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

January 30, 2013

Rick Woods
SBA Communications Corporation
33 Boston Post Road West
Suite 320
Marlborough, MA 01752

RE: **EM-T-MOBILE-077-121227** – T-Mobile Northeast LLC notice of intent to modify an existing telecommunications facility located at 640 Hilliard Street, Manchester, Connecticut.

Dear Mr. Woods:

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 coax lines and accessory equipment shall be installed in accordance with the recommendations made in the Structural Analysis prepared by FDH Engineering dated December 12, 2012 and stamped by Christopher Murphy;
- Not more than 45 days following completion of the antenna installation, T-Mobile shall provide documentation certified by a professional engineer that its installation complied with the recommendations of the structural analysis;
- 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 more 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 21, 2012. 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.

CSC
CONNECTICUT SITING COUNCIL

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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/jb

c: The Honorable Leo V. Diana, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester

EM-T-MOBILE-077-121227

December 21, 2012

ORIGINAL

David Martin and
Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RECEIVED
DEC 27 2012
CONNECTICUT
SITING COUNCIL

RE: Notice of Exempt Modification
640 Hilliard Street
Manchester, CT 06040
N 41° 47' 4.2"
W 72° 33' 2.901"

Dear Mr. Martin and Members of the Siting Council:

On behalf of T-Mobile Northeast LLC, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 640 Hilliard Street Manchester, CT.

The 640 Hilliard Street facility consists of a 150' MONOPOLE Tower owned and operated by SBA Communications. In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile plans to modify the equipment configurations at many of its existing cell 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 chief elected official of the municipality in which the affected cell site is located.

As part of T-Mobile's Modernization modification project, T-Mobile desires to upgrade their equipment to meet the new standards of 4G technology. The new antennas and associated equipment will allow customers to download files and browse the internet at a high rate of speed while also allowing their phones to be compatible with the latest 4G technology.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in T-Mobile's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna and equipment configuration along with the required fee of $625.

The changes to the facility do not constitute modifications 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 or altered. 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 overall height of the structure will be unaffected.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than the new equipment cabinets.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. The changes in radio frequency power density 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.

For the foregoing reasons, SBA Communications on behalf of T-Mobile Northeast LLC, respectfully submits that he proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to cal me at (508) 614-0389 with any questions you may have concerning this matter.

Thank you,

Rick Woods
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-1691 x 319 + T
508-251-1755 + F
508-614-0389 + C
rwoods@sbasite.com

T-Mobile Northeast LLC

Equipment Modification

640 Hilliard Street Manchester, CT
Site number CTHA071D

Tower Owner: SBA Communications Corporation

Equipment Configuration: MONOPOLE Tower

Current and/or approved:
Nine (9) GSM/UMTS Antennas @ 148'
Eighteen (18) lines of 1-5/8" coax
Six (6) TMAs
Two (2) equipment cabinets

Planned Modifications:
Replacing Nine (9) existing antennas with Six (6) new antennas
Removing Six (6) TMAs and install Three (3) new TMAs
Removing Six (6) lines of 1-5/8" coax
Modifying existing equipment cabinets

Structural Information:

The attached structural analysis demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed modifications.

Power Density:

The anticipated Maximum Composite contributions from the T-Mobile facility are 0.396% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 5.976% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.396%
Clearwire	1.360%
Metro PCS	4.220%
Total Site MPE %	**5.976%**

December 21, 2012

Scott Shanley
General Manager
Town of Manchester
41 Center St.
Manchester, CT 06040

RE: Telecommunications Facility- 640 Hilliard Street Manchester, CT 06040

Dear Mr. Shanley,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile Northeast LLC will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (508) 614-0389.

Thank you,

Rick Woods
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-1691 x 319 + T
508-251-1755 + F
508-614-0389 + C
rwoods@sbasite.com

EBI Consulting
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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTHA071D

CT071 / Optasite Hilliardville
640 Hilliard Street
Manchester, CT 06041

December 14, 2012

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

December 14, 2012

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Re: Emissions Values for Site: **CTHA071D - CT071 / Optasite Hilliardville**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 640 Hilliard Street, Manchester, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm2). The general population exposure limit for the cellular band is 567 μW/cm2, and the general population exposure limit for the PCS band is 1000 μW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 640 Hilliard Street, Manchester, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation 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.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

7) The antenna mounting height centerline of the proposed antennas is **147 feet** above ground level (AGL)
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CTHA071D - CT071 / Optasite Hilliardville
Site Addresss	640 Hilliard Street, Manchester, CT 06041
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	147	141	None	0	0	24.163022	0.436937	0.04369%
1B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS/LTE	40	4	160	-3.95	147	141	1-5/8"	1.2	0	48.878738	0.883869	0.08839%
															Sector total Power Density Value:		0.132%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	147	141	None	0	0	24.163022	0.436937	0.04369%
1B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS/LTE	40	4	160	-3.95	147	141	1-5/8"	1.2	0	48.878738	0.883869	0.08839%
															Sector total Power Density Value:		0.132%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	147	141	None	0	0	24.163022	0.436937	0.04369%
1B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS/LTE	40	4	160	-3.95	147	141	1-5/8"	1.2	0	48.878738	0.883869	0.08839%
															Sector total Power Density Value:		0.132%

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.396%
Clearwire	1.360%
Metro PCS	4.220%
Total Site MPE %	**5.976%**

EBI Consulting
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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public exposure to RF Emissions.

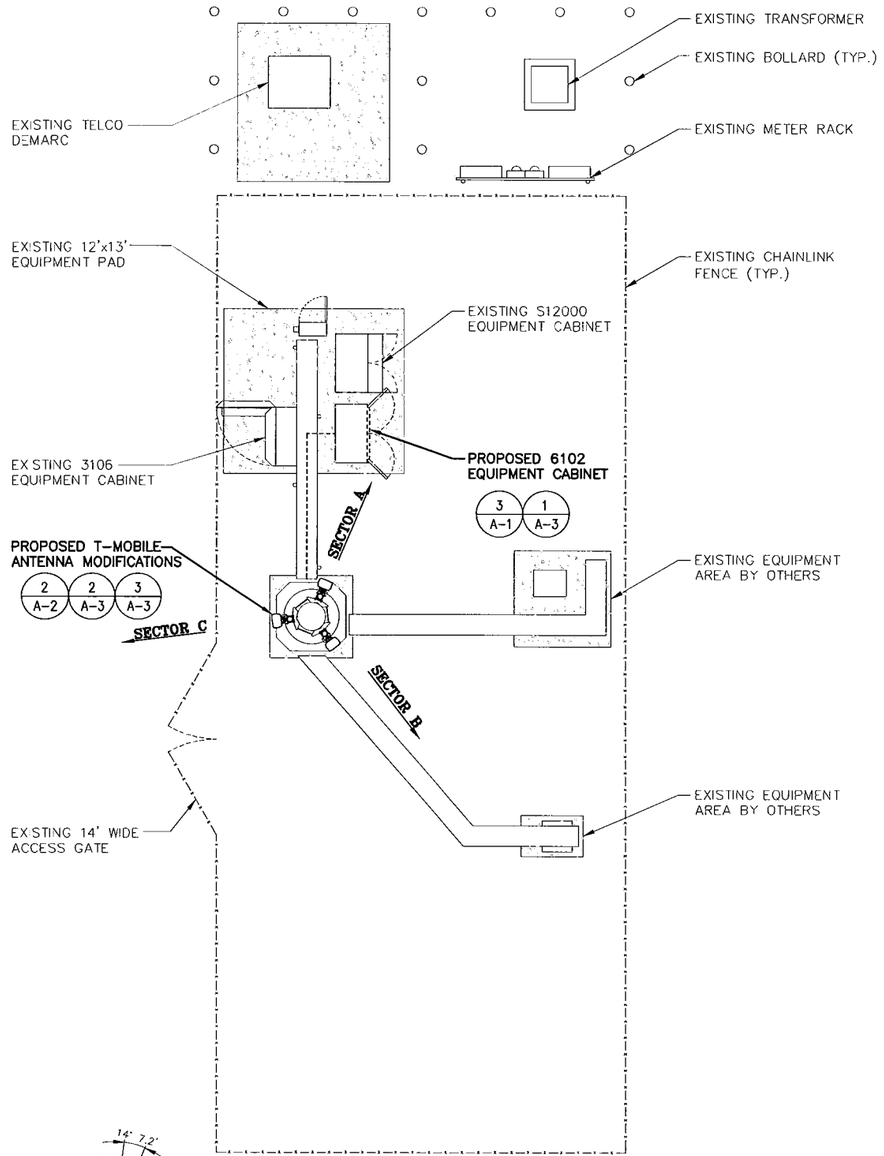
The anticipated Maximum Composite contributions from the T-Mobile facility are **0.396% (0.132% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **5.976%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government

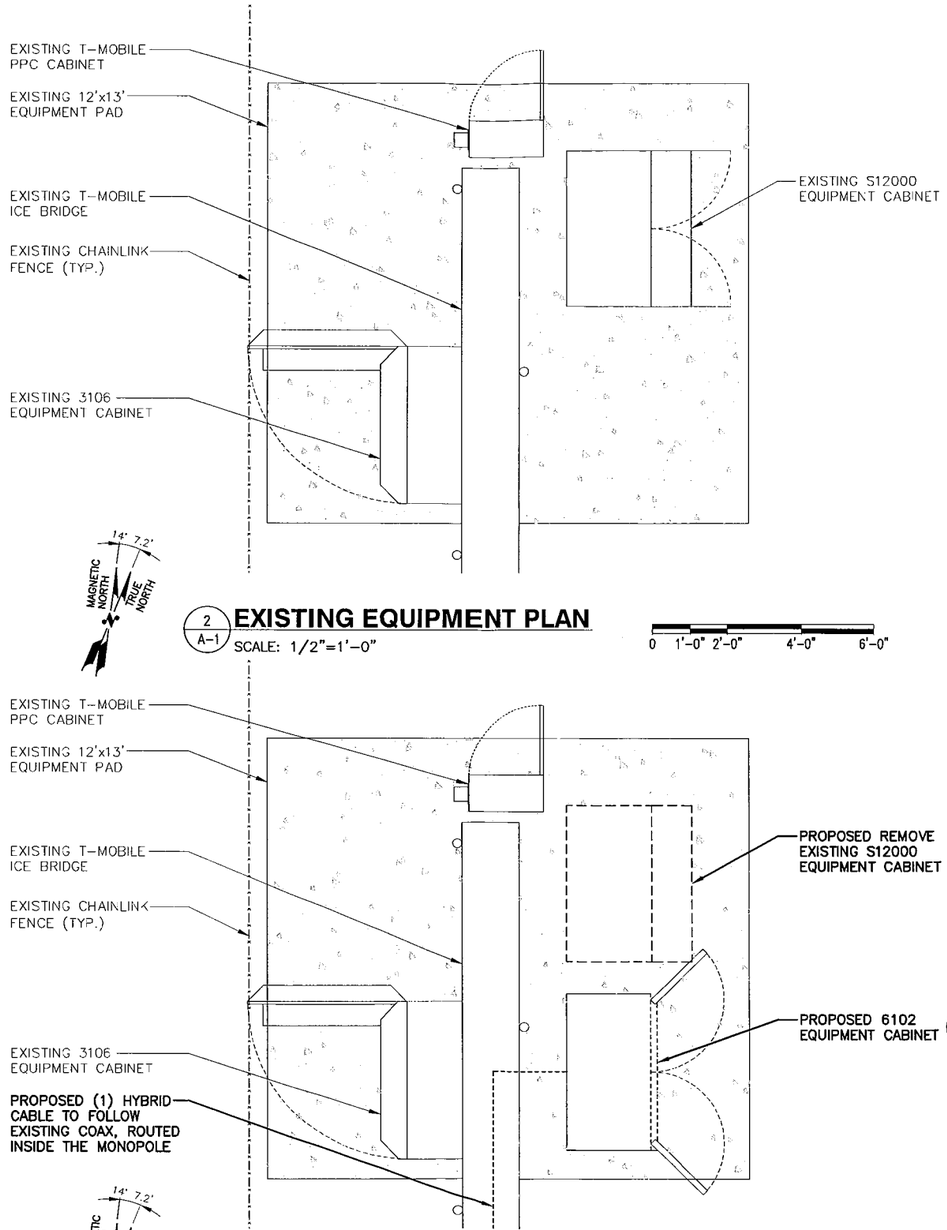
Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803



1 A-1 **COMPOUND PLAN**
SCALE: 3/16"=1'-0"

0 2'-8" 5'-4" 8'-0" 16'-0"



2 A-1 **EXISTING EQUIPMENT PLAN**
SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

3 A-1 **PROPOSED EQUIPMENT PLAN**
SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SBA
SBA COMMUNICATIONS CORP.
5900 BROKEN SOUND PARKWAY
BOCA RATON, FL 33487-2797
TEL: (561) 226-9523
FAX: (561) 226-3572

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
(860) 648-1116

SITE NUMBER: CTHA071D
SITE NAME: SBA MIDDLE TURNPIKE
640 HILLIARD ST
MANCHESTER, CT 06040
HARTFORD COUNTY

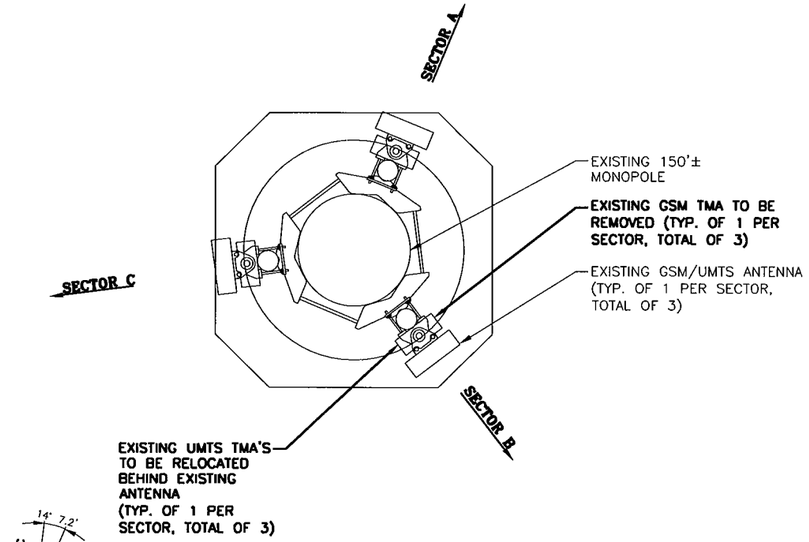
NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/05/12	ISSUED FOR PERMIT	CM	RP	DPH
1	11/28/12	ISSUED FOR REVIEW	PN	RP	DPH
0					

SCALE: AS SHOWN | DESIGNED BY: PN | DRAWN BY: PN

T-MOBILE

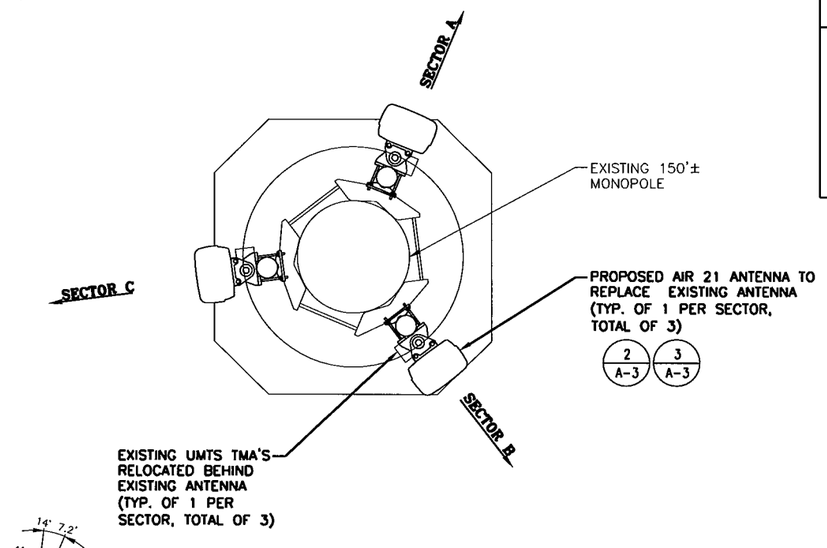
COMPOUND & EQUIPMENT PLAN

JOB NUMBER	DRAWING NUMBER	REV
CTHA071D	A-1	1



1 A-2 EXISTING ANTENNA PLAN

SCALE: N.T.S.



2 A-2 PROPOSED ANTENNA PLAN

SCALE: N.T.S.

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY FDH ENGINEERING, INC. AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION

EXISTING ANTENNA SCHEDULE

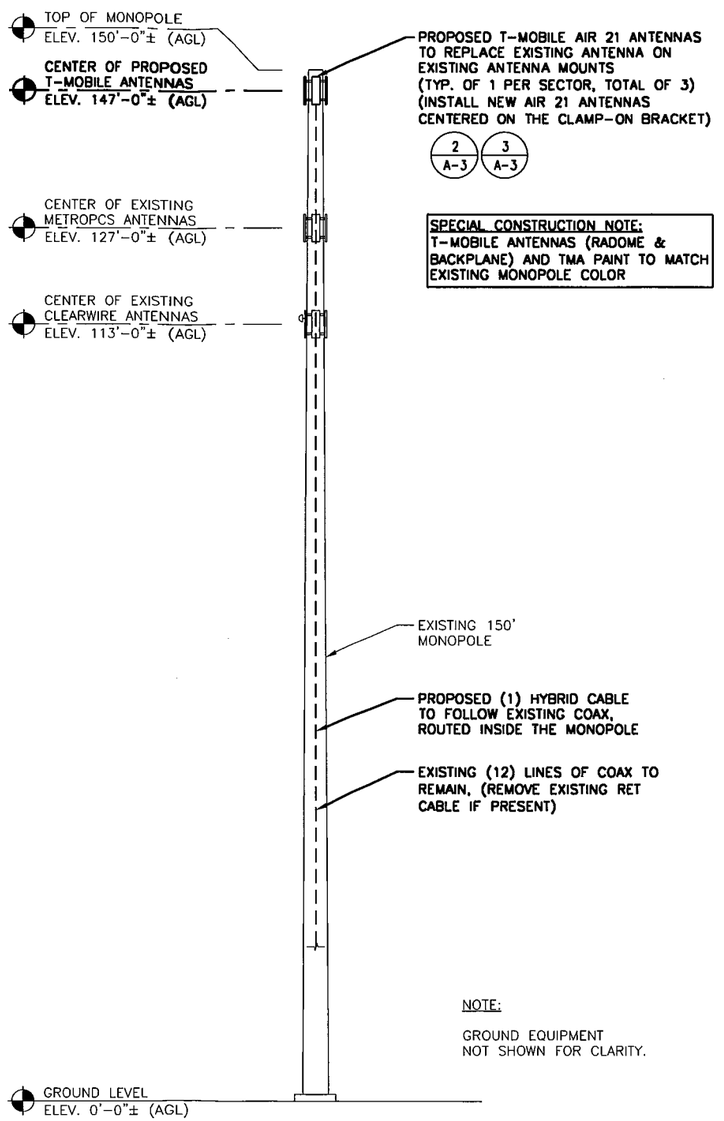
SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	RFS	APX16PV-16PVL	53x12.9x3.15
BETA:	RFS	APX16PV-16PVL	53x12.9x3.15
GAMMA:	RFS	APX16PV-16PVL	53x12.9x3.15

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	ERICSSON	AIR21 B2A/B4P	56x12x8
BETA:	ERICSSON	AIR21 B2A/B4P	56x12x8
GAMMA:	ERICSSON	AIR21 B2A/B4P	56x12x8

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION.



3 A-2 TOWER ELEVATION

SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 24178 — LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
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FAX:(561) 226-3572

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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(860) 648-1116

SITE NUMBER: CTHA071D
SITE NAME: SBA MIDDLE TURNPIKE
640 HILLIARD ST
MANCHESTER, CT 06040
HARTFORD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/05/12	ISSUED FOR PERMIT	CM	RP	DPH
1	11/28/12	ISSUED FOR REVIEW	PN	RP	DPH
0					

SCALE: AS SHOWN | DESIGNED BY: PN | DRAWN BY: PN

T-MOBILE

ANTENNA LAYOUT AND ELEVATION

JOB NUMBER	DRAWING NUMBER	REV
CTHA071D	A-2	1

Structural Analysis for SBA Network Services, Inc.

149' Monopole Tower

SBA Site Name: Middle Turnpike
SBA Site ID: CT13063-A-00
T-Mobile Site ID: CTHA071D

FDH Project Number 12-11873E S1

Analysis Results

Tower Components	63.7%	Sufficient
Foundation	72.3%	Sufficient

Prepared By:

Heather W. Jones

Heather W. Jones, EI
Project Engineer

Reviewed By:

Christopher M. Murphy

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

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com

December 12, 2012

Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas and 2005 Connecticut State Building Code

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural 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 Standard for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G* and *2005 Connecticut State Building Code (2005 CSBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- Sabre Towers & Poles (Job No. 08-01015 Revision A) Structural Design Report dated February 15, 2008
- JGI Eastern, Inc. (Project No. J2085111) Geotechnical Evaluation dated February 7, 2008
- FDH, Inc. (Job No. 08-07128T) TIA Inspection Report dated October 12, 2008
- SBA Network Services, Inc.

The *basic design wind speed* per the *ANSI/TIA-222-G* standard and *2005 CSBC* is 100 mph without ice and 50 mph with 1" radial ice. Ice is considered to increase in thickness with height. Furthermore, this structure was analyzed as a Class II structure in Exposure Category B with a topographical factor of 1.

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* standard and *2005 CSBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Sabre Communication Corp. Job No. 08-01015 Revision A), the foundation should have the necessary capacity to support both the proposed and existing 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* standard and *2005 CSBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the pole's shaft.
2. The proposed TMAs should be installed directly behind the proposed panel 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 the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
148.4	(6) Andrew RR90-17-XXDP (3) Andrew TMZXXX-6516-R2M (3) Andrew ETW190VS12UB TMAs (3) RFS ATMAA1412D-1A20 TMAs	(18) 1-5/8" (1) 1/4"	T-Mobile	147	(1) Future Platform
127	(3) RFS APXV18-206517S-C	(6) 1-5/8"	Pocket	127	Flush Mount
117	(3) Argus LLPX310R (3) BTSs (1) Andrew VHLP2-11 Dish (1) Andrew VHLP2.5-11 Dish	(3) 1/4" (2) 1/2" (3) 5/8" (1) 5/16"	Clearwire	117	Flush Mount

1. Coax installed inside the pole's shaft unless otherwise noted.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
147	(3) Ericsson AIR B2A/B4P (3) Ericsson KRY 112 144 TMAs	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	147	Flush Mount

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Flange Plate	60 ksi
Flange Bolts	Fu=120 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

Table 3 displays the summary of 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. **Table 5** displays the maximum antenna rotations at service wind speeds.

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	18.8	Pass
	109	Flange Bolts	(8) 1" ø w/ B.C.=32.375"	39.5	Pass
	109	Flange Plate	PL 36.625" ø x 0.75" Thick	63.7	Pass
L2	109 - 98	Pole	TP30.58x29.16x0.1875	24.4	Pass
L3	98 - 48.5	Pole	TP36.59x29.6886x0.25	43.1	Pass
L4	48.5 - 0	Pole	TP42.35x35.4773x0.375	41.0	Pass
		Anchor Bolts	(12) 2.25" ø w/ B.C.=48.75"	40.8	Pass
		Base Plate	PL 48" Square x 2.75" Thick	31.8	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis *(ANSI/TIA-222-G)*	Original Design *(ANSI/TIA-222-G)*
Axial	24 k	37 k
Shear	14 k	20 k
Moment	1,241 k-ft	1,716 k-ft

Table 5 – Maximum Antenna Rotations at Service Wind Speed

Centerline Elevation	Dish	Tilt (deg)*	Twist (deg)*
117	(1) Andrew VHLP2-11 Dish (1) Andrew VHLP2.5-11 Dish	0.6150	0.0005

*Allowable Tilt and Twist to be reviewed by others.

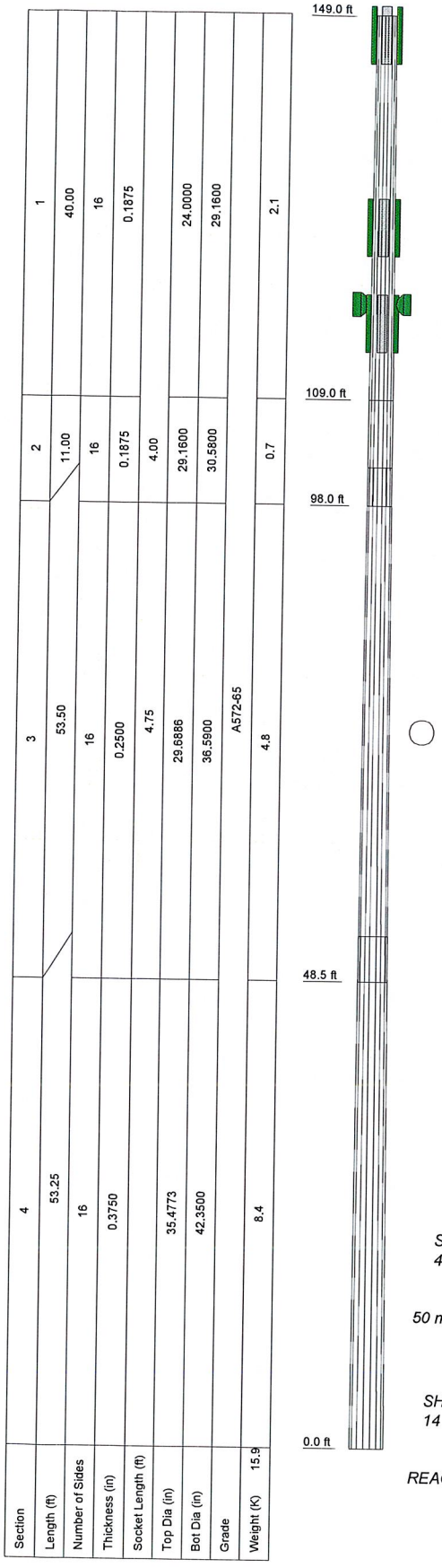
GENERAL COMMENTS

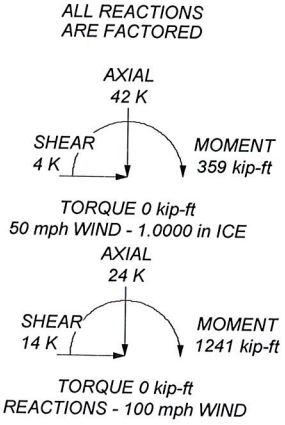
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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.

APPENDIX





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) Flush Mount Clamps	147	(3) Flush Mount Clamps	127
AIR B2A/B4P w/Mount Pipe	147	LLPX310R w/Mount Pipe	117
AIR B2A/B4P w/Mount Pipe	147	LLPX310R w/Mount Pipe	117
AIR B2A/B4P w/Mount Pipe	147	LLPX310R w/Mount Pipe	117
KRY 112 144	147	BTS	117
KRY 112 144	147	BTS	117
KRY 112 144	147	BTS	117
APXV18-206517S-C w/ mount pipe	127	(3) Flush Mount Clamps	117
APXV18-206517S-C w/ mount pipe	127	VHLP2-11	117
APXV18-206517S-C w/ mount pipe	127	VHLP2.5-11	117

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 Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

FDH Engineering, Inc.
6521 Meridian Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031
Tower Analysis

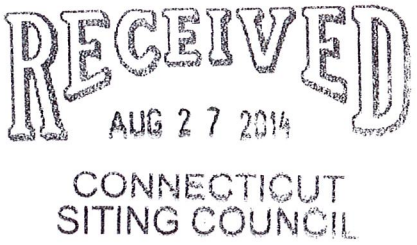
Job: Middle Turnpike, CT13063-A-00			
Project: 12-11873E S1			
Client: SBA Network Services, Inc.	Drawn by: Heather Jones	App'd:	
Code: TIA-222-G	Date: 12/12/12	Scale: NTS	
Path:		Dwg No. E-1	

COHEN and WOLF P.C.
ATTORNEYS AT LAW

RACHEL A. SCHWARTZMAN

Please Reply To: Bridgeport
Writer's Direct Dial: (203) 337-4110
E-Mail: rschwartzman@cohenandwolf.com

August 26, 2014



Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06501

Re: EM-T-MOBILE-077-121227
T-Mobile Site ID CTHA071D
640 Hilliard Street, Manchester, CT
Notice of Compliance with Conditions and Construction Completion

Dear Attorney Bachman:

The Connecticut Siting Council ("Council") acknowledged the above referenced T-Mobile Northeast LLC ("T-Mobile") notice of exempt modification on January 30, 2014.

The Council imposed the following condition in its acknowledgment:

- The proposed coax lines and accessory equipment shall be installed in accordance with the recommendation made in the Structural Analysis Report prepared by FDH Engineering dated December 12, 2012 and stamped by Christopher Murphy;

- Not more than 45 days following completion of the antenna installation, T-Mobile shall provide documentation certified by a professional engineer that its installation complied with the recommendation of the structural analysis.

T-Mobile has complied with each of these conditions as evidenced by the PE Close Out Letter, dated August 25, 2014, attached hereto.

In addition, T-Mobile hereby notifies the Council that construction of the acknowledged modifications were complete as of March 6, 2014.

Please don't hesitate to contact me with any questions.

Sincerely,

Rachel Schwartzman

Rachel A. Schwartzman, Esq.

cc: Samuel Simons, T-Mobile
Mark Richard, T-Mobile
Alex Giannaras, HPC Wireless
Julie Kohler, Esq.

Hudson Design Group LLC

August 25, 2014

Sam Simons
Engineering Development - Connecticut
T-Mobile
35 Griffin Road South
Bloomfield, CT 06002
sam.simons@t-mobile.com

RE: PE Close Out Letter
T-Mobile Site ID # CTHA071D

Dear Mr. Simons:

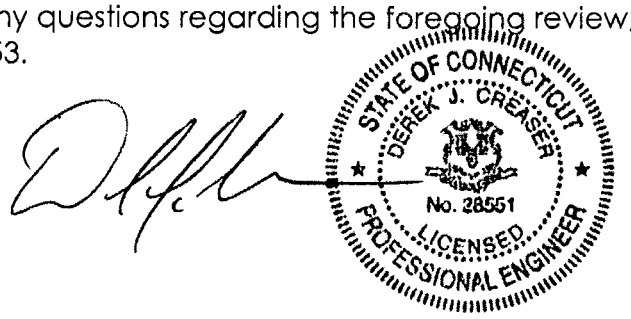
Hudson Design Group, LLC (HDG)has completed its post-construction review of the above-referenced site to determine whether T-Mobile complied with conditions imposed by the Connecticut Siting Council's (the "Council") acknowledgment letter, dated 1-30-13 ("the Acknowledgment Letter"). Our compliance review included the following: the Acknowledgment Letter, the approved tower structural analysis report by FDH Engineering, dated 12-12-12 (the "Structural Analysis"), and the approved design plans by Hudson Design Group LLC, dated 12-05-12.

On behalf of T-Mobile, based on my review of the information, I, Derek J. Creaser, licensed professional engineer number 28551, certify that to the best of my knowledge, T-Mobile work complied with the recommendations of the approved Structural Analysis. Specifically, as required by the Acknowledgment Letter, T-Mobile's work complied with the following structural conditions imposed by the Council:

** The coax lines and accessory equipment should be installed in accordance with the recommendations made in the Structural Analysis Report prepared by FDH Engineering, dated 12-12-12 and stamped by Christopher Murphy.*

Should you have any questions regarding the foregoing review, please contact me directly at 978-557-5553.

Very truly yours,



Derek J. Creaser, P.E.
Sr. Project Manager
Hudson Design Group LLC