January 13, 2014

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

RE: Notice of Exempt Modification
46 Meadow Road
Clinton, CT 06413
N 41° 16' 30.74"
W 72° 29' 51.76"

Dear Mr. Martin and Members of the Siting Council:

On behalf of T-Mobile, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 46 Meadow Road, Clinton, CT

The 46 Meadow Road facility consists of a 195' Self Support Tower owned and operated by SBA Towers, LLC. 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 project, T-Mobile desires to upgrade their equipment to meet the new standards of 4G technology. The new 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 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, 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 call 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

Equipment Modification

46 Meadow Road, Clinton, CT 06413
Site number CT11429A

Tower Owner: SBA Towers, LLC

Equipment Configuration: Self Support Tower

Current and/or approved:

- (9) EMS RR90-17-02DP
- (3) RFS APX 16DWV-16DWV-S
- (3) Twin PCS TMAs
- (3) Twin AWS TMAs

Planned Modifications:

- (3) Ericsson AIR B2A B4P
- (3) Ericsson AIR B4A B2P
- (3) Ericsson KRY 112 144-1 Double TMAs

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 .300% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 29.110% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.300%
AT&T	5.960%
Verizon Wireless	19.400%
Sprint	3.450%
Total Site MPE %	29.110%

January 13, 2014

William W. Fritz, First Selectman
Town of Clinton
Town Hall
54 East Main Street
Clinton, CA 06413

RE: Telecommunications Facility @ 46 Meadow Road, Clinton, CT

Dear Mr. Fritz,

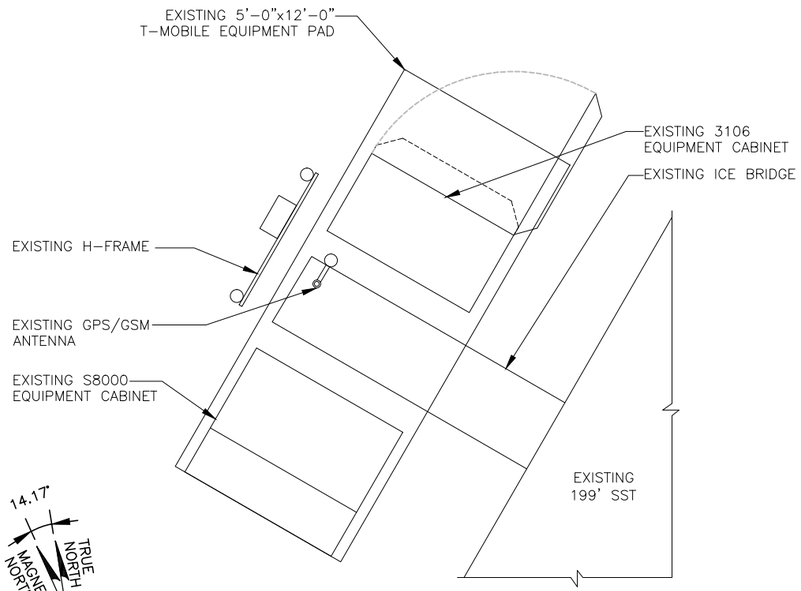
In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

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.

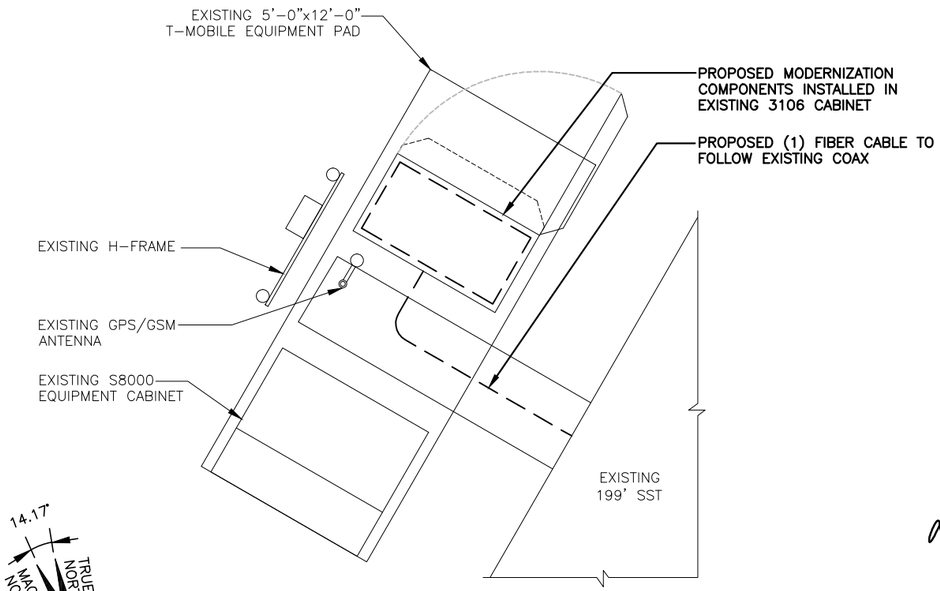
Thank you,

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



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

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



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

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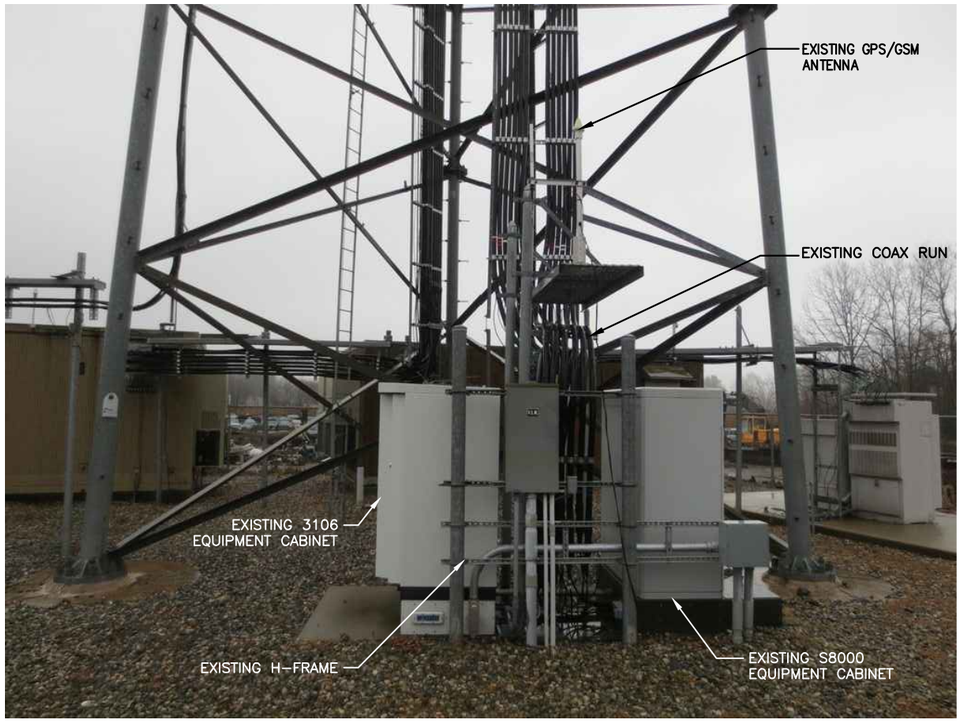
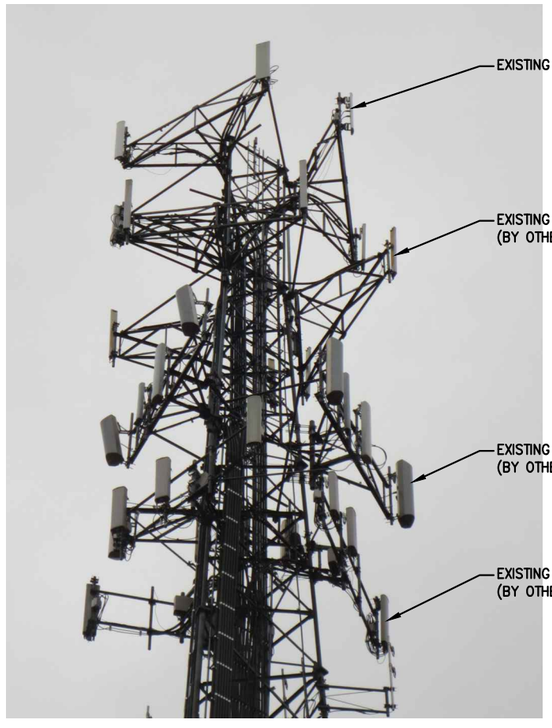


3 A-2 **EXISTING EQUIPMENT PHOTO DETAIL**
SCALE: N.T.S



4 A-2 **EXISTING ANTENNA PHOTO DETAIL**
SCALE: N.T.S

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

SBA COMMUNICATIONS CORP.
33 BOSTON POST ROAD W
MARLBOROUGH, MA 01752
TEL: (508) 251-1691
FAX:(508) 251-1755

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

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

Daniel P. Hamm

APPROVALS

CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING/SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE
PROJECT NO:	CT11429A
DRAWN BY:	GC
CHECKED BY:	RP

2	12/30/13	FOR CONSTRUCTION
1	12/09/13	RE-ISSUED FOR REVIEW
0	12/04/13	ISSUED FOR REVIEW

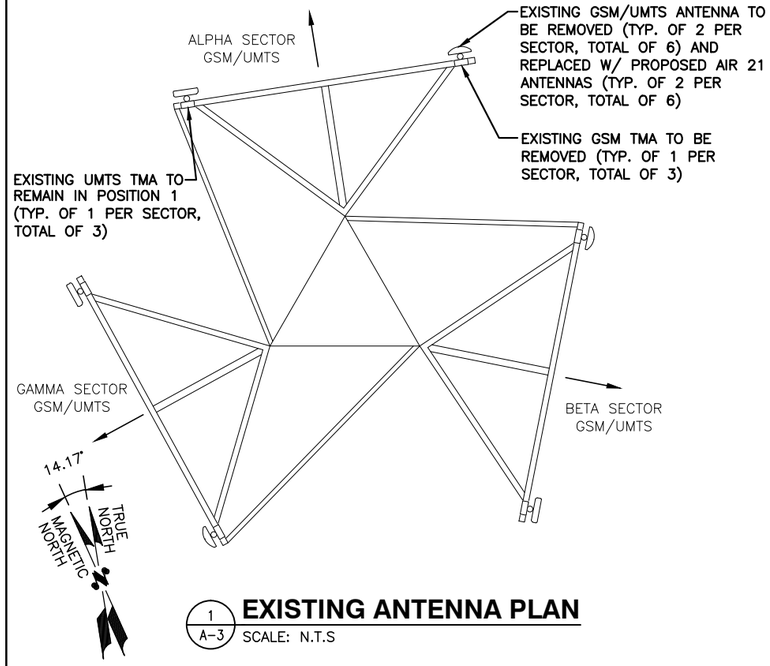
SITE NUMBER: CT11429A
SITE NAME:
CLINTON/ROUTE 1
46 MEADOW ROAD
CLINTON, CT 06413
NEW LONDON COUNTY

SHEET TITLE

EXISTING & PROPOSED
EQUIPMENT PLANS

SHEET NUMBER

A-2



1/A-3 EXISTING ANTENNA PLAN

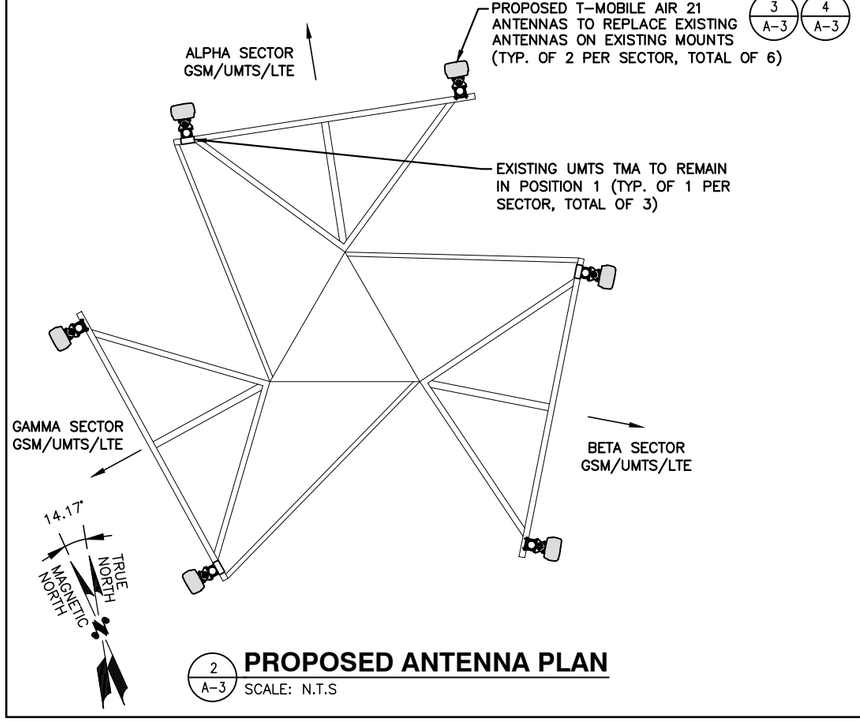
SCALE: N.T.S

NOTE:

GENERAL CONTRACTOR TO REFER TO STRUCTURAL ANALYSIS BY:FDH ENGINEERING, INC. DATED:DECEMBER 27, 2013, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT

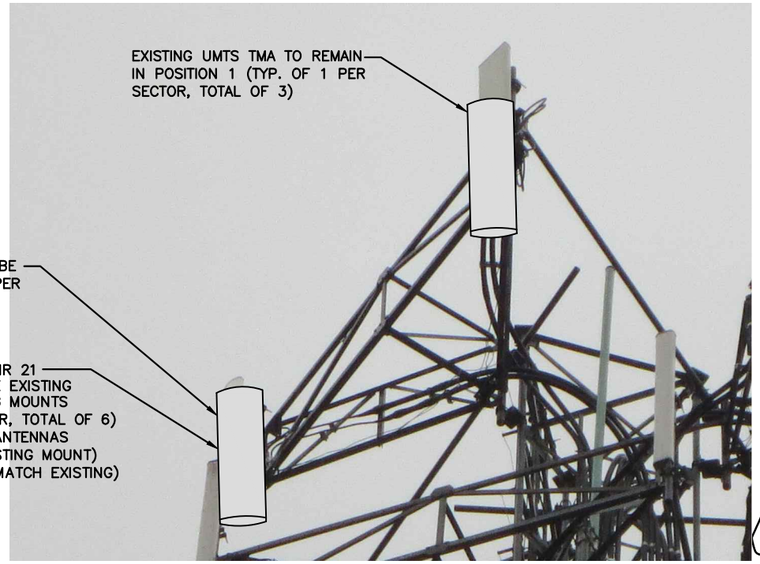
NOTE:

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



2/A-3 PROPOSED ANTENNA PLAN

SCALE: N.T.S



4/A-3 PROPOSED ANTENNA PHOTO DETAIL

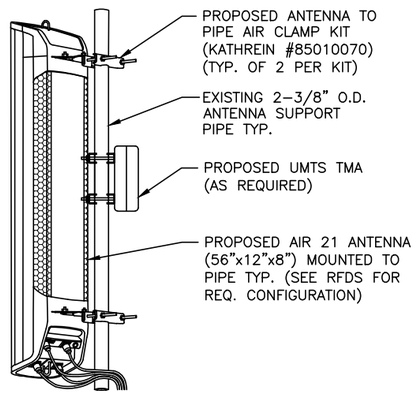
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	RFS	APX16DWV_16DWV	55.9x13x3.15
	EMS	RR90-17-02DP	56x8x2.8
BETA:	RFS	APX16DWV_16DWV	55.9x13x3.15
	EMS	RR90-17-02DP	56x8x2.8
GAMMA:	RFS	APX16DWV_16DWV	55.9x13x3.15
	EMS	RR90-17-02DP	56x8x2.8

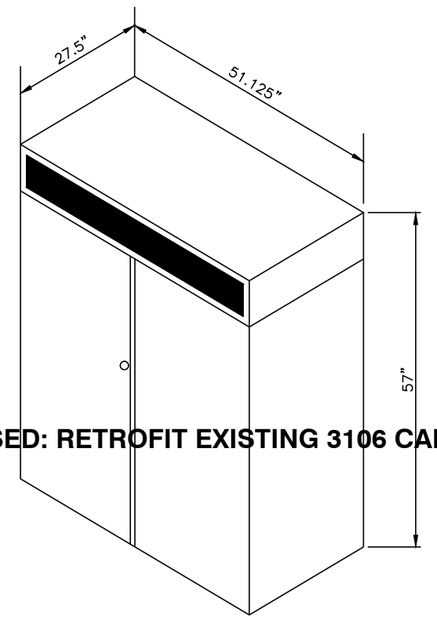
PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	ERICSSON	AIR21 B2A/B4P	56x12x8
	ERICSSON	AIR21 B4A/B2P	56x12x8
BETA:	ERICSSON	AIR21 B2A/B4P	56x12x8
	ERICSSON	AIR21 B4A/B2P	56x12x8
GAMMA:	ERICSSON	AIR21 B2A/B4P	56x12x8
	ERICSSON	AIR21 B4A/B2P	56x12x8



3/A-3 AIR21 ANTENNA MOUNT (TYP.)

SCALE: N.T.S.



NOT USED: RETROFIT EXISTING 3106 CABINET

5/A-3 PROPOSED MODERNIZATION CABINET (TYP.)

SCALE: N.T.S.

T-MOBILE NORTHEAST LLC

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SITE NUMBER: CT11429A
SITE NAME:
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46 MEADOW ROAD
CLINTON, CT 06413
NEW LONDON COUNTY

SHEET TITLE

ANTENNA PLAN & DETAILS

SHEET NUMBER

A-3

Structural Analysis for SBA Network Services, Inc.

195' Self-Support Tower

SBA Site Name: Clinton 4
SBA Site ID: CT01879-S
T-Mobile Site ID: CT11429A

FDH Project Number 13THU71400

Analysis Results

Tower Components	99.5%	Sufficient
Foundation	95.7%	Sufficient

Prepared By:

Christopher B. Stryffeler, EI
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director of Structrural Engineering
CT PE License No. 23247

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

12-27-2013

December 27, 2013

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut State Building Code

TABLE OF CONTENTS

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Clinton, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut State Building Code (CSBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, the member sizes, and foundation dimensions was obtained from:

- Sabre Communications Corporation (Job No. 00-10101) Structural Design Report dated November 19, 1999
- Jaworski Geotech, Inc. (Job No. 99500G) Field Soil Screening dated December 13, 1999
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CSBC* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 192.5 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 CSBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Sabre Job No. 00-10101), the foundations 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 *TIA/EIA-222-F* standards and the *2005 CSBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The feed lines must be installed as shown in **Figure 1**.
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 the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
192.5	(9) EMS RR90-17-02DP (3) RFS APX16DWV-16DWV-S (3) Twin PCS TMAs (3) Twin AWS TMAs	(12) 1-5/8"	T-Mobile	192	(3) T-Frames
191.8	(1) Celwave PD1151 Omni	(1) 7/8"	Town of Clinton	184	(1) Standoff
182	(3) RFS APXVSPP18-C-A20 (3) ALU 1900 MHZ RRUs (3) ALU 800 MHZ RRUs (3) ALU 800 MHZ Filters (4) RFS ACU-A20-N RETs	(3) 1-1/4" Fiber	Sprint	182	(3) T-Frames
162	(3) Antel BXA-70063/6CF (4) Antel LPA-80063/4CF (2) Antel BXA-171063/8BF (1) Antel BXA-171063/12CF (2) Antel LPA-80063/6CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	162	(3) T-Frames
152	(9) KMW AM-X-CD-14-65-00T (3) Powerwave 7770 (6) Powerwave TT19-08BP111-001 TMAs (3) Powerwave LGP13519 Diplexers (3) CSS DBC-750 Combiners (6) Ericsson RRUS-11 RRHs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (1) 3" Rigid Conduit	AT&T	152	(3) T-Frames
143.5	(3) Sinclair SD312HL Dipoles	(3) 7/8"	Town of Clinton	140	(3) Standoffs
100	(1) Radiowaves RDH4518A Dish	(2) CAT 5e		100	(1) Pipe Mount

Proposed Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
192.5	(3) Ericsson AIR B2A B4P (3) Ericsson AIR B4A B2P (3) Ericsson KRY 112 144-1 Double TMAs	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	192	(3) T-Frames

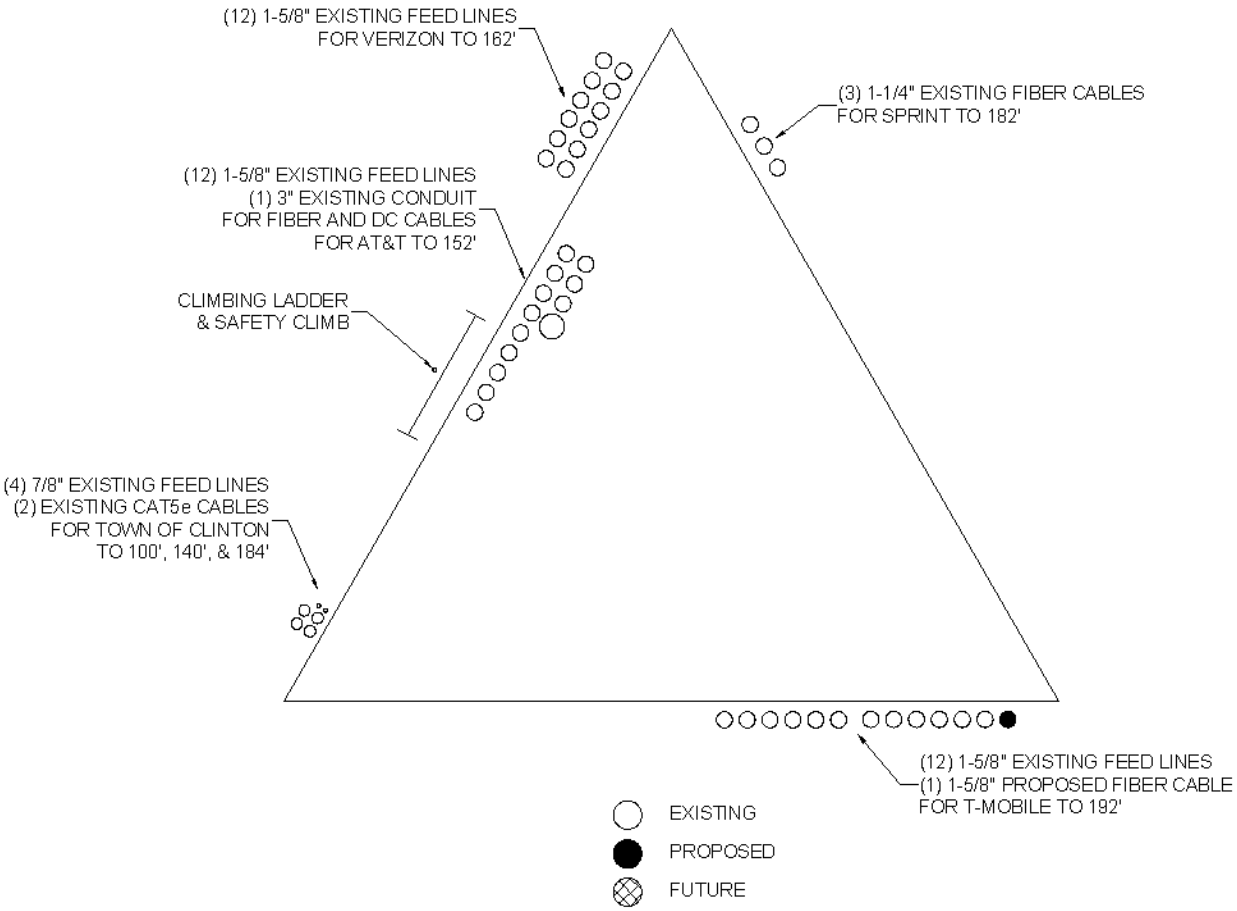


Figure 1 – Feed Line Layout

RESULTS

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

Table 2 - Material Strength

Member Type	Yield Strength
Legs	50 ksi
Bracing	36 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. *Note: Capacities up to 100% are considered acceptable.* **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
T1	195 - 180	Leg	P2x.154	33.8	Pass
		Diagonal	L1 3/4x1 3/4x3/16	25.2 33.4 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	3.0 3.1 (b)	Pass
T2	180 - 160	Leg	P3x.216	49.1	Pass
		Diagonal	L1 3/4x1 3/4x3/16	54.5	Pass
		Top Girt	L1 3/4x1 3/4x3/16	5.6	Pass
T3	160 - 140	Leg	P3x.3	73.7	Pass
		Diagonal	L2x2x3/16	79.0	Pass
T4	140 - 120	Leg	P4x.337	74.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	69.5	Pass
T5	120 - 100	Leg	P5x.375	65.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	93.5	Pass
T6	100 - 80	Leg	P6x.28	83.8	Pass
		Diagonal	L3x3x3/16	73.3	Pass
T7	80 - 60	Leg	P6x.432	72.5	Pass
		Diagonal	L3x3x1/4	97.6	Pass
T8	60 - 40	Leg	P8x.322	76.4	Pass
		Diagonal	L3x3 1/2x1/4	99.5	Pass
T9	40 - 20	Leg	P8x.322	86.0	Pass
		Diagonal	L3 1/2x3 1/2x1/4	95.5	Pass
T10	20 - 0	Leg	P8x.5	63.1	Pass
		Diagonal	L3 1/2x4x1/4	98.7	Pass

* Capacities include 1/3 allowable stress increase for wind per the *TIA/EIA-222-F* standards.

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Individual Foundation	Horizontal*	30 k	29 k
	Uplift	247 k	258 k
	Compression	281 k	306 k
Overturning Moment	---	5,334 k-ft	5,764 k-ft

* Per our experience with foundations of similar type, the shear loading should not control the foundation analysis.

Table 5 – Maximum Antenna Rotations at Service Wind Speed

Centerline Elevation (ft)	Antenna	Tilt (deg)*	Twist (deg)*
100	(1) Radiowaves RDH4518A Dish	0.1579	0.0042

* Allowable tilt and twist values to be reviewed by the carrier.

GENERAL COMMENTS

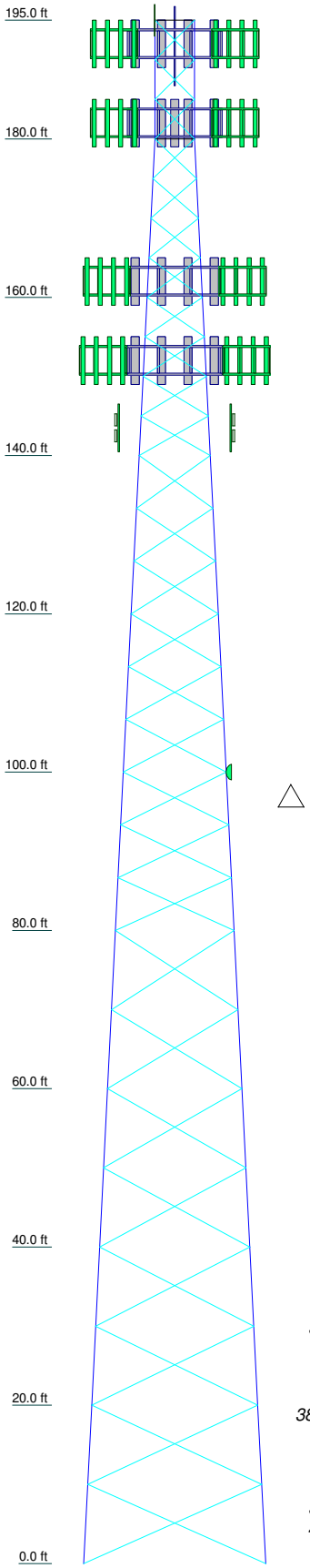
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading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

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10		
Legs	P2x.154 (2.38 OD)	P3x.216 (3.5 OD)	P3x.300 (3.50 OD)	P4x.337 (4.50 OD)	P5x.375 (5.5625 OD)	P6x.28 (6.625 OD)	P6x.432 (6.625 OD)	P8x.322 (8.625 OD)		P8x.5 (8.625 OD)		
Leg Grade	A572-50											
Diagonals	L1 3/4x1 3/4x3/16		L2x2x3/16	L2 1/2x2 1/2x3/16		L3x3x3/16	L3x3x1/4	L3x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3 1/2x4x1/4		
Diagonal Grade	A36											
Top Girts	L1 3/4x1 3/4x3/16											
Face Width (ft)	5		7	9	11	13	15	17	19	21	23	
# Panels @ (ft)	11 @ 5			9 @ 6.66667				8 @ 10				
Weight (K)	0.5	0.9	1.2	1.6	2.0	2.2	2.8	3.0	3.3	4.4	21.8	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	195	BXA-171063/8BF w/ Mount Pipe	162
AIR 21 B2A/B4P w/Mount Pipe	192	BXA-171063/8BF w/ Mount Pipe	162
AIR 21 B2A/B4P w/Mount Pipe	192	BXA-171063/12CF w/ Mount Pipe	162
AIR 21 B2A/B4P w/Mount Pipe	192	LPA-80063/6CF w/ Mount Pipe	162
AIR 21 B4A/B2P w/Mount Pipe	192	LPA-80063/6CF w/ Mount Pipe	162
AIR 21 B4A/B2P w/Mount Pipe	192	(2) RFS FD9R6004/2C-3L Diplexer	162
AIR 21 B4A/B2P w/Mount Pipe	192	(2) RFS FD9R6004/2C-3L Diplexer	162
KRY 112 144/1	192	(2) RFS FD9R6004/2C-3L Diplexer	162
KRY 112 144/1	192	(3) T-Frames	162
KRY 112 144/1	192	(2) RRUS-11	152
(3) T-Frames	192	(2) RRUS-11	152
PD1151	184	(2) RRUS-11	152
Standoff	184	Raycap DC6-48-60-18-8F	152
APXVSPP18-C-A20 w/Mount Pipe	182	(3) T-Frames	152
APXVSPP18-C-A20 w/Mount Pipe	182	(3) AM-X-CD-14-65-00T w/ Mount Pipe	152
APXVSPP18-C-A20 w/Mount Pipe	182	(3) AM-X-CD-14-65-00T w/ Mount Pipe	152
RRU-ALU 1900MHZ	182	(3) AM-X-CD-14-65-00T w/ Mount Pipe	152
RRU-ALU 1900MHZ	182	7770 w/ Mount Pipe	152
RRU-ALU 1900MHZ	182	7770 w/ Mount Pipe	152
RRU-ALU 800MHZ	182	7770 w/ Mount Pipe	152
RRU-ALU 800MHZ	182	(2) TT19-08BP111-001 TMA	152
RRU-ALU 800MHZ	182	(2) TT19-08BP111-001 TMA	152
Filter- ALU 800MHZ	182	(2) TT19-08BP111-001 TMA	152
Filter- ALU 800MHZ	182	TMA - LGP13519	152
Filter- ALU 800MHZ	182	TMA - LGP13519	152
(2) ACU-A20-N RET	182	TMA - LGP13519	152
ACU-A20-N RET	182	Combiner - CSS DBC-750	152
ACU-A20-N RET	182	Combiner - CSS DBC-750	152
(3) T-Frames	182	Combiner - CSS DBC-750	152
BXA-70063/6CF w/ Mount Pipe	162	Sinclair SD312HL	140
BXA-70063/6CF w/ Mount Pipe	162	Sinclair SD312HL	140
BXA-70063/6CF w/ Mount Pipe	162	Sinclair SD312HL	140
(2) LPA-80063/4CF w/ Mount Pipe	162	(3) Standoffs	140
LPA-80063/4CF w/ Mount Pipe	162	Pipe Mount	100
LPA-80063/4CF w/ Mount Pipe	162	RDH4518A	100

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.5%

MAX. CORNER REACTIONS AT BASE:
DOWN: 281 K
SHEAR: 30 K

UPLIFT: -247 K
SHEAR: 26 K

AXIAL
81 K
SHEAR
14 K
MOMENT
1619 kip-ft

TORQUE 4 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
40 K
SHEAR
48 K
MOMENT
5334 kip-ft

TORQUE 11 kip-ft
REACTIONS - 85 mph WIND

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

Job: Clinton 4, CT01879-S			
Project: 13THU71400			
Client: SBA Network Services, Inc.	Drawn by: Christopher B. Stryffeler, EI		App'd:
Code: TIA/EIA-222-F	Date: 12/27/13		Scale: NTS
Path:			Dwg No. E-1

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11429A

Clinton / Route 1
46 Meadow Street
Clinton, CT 06413

January 09, 2014

EBI Project Number: 62140003

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

EBI Consulting
environmental | engineering | due diligence

January 9, 2014

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

Re: Emissions Values for Site: **CT11429A – Clinton / Route 1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 46 Meadow Road, Clinton, 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 46 Meadow Road, Clinton, 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 **192.5 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	CT11429A - Clinton Route 1
Site Addresss	46 Meadow Road, Clinton, CT 06413
Site Type	Self Support Tower

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 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	192.5	186.5	None	0	0	48.326044	0.499493	0.04995%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	192.5	186.5	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
														Sector total Power Density Value:		0.100%	

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 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	192.5	186.5	None	0	0	48.326044	0.499493	0.04995%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	192.5	186.5	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
														Sector total Power Density Value:		0.100%	

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 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	192.5	186.5	None	0	0	48.326044	0.499493	0.04995%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	192.5	186.5	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	192.5	186.5	1-5/8"	0	0	24.163022	0.249747	0.02497%
														Sector total Power Density Value:		0.100%	

Site Composite MPE %

Carrier	MPE %
T-Mobile	0.300%
AT&T	5.960%
Verizon Wireless	19.400%
Sprint	3.450%
Total Site MPE %	**29.110%**

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 **0.300% (0.100% 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 **29.111%** 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