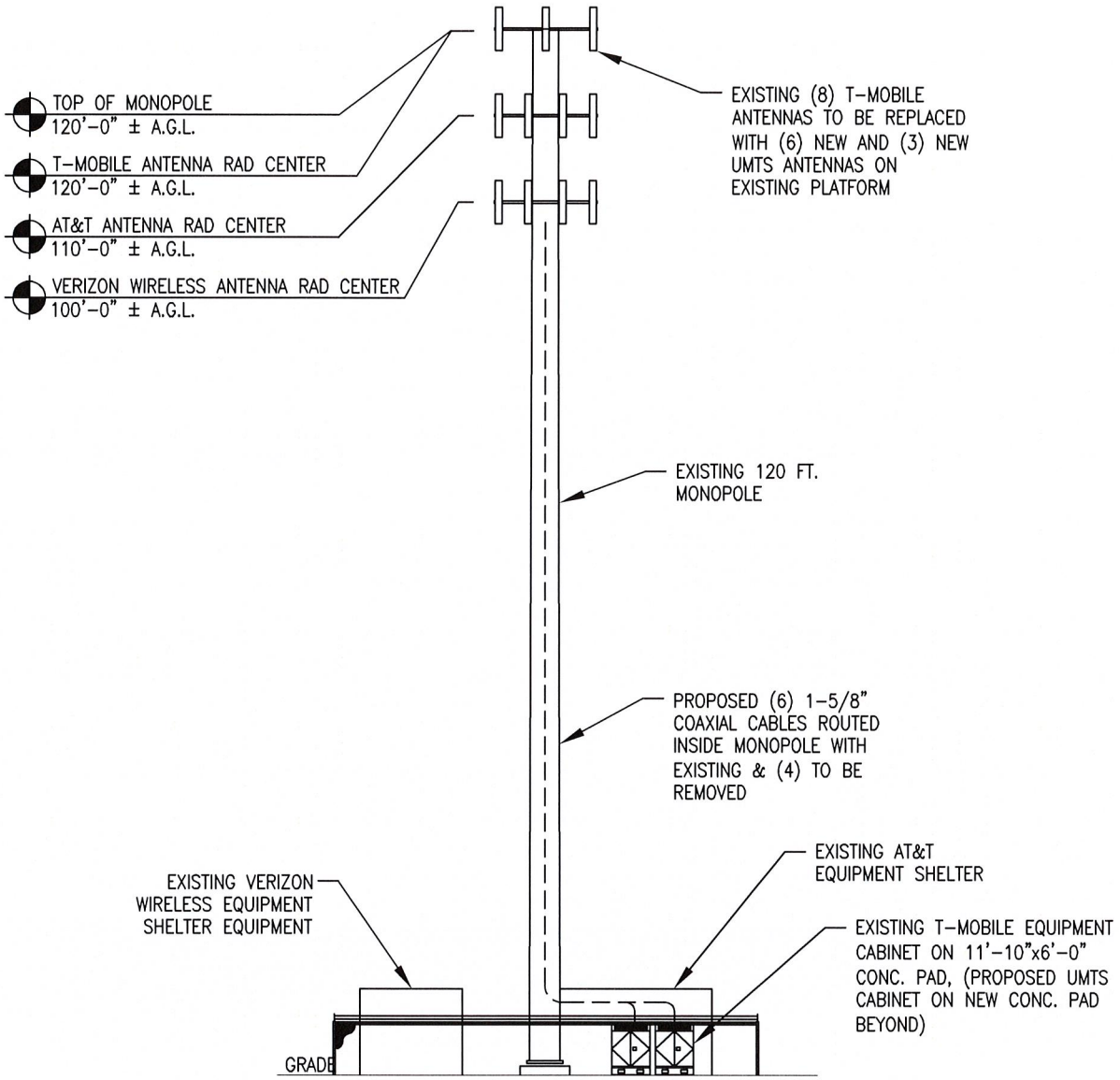


1 LE-1 COMPOUND PLAN
SCALE: 1/8"=1'-0"

REFERENCE NOTE:
THIS PLAN/ELEVATION IS BASED ON ORIGINAL DESIGN DRAWINGS PROVIDED BY AND FOR OMNIPOINT COMMUNICATIONS, INC. AS PREPARED BY NATCOMM, L.L.C., DATED 4-24-01 AND A LIMITED FIELD INVESTIGATION BY ON AIR ENGINEERING, LLC ON 11-20-08 AND IS SUBJECT TO A CURRENT COMPOUND/ELEVATION SURVEY.

Approved By: OWNER/SAC: _____ DATE: _____ Approved By: CONSTRUCTION: _____ DATE: _____ Approved By: RF ENGINEER: _____ DATE: _____	Client: HPC DEVELOPMENT LLC T-Mobile 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002	Project: CHURCH OF ST. MARK MONOPOLE Address: 467 SOUTH QUAKER LANE, WEST HARTFORD, CT 06110 Site ID: CT-11-178-A Project Name: UMTS

On Air Engineering, LLC 88 FOUNDRY POND RD., COLD SPRING, NY 10516	P.M.:	Drawn: AG	Chkd. by: DW	Date: 11-24-08	Drawing Title: COMPOUND PLAN	Drawing No. LE-1



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

REFERENCE NOTE:
THIS PLAN/ELEVATION IS BASED ON ORIGINAL DESIGN DRAWINGS PROVIDED BY AND FOR OMNIPOINT COMMUNICATIONS, INC. AS PREPARED BY NATCOMM, L.L.C., DATED 4-24-01 AND A LIMITED FIELD INVESTIGATION BY ON AIR ENGINEERING, LLC ON 11-20-08 AND IS SUBJECT TO A CURRENT COMPOUND/ELEVATION SURVEY.

Approved By: OWNER/SAC: _____ DATE: _____ Approved By: CONSTRUCTION: _____ DATE: _____ Approved By: RF ENGINEER: _____ DATE: _____	Client: HPC DEVELOPMENT LLC T-Mobile 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002	Project: CHURCH OF ST. MARK MONOPOLE Address: 467 SOUTH QUAKER LANE, WEST HARTFORD, CT 06110 Site ID: CT-11-178-A Project Name: UMTS
On Air Engineering, LLC 88 FOUNDRY POND RD., COLD SPRING, NY 10516	P.M.:	Drawn: AG / Chkd. by: DW / Date: 11-24-08
Drawing Title: NORTH ELEVATION	Drawing No.: LE-2	

NATCOMM INC.
CONSULTING ENGINEERS

Structural Analysis Report

120' Existing Monopole

New Cingular Wireless/AT&T Site Ref:
5258 West Hartford – St. Marks

T-Mobile Site Ref: CT-11-178D
457 Quaker Lane South
West Hartford, CT

Natcomm Project No. 08165

~~Date: December 01, 2008~~
Rev 1: January 9, 2009

Prepared for:

New Cingular Wireless PCS LLC
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

p: 203.488.0580
f: 203.488.8587
w: nat-eng.com
63-2 N. Branford Rd.
Branford, CT 06405

Natcomm, Inc.
Structural Monopole Analysis
120' Existing PiROD Monopole
West Hartford, CT
Revision 1 ~ January 9, 2009

Table of Contents

Natcomm, Inc.
Structural Monopole Analysis
120' Existing PiROD Monopole
West Hartford, CT
Revision 1 ~ January 9, 2009

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation proposed by AT&T on the existing monopole (tower) located in West Hartford, Connecticut.

The host tower is a 120-ft, four-section, sixteen sided, tapered monopole originally designed and manufactured by PiROD Inc., eng file no. A-116876, Revision B, dated May 05, 2000. The tower geometry, structure member sizes and foundation system information were taken from PiROD's design report. Antenna and appurtenance information were obtained from a previous structural analysis report prepared by Natcomm Inc., signed and sealed October 30, 2008.

The above reference materials are available for reference in Section 4 of this report.

The tower is made up of four (4) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 22.27-in at the top and 49.06-in at the base.

AT&T proposes the removal of twelve (12) existing panel antennas and the installation of six (6) panel antennas, six (6) TMA's and six (6) Diplexer's mounted to the existing monopole. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna configuration.

Antenna and Appurtenance Summary

The existing tower was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- T-MOBILE (Existing/Reserved):
  Antennas: Twelve (12) APXV18-206517S-C panel antennas, twelve (12) TMA's and one (1) 4-ft Dish on an existing 13' Low Profile Platform with a RAD center elevation of 120-ft above the existing tower base plate.
  Coax Cables: Twenty-five (25) 1-5/8" ∅ coax cables running on the inside of the existing tower.
- VERIZON (Existing):
  Antennas: Six (6) Antel WPA-80090/4CF, six (6) Andrew DB948F85T2E-M panel antennas and one (1) GPS antenna on a 13' Low Profile Platform with a RAD center elevation of 100-ft above the existing tower base plate.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the inside of the existing tower.
- POCKET WIRELESS (Reserved):
  Antennas: Three (3) Kathrein 742-213 panel antennas flush mounted on a universal tri-bracket assembly at a RAD center elevation of 90-ft above the existing tower base plate.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the inside of the existing tower.

- AT&T (Remove):
  Antennas: Twelve (12) existing panel antennas.

- **AT&T (Proposed):**
  Antennas: Install six (6) Powerwave 7770 panel antennas, six (6) Powerwave LGP21401 TMA's and six (6) Powerwave LGP21903 Diplexer's all on an existing 13-ft Low Profile Platform at a RAD center elevation of 110-ft above the existing tower base plate.

- AT&T (Existing to remain)
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the inside of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed within tower.
- A new porthole will not be required.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled RISATower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 80 mph basic wind speed (fastest mile) with no ice and 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	West Hartford; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed controls	
Load Cases:	Load Case 1; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design of monopole towers.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed. This load case typically controls the design of lattice towers.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1610.1.3 of State Bldg. Code 2005] does not control in the design of this structure type*

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software RISATower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

Calculated stresses were found to be within allowable limits. In Load Case 1, per RISATower "Section Capacity Table", this tower was found to be at **51.6%** of its total capacity.

Foundation and Anchors

The existing foundation consists of a 6-ft square reinforced concrete pedestal and 16.67-ft square reinforced concrete pad bearing directly on existing sub grade. The existing foundation was previously reinforced by installing four (4) helical anchor details of which are outlined in design drawing 'S-1' prepared by Natcomm, LLC., dated May 29, 2007 available in Section 4 of this report. The sub-grade conditions used in the analysis of the existing foundation were obtained from Jaworski Geotech, Inc's (JGI) geotechnical report JGI project no. J2075170G, dated April 24, 2007 also available in Section 4 of this report. The monopole tower is connected to the pedestal by means of thirty-three (33) 1-1/4" diameter, A687 anchor bolts embedded approximately 4-ft 3-in into the concrete foundation structure.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:
  - Shear Force @ top of pedestal = **19** kips
  - Moment @ top of pedestal = **1529** ft-kips
  - Axial Force @ top of pedestal = **29** kips
- The base plate, anchor bolts and the foundation are within allowable limits.
- Foundation resists two times the calculated wind load per the requirements of Section 3108.4.2 of the 2005 CT State Building Code Supplement to the 2003 International Building Code (IBC).
- The tower foundation was found to be at **99%** of its total capacity.

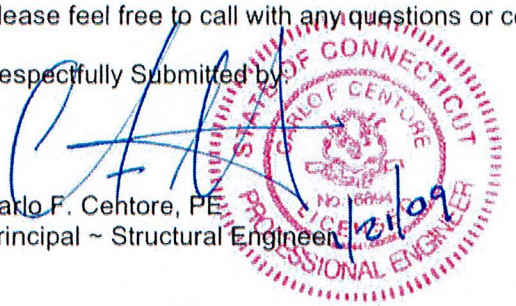
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Natcomm, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Carlo F. Centore, PE
Principal ~ Structural Engineer

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: HPC
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11178D
Date: February 27, 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 467 South Quaker Lane (Church of St. Mark), West Hartford, 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 4 antennas per sector.
3) The model number for GSM antenna is APXV18-206517-C.
3) The model number for UMTS antenna is APXV18-206517-C.
4) GSM antenna center line height is 120 ft.
4) UMTS antenna center line height is 120 ft.
5) The maximum transmit power from any GSM sector is 39.06 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 38.97 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 467 South Quaker Lane (Church of St. Mark), West Hartford, CT, is 0.00132 mW/cm^2. This value represents 0.132% 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 25.49%. The combined Power Density for the site is 25.622% of the M.P.E. standard.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CT11178D**
Site Address:	**467 South Quaker Lane (Church of St. Mark)**
Town:	**West Hartford**
Tower Height:	**120 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	APXV18-206517-C	Antenna Model	APXV18-206517-C
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	140 ft.	Cable Length	140 ft.
Antenna Height	120.0 ft.	Antenna Height	120.0 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	0.0 dBi	Antenna Gain	0.0 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	1.6240 dB	Total Cable Loss	1.6240 dB
Total Attenuation	6.1240 dB	Total Attenuation	3.1240 dB
Total EIRP per Channel	36.89 dBm	Total EIRP per Channel	42.90 dBm
(In Watts)	4.88 W	(In Watts)	19.48 W
Total EIRP per Sector	45.92 dBm	Total EIRP per Sector	45.91 dBm
(In Watts)	39.06 W	(In Watts)	38.97 W
nsg	-6.1240	nsg	-3.1240
Power Density (S) =	0.000659 mW/cm^2	Power Density (S) =	0.000658 mW/cm^2
T-Mobile Worst Case % MPE =		0.1317%	

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	22.0400 %
Cingular	
Sprint	
AT&T Wireless	3.4500 %
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	**25.4900 %**
T-Mobile	0.1317
Total % MPE for Site	**25.6217%**