



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

December 29, 2010

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

RE: **EM-T-MOBILE-014-101208** – T-Mobile USA, Inc. notice of intent to modify an existing telecommunications facility located at 60 Hosley Avenue, Branford, Connecticut.

Dear Attorney Regan:

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

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated December 8, 2010. 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. Thank you for your attention and cooperation.

Very truly yours,



Linda Roberts
Executive Director

LR/CDM/laf

- c: The Honorable Anthony "Unk" DaRos, First Selectman, Town of Branford
- Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
- Justine K. Gillen, Zoning Enforcement Officer, Town of Branford



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

December 15, 2010

The Honorable Anthony "Unk" DaRos
First Selectman
Town of Branford
Town Hall
1019 Main Street
P. O. Box 150
Branford, CT 06405-0150

RE: **EM-T-MOBILE-014-101208** – T-Mobile Northeast LLC notice of intent to modify an existing telecommunications facility located at 60 Hosley Avenue, Branford, Connecticut.

Dear First Selectman DaRos:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by December 30, 2010.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford

Em-T-Mobile -014-101208

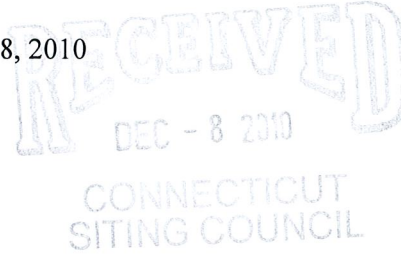


THOMAS J. REGAN
Direct Dial: (860) 509-6522
tregan@brownrudnick.com

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

Via Hand Delivery

December 8, 2010



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

RE: Notice of Exempt Modification / Branford @ 60 Hosley Avenue

Dear Mr. Caruso:

On behalf of T-Mobile USA, Inc. ("T-Mobile"), enclosed for filing are an original and five (5) copies of T-Mobile's Notice of Exempt Modification for a Facility located at the above-referenced site.

I also enclose herewith a check in the amount of \$625.00 representing the filing fee.

I would appreciate it if you would date-stamp the enclosed copy of this transmittal letter and return it to the courier delivering this package.

If you have any questions, please feel free to contact me.

Very truly yours,

BROWN RUDNICK LLP

By: Thomas J. Regan
Thomas J. Regan

Enclosures

cc w/ encl. via 1st Class Mail – First Selectman Anthony DaRos

40279541 v1 - REGANTJ - 025064/0016

b
r
o
w
n
r
u
d
n
i
c
k
c
o
m

In re:

T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility at 60 Hosley Avenue, Branford, Connecticut. : **EXEMPT MODIFICATION NO.** _____
: _____
: December 8, 2010

RECEIVED
DEC - 8 2010

NOTICE OF EXEMPT MODIFICATION

CONNECTICUT
SITING COUNCIL

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc. (“T-Mobile”) hereby gives notice to the Connecticut Siting Council (“Council”) and the Town of Branford of T-Mobile’s intent to make an exempt modification to the existing tower (the “Tower”) located at 60 Hosley Avenue, Branford, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System (“UMTS”). UMTS is a third-generation (“3G”) technology that utilizes a code division multiple access (“CDMA”) base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

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

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

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

The Tower is a 150-foot monopole located at 60 Hosley Avenue in Branford, Connecticut (latitude N 41° 16' 56 longitude W -72° 51' 07"). The Tower is owned by Amtrak and its equipment is also located on the Tower. Currently, T-Mobile has 3 GSM panel antennas, 1 antenna on a PiROD platform and 6 Tower Mounted Amplifiers ("TMA") with a centerline of 150 feet located on the Tower. A site plan with Tower specifications is attached.

Specifically, T-Mobile plans to install 3 additional UMTS panel antennas and remove and replace its 6 existing TMA. The 6 existing TMA will be replaced with 3 PCS TMA and 3 AWS TMA. The centerline of the new antennas and TMAs will remain at 150 feet. T-Mobile will continue to utilize its 6 existing coax cables and plans to install 6 additional 1-5/8 inch coax cables.

To confirm the Tower can support these changes, T-Mobile commissioned Centek Engineering to perform a structural analysis of the Tower (attached). According to the Structural Analysis Report, dated October 25, 2010, "...the subject tower is adequate to support the proposed modified antenna configuration" (Section, 1-5, Structural Analysis Report).

In addition, T-Mobile proposes to install 1 new UMTS equipment cabinet on its existing 11-foot, 6-inch by 16-foot (approximately) concrete pad and its proposed 1-foot, 6-inch by 4-foot, 9-inch (approximately) concrete pad extension. Please see page L-2 of the site plan for exact locations. T-Mobile also proposes to install an access gate in order to access the new cabinet. T-Mobile's concrete pad extension will be located with the existing chain link fence, therefore, no increase in the boundaries of the site will be necessary.

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

The proposed antennas will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The worst-case power density analysis measured at the base of the Tower indicates that T-Mobile's antennas will emit 4.1048% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

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

T-Mobile USA, Inc.

By: 

Thomas J. Regan

Brown Rudnick LLP

185 Asylum Street, CityPlace I

Hartford, CT 06103-3402


Email - tregan@brownrudnick.com

Phone - 860.509.6522 /Fax - 860.509.6501

Certificate of Service

This is to certify that on this 8th day of December, 2010, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

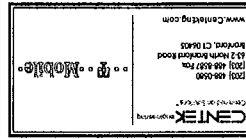
Town of Branford
First Selectman Anthony DaRos
1019 Main Street
Branford, CT 06405

By:  _____
Thomas J. Regan

40279520 v1 - 025064/0016

REV	DATE	BY	CHK'D BY	DESCRIPTION
B	10/27/10	CEJ	CHE	LEASE EXHIBIT - CLIENT REVIEW
A	10/27/10	CEJ	CHE	LEASE EXHIBIT - CLIENT REVIEW

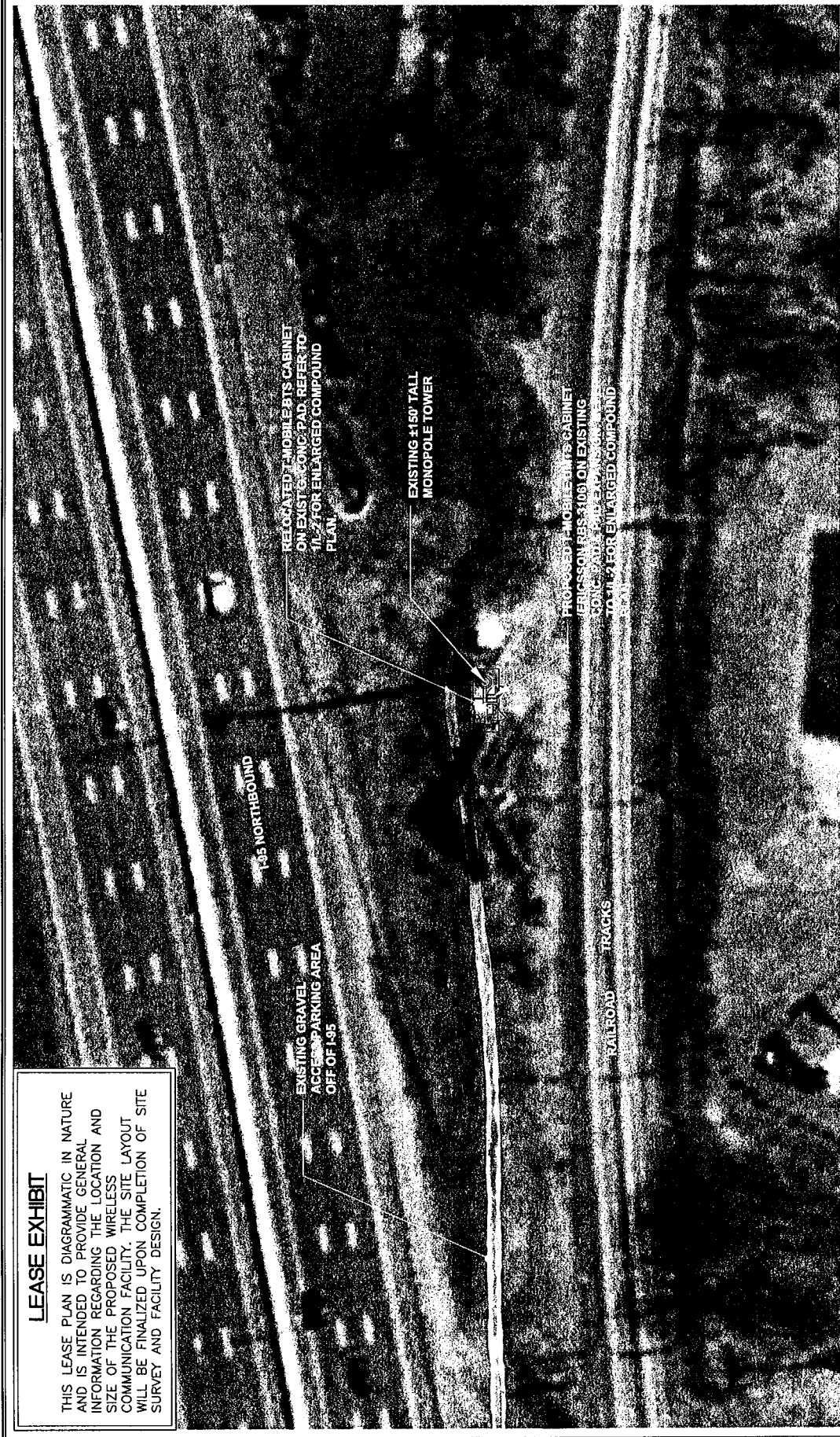
REVISIONS	DATE	BY	CHK'D BY	DESCRIPTION



T-MOBILE
CT11024B
 AMTRAK BRANFORD
 BRANFORD, CT
 HOLEY AVENUE & 135 MILF POST RD

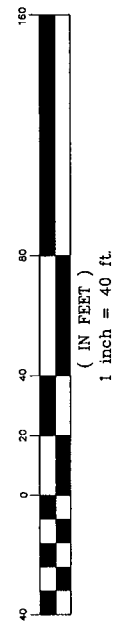
DATE	9/29/10
SCALE	AS SHOWN
JOB NO.	101110202

SHEET NO. **L-1**
 OF 2



LEASE EXHIBIT
 THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

1
 L-1
 SCALE: 1" = 40'
 APPROXIMATE NORTH



LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

REV.	DATE	BY	DESCRIPTION
1	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
2	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
3	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
4	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
5	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
6	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
7	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
8	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
9	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW
10	10/27/10	CT	LEASE EXHIBIT - CLIENT REVIEW

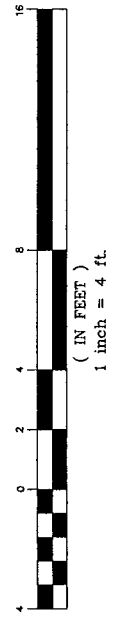
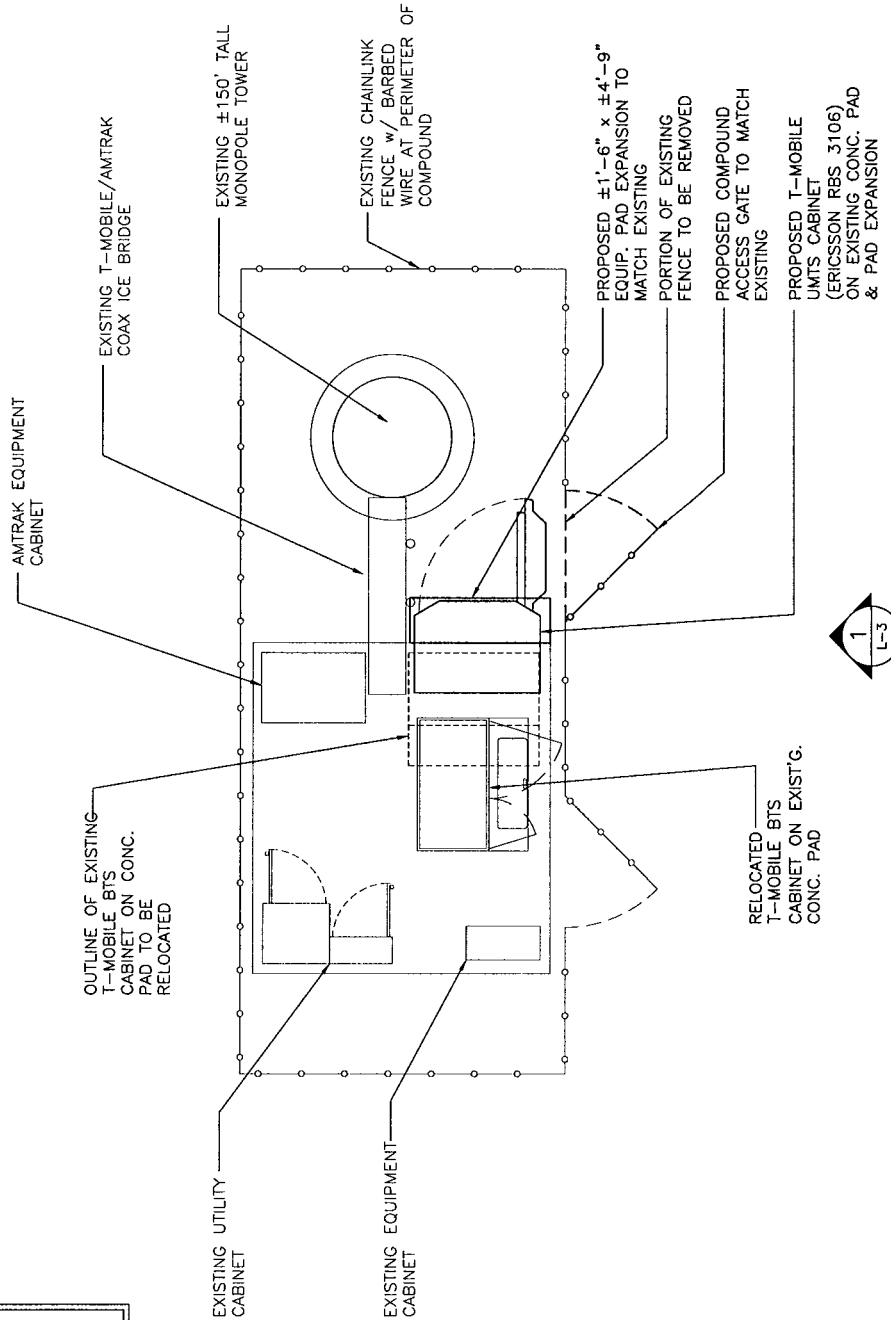
PROFESSIONAL ENGINEER SEAL

www.cantesting.com
 303 448 0000
 1000 10th Street
 Hartford, CT 06103
 • • • • • Mobile • • • • •

T-MOBILE
 CT11024B
 AMTRAK BRANFORD
 BRANFORD, CT
 HOBLEY AVENUE @ 166.166 POST #14

DATE: 9/29/10
 DRAWN BY: J. PERIN
 CHECKED BY: J. PERIN
 SHEET NO.: 10102402E

LEASE EXHIBIT
 SHEET NO. L-2



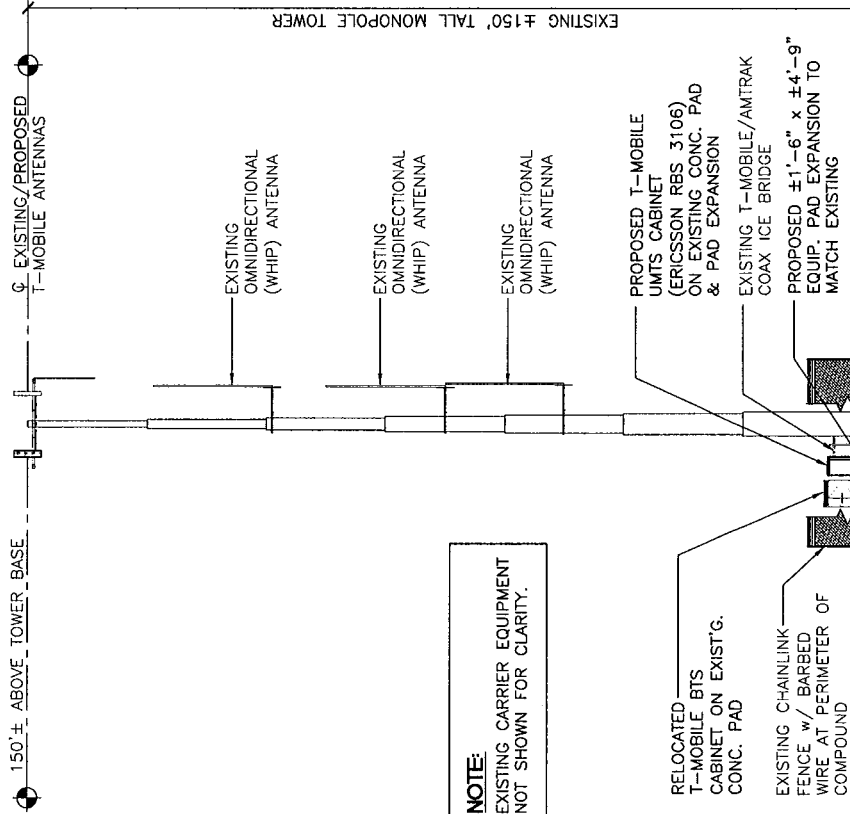
1
 L-2
COMPOUND PLAN
 SCALE: 1/4" = 1'-0"

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

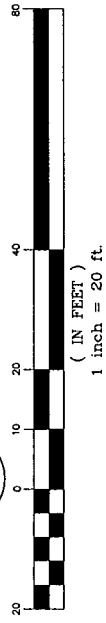
EQUIP. UPGRADE PROJECT SCOPE

EQUIPMENT TYPE	PROPOSED CHANGES
RADIO CABINET	<ul style="list-style-type: none"> (1) EXISTING BTS CABINET TO BE RELOCATED ON EXISTING CONC. EQUIPMENT PAD AS SHOWN HEREIN. INSTALL (1) ERICSSON RBS 3106 CABINET ON EXISTING AND PROPOSED CONC. EQUIPMENT PAD EXPANSION AS SHOWN HEREIN.
ANTENNAS/TMAS	<ul style="list-style-type: none"> EXISTING (3) EMS RR90-17-02DP PANEL ANTENNAS AND PLATFORM TO REMAIN. (3) RFS APX16DWV-16DWV-S PANEL ANTENNAS ARE PROPOSED TO BE INSTALLED ON PROPOSED MOUNT PIPES ON THE EXISTING PLATFORM. THE (6) EXISTING TMAS TO BE REPLACED WITH (3) PCS AND (3) AWS TMAS. TOTAL # OF TMAS TO REMAIN (6). TMAS TO BE INSTALLED ON EXISTING ANTENNA MOUNT PIPES BEHIND ANTENNAS. ORIENTATION OF EXISTING PLATFORM TO BE MODIFIED TO ACCOMMODATE PROPOSED AZIMUTH CHANGES. REFER TO FINAL T-MOBILE RF RADIO PLAN.
COAX CABLES	<ul style="list-style-type: none"> NO CHANGE IS PROPOSED FOR THE (6) EXISTING 1/4"Ø COAX CABLES ROUTED WITHIN THE EXISTING MONOPOLE TOWER. (6) ADDITIONAL 15/8"Ø COAX CABLES ARE PROPOSED TO BE ROUTED WITHIN THE EXISTING MONOPOLE TOWER. ROUTING TO BE COORDINATED WITH THE TOWER STRUCTURAL ANALYSIS TO BE PROVIDED.
COMPOUND LIMITS	<ul style="list-style-type: none"> NO CHANGE IS PROPOSED TO THE LIMITS OF THE EXISTING FENCED COMPOUND. AN ADDITIONAL ACCESS GATE (TO MATCH EXISTING) IS PROPOSED FOR SERVICE ACCESS TO THE PROPOSED UMTS CABINET



NOTE:
EXISTING CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.

1 SOUTH ELEVATION
SCALE: 1" = 20'



DESIGNED BY: CFC DRAWN BY: JAC CHECKED BY: CFC	PROJECT NO.: SHEET NO.: L-3 OF 3	LEASE EXHIBIT	AMTRAK BRANFORD CT11024B T-MOBILE	DATE: 9/29/10 SCALE: AS SHOWN JOB NO.: 10116202	HONOLY AVENUE @ 1.56 MILE POST 74 BRANFORD, CT AMTRAK BRANFORD CT11024B T-MOBILE	www.Centstek.com 830 203 468 6000 42 Rte 162 South Branford, CT 06405 1000	PROFESSIONAL ENGINEER SEAL [Blank Seal Area]	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>BY</th> <th>CHK'D BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10/27/10</td> <td>QEA</td> <td>CFC</td> <td>ISSUE EXHIBIT - CLIENT REVIEW</td> </tr> <tr> <td>2</td> <td>10/27/10</td> <td>QEA</td> <td>CFC</td> <td>ISSUE EXHIBIT - CLIENT REVIEW</td> </tr> </tbody> </table>	REV	DATE	BY	CHK'D BY	DESCRIPTION	1	10/27/10	QEA	CFC	ISSUE EXHIBIT - CLIENT REVIEW	2	10/27/10	QEA	CFC	ISSUE EXHIBIT - CLIENT REVIEW
REV	DATE	BY	CHK'D BY	DESCRIPTION																			
1	10/27/10	QEA	CFC	ISSUE EXHIBIT - CLIENT REVIEW																			
2	10/27/10	QEA	CFC	ISSUE EXHIBIT - CLIENT REVIEW																			

Structural Analysis Report

150-ft Existing PiROD Monopole

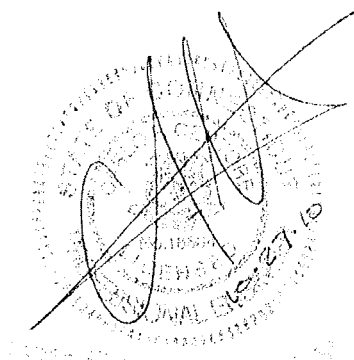
Proposed T-Mobile Antenna Upgrade

*T-Mobile Site Ref:
CT11024B – Branford*

*Off I-95 (Near Hosley Ave Overpass)
Branford, CT*

Centek Project No. 10116.CO2

Date: October 25, 2010



Prepared for:
T-Mobile Towers
4 Sylvan Way
Parsippany, NJ 07054

Table of Contents

SECTION 1 - REPORT

- INTRODUCTION.
- ANTENNA AND APPURTENANCE SUMMARY.
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS.
- ANALYSIS.
- TOWER LOADING.
- TOWER CAPACITY.
- FOUNDATION AND ANCHORS.
- CONCLUSIONS.

SECTION 2 – CONDITIONS & SOFTWARE

- STANDARD ENGINEERING CONDITIONS.
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM.

SECTION 3 – CALCULATIONS

- RISATower INPUT/OUTPUT SUMMARY.
- RISATower DETAILED OUTPUT.
- FLANGE BOLT AND PLATE ANALYSIS.
- MathCAD CAISSON FOUNDATION ANALYSIS.
- L-PILE CAISSON ANALYSIS.
- L-PILE LATERAL DEFLECTION vs. DEPTH.
- L-PILE BENDING MOMENT vs. DEPTH.
- L-PILE SHEAR FORCE vs. DEPTH.

SECTION 4 – REFERENCE MATERIALS

- T-MOBILE UMTS RFDS SHEET
- EQUIPMENT CUT SHEETS

Introduction

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

The host tower is a 150-ft AGL stacked pipe monopole originally designed and manufactured by PiROD job no. A-114856, dated June 27, 1998. The tower geometry and structure member sizes were obtained from the original tower design documents.

The existing tower is constructed of seven (7) stacked pipe sections connected by bolted flange plate connections. The pipe sections vary in width with a base section of 48" \varnothing and a top section of 12.75" \varnothing .

Antenna and Appurtenance information were taken from the aforementioned original tower design documents, a T-Mobile RF data sheet and visual verification conducted from grade by Centek Engineering personnel on September 3, 2010.

T-Mobile proposes the installation of three (3) panel antennas and six (6) TMAs. 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 and proposed loads considered in this analysis consist of the following:

- AMTRAK (Existing):
Antennas: One (1) 10-ft x 3-in Omni-directional whip antenna mounted on the existing T-Mobile platform with an elevation of 150-ft above grade level.
Coax Cables: One (1) 1-5/8" \varnothing coax cables running on the inside of the existing tower.
- T-MOBILE (Existing to Remain):
Antennas: Three (3) RR90-17-02DP and one (1) 1'x1' panel antennas on a PiROD 10-ft-6-in Low Profile Platform with a RAD center elevation of 150-ft above grade level.
Coax Cables: Six (6) 1-1/4" \varnothing and one (1) 1/2" \varnothing coax cables running on the inside of the existing tower.
- AMTRAK (Existing):
Antennas: One (1) PD220 whip antenna on a 4-ft-6-in Standoff with an elevation of 100-ft above grade level.
Coax Cables: One (1) 1-5/8" \varnothing coax cable running on the inside of the existing tower.

- **AMTRAK (Existing):**
Antennas: One (1) PD220 whip antenna on a 4-ft-6-in Standoff with an elevation of 70-ft above grade level.
Coax Cables: One (1) 1-5/8" Ø coax cable running on the inside of the existing tower.
- **AMTRAK (Existing):**
Antennas: One (1) PD220 whip antenna on a 4-ft-6-in Standoff with an elevation of 50-ft above grade level.
Coax Cables: One (1) 1-5/8" Ø coax cable running on the inside of the existing tower.
- **T-MOBILE (Existing to Remove):**
Antennas: Six (6) TMAs mounted on an existing PIROD 10-ft-6-in Low Profile Platform with a RAD center elevation of 150-ft above grade level.
- **T-MOBILE (Proposed):**
Antennas: Three (3) RFS APX16DWV-16DWVS-E-A20 panel antennas and six (6) TMAs mounted on an existing PIROD 10-ft-6-in Low Profile Platform with a RAD center elevation of 150-ft above grade level.
Coax Cables: Six (6) 1-5/8" Ø 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 existing coax cables to be installed within tower.

A n a l y s i s

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 90 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).

T o w e r L o a d i n g

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:	New Haven; $v = 85$ mph (fastest mile)	<i>[Section 16 of TIA/EIA-222-F-96]</i>
	Branford; $v = 110$ mph (3 second gust) equivalent to $v = 90$ mph (fastest mile) <i>Appendix K wind speed controls.</i>	<i>[Appendix K of the 2005 CT Building Code Supplement]</i>
Load Cases:	<u>Load Case 1</u> ; 90 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.	<i>[Section 2.3.16 of TIA/EIA-222-F-96]</i>
	<u>Load Case 2</u> ; 78 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 78 mph wind speed velocity represents 75% of the wind pressure generated by the 90 mph wind speed. This load case typically controls the design of lattice towers.	<i>[Section 2.3.16 of TIA/EIA-222-F-96]</i>
	<u>Load Case 3</u> ; Seismic – not checked	<i>Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type</i>

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 **79.4%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L1)	120.00'-150.00'	79.4%	PASS

Foundation and Anchors

The existing foundation consists of a 5.5-ft \varnothing x 28.0-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned PIROD design report; job no. A-114856, dated June 27, 1998. The base of the tower is connected to the foundation by means of (36) 1.00" \varnothing , ASTM A687 anchor bolts embedded approximately 5-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:

Base Reactions	Vector	Proposed Load (kips/ft-kips)
Base	Shear	12
	Axial	20
	Moment	1061

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	30.2%	PASS
	Lateral Deflection	0.37 in. ⁽¹⁾	PASS

(1) Lateral deflection typically limited to 1.0 in. for monopole tower structures.

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Flange Bolts (120' AGL)	Tension	77.2%	PASS
Flange Plate (120' AGL)	Bending	72.8%	PASS
Anchor Bolts	Tension	55.0%	PASS
Base Plate	Bending	67.0%	PASS

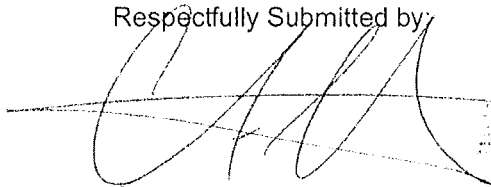
Conclusion

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

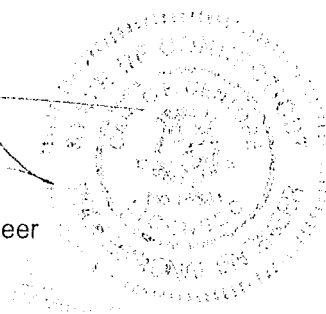
The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

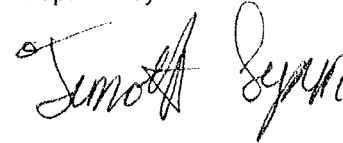
Respectfully Submitted by:



Carlo F. Centore, PE
Principal ~ Structural Engineer



Prepared by:



Timothy J. Lynn, EIT
Structural Engineer

Technical Memo

To: Transcend
From: Amir Uzzaman - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11024B
Date: December 1, 2010

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Monopole at 60 Hosley Avenue, Branford, 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), (1980.2-1984.8), (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 150 ft.
- 4) UMTS antenna center line height is 150 ft.
- 5) The maximum transmit power from any GSM sector is 1610.35 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2269.29 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
- 6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
- 7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) The average ground level of the studied area does not change significantly with respect to the transmitting location.

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

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Monopole at 60 Hosley Avenue, Branford, CT, is 0.04105 mW/cm². This value represents 4.105% 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

T-Mobile

Worst Case Power Density

Site: CT11024B
Site Address: 60 Hosley Avenue
Town: Branford
Tower Height: 150 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	RR90-17-02DP	Antenna Model	APX16DWV-16DWV
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	170 ft.	Cable Length	170 ft.
Antenna Height	150.0 ft.	Antenna Height	150.0 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	1.9720 dB	Total Cable Loss	1.9720 dB
Total Attenuation	6.4720 dB	Total Attenuation	3.4720 dB
Total EIRP per Channel (In Watts)	53.04 dBm 201.29 W	Total EIRP per Channel (In Watts)	60.55 dBm 1134.64 W
Total EIRP per Sector (In Watts)	62.07 dBm 1610.35 W	Total EIRP per Sector (In Watts)	63.56 dBm 2269.29 W
nsg	10.0280	nsg	14.5280

Power Density (S) = 0.017038 mW/cm² **Power Density (S) = 0.024010 mW/cm²**
T-Mobile Worst Case % MPE = 4.1048%

Equation Used :

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

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

Co-Location Total	
Carrier	% of Standard
Verizon	
Verizon	
MetroPCS	
Nextel	
Sprint	
Town	
Other Antenna Systems	
Total Excluding T-Mobile	0.0000 %
T-Mobile	4.1048
Total % MPE for Site	4.1048%