



March 12, 2015

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

RE: Notice of Exempt Modification
101 Burbank Road, Ellington, CT 06029
N 41° 56' 10.53"
W 72° 23' 7.36"
T-Mobile Site #: CT11292A_L700

Dear 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 101 Burbank Road, Ellington, CT 06029.

The 101 Burbank Road, Ellington, CT facility consists of a 181.5' Self-Support Tower owned and operated by SBA Tower V, 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 L700 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 the 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 508.251.0720 x 3804 with any questions you may have concerning this matter.

Thank you,



Kri Pelletier
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbsite.com



**T-Mobile
Equipment Modification**

101 Burbank Road, Ellington, CT 06029
Site number CT11292A_L700

Tower Owner: SBA Tower V, LLC

Equipment Configuration: Self-Support Tower

Current and/or approved:

- (6) EMS RR90-17-02DP
- (6) Decibel DBE15501P64D
- (6) 1-5/8" Coax and Lines

Planned Modifications:

- (3) EMS RR90-17-02DP
- (3) Commscope LNX-6515DS
- (3) Ericsson KRY 112 144/1
- (3) Kathrein 782 11056
- (12) 1-5/8" Coax and Lines

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 2.93% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 31.52% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE%	
Carrier	MPE%
T-Mobile	2.93
Verizon Wireless	8.91 %
Crossroads	2.34 %
AT&T	17.34 %
Site Total MPE %:	31.52 %



March 12, 2015

Maurice W. Blanchette, First Selectman
Town of Ellington
55 Main Street
Ellington, CT 06029

RE: Telecommunications Facility @ 101 Burbank Road, Ellington, CT 06029

Dear Mr. Blanchette,

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 508.251.0720 x 3804.

Thank you,

A handwritten signature in black ink, appearing to read "Kri Pelletier", written in a cursive style.

Kri Pelletier
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbsite.com



March 12, 2015

Donald E. and Rosalie M. Stavens
P.O. Box 1873
Edgartown MA 02539

RE: Telecommunications Facility @ 101 Burbank Road, Ellington, CT 06029

Dear Mr. and Mrs. Stavens:

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 508.251.0720 x 3804.

Thank you,

A handwritten signature in black ink, appearing to read "Kri Pelletier", is written over a light blue horizontal line.

Kri Pelletier
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbsite.com

SBA Network Services, LLC

To: CONNECTICUT SITING COUNCIL 129986

Check Number: 2091852
Date: 02/17/2015

Invoice Number	Invoice Date	Description	Gross Amount	Taxes Withheld	Net Amount
PRSF02161514	02/17/2015	CT11292A_700 CSC	\$625.00	\$0.00	\$625.00

\$625.00 \$0.00 \$625.00

SBA Network Services, LLC
5900 Broken Sound Parkway NW
Boca Raton, FL 33487-2797
(561) 995-7670

Wells Fargo Bank

2091852

061209756

129986

DATE

AMOUNT

02/17/2015

\$625.00

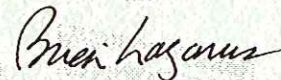
Void After 120 Days

Six Hundred Twenty Five Dollars And 00 Cents

Pay to the Order of:

CONNECTICUT SITING COUNCIL
ACCOUNTS RECEIVABLE
TEN FRANKLIN SQUARE

NEW BRITAIN, CT 06051



⑈ 2091852⑈⑈061209756⑈⑈2079900424566⑈



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

181.5' Self-Support Tower (189' AGL)

**SBA Site Name: Ellington
SBA Site ID: CT10008-A-03
T-Mobile Site ID: CT11292A
Site Address: 101 Burbank Road, Ellington, CT 06029**

FDH Project Number 15BFFX1400

Analysis Results

Tower Components	63.4 %	Sufficient
Foundation	70.5 %	Sufficient

Prepared By:

Zachary Shepherd, EI
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director – Structural Engineering
CT PE License No. 23247

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



March 2, 2015

03-02-2015

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 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 existing self-supported tower located in Ellington, 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*. Information pertaining to the existing/proposed antenna loading, soil parameters, current tower geometry, the member sizes, and foundation dimensions was obtained from:

- Rohn Industries (File No. 42895AE) original tower and foundation drawings dated April 3, 2000
- Applied Earth Technologies (Site Address 101 Burbank Rd. Ellington ,CT) Report on Subsurface Investigation dated February 14, 2000
- FDH Inc. (Project No. 07-0316T) TIA Inspection Report dated April 11, 2007
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F standards and the 2005 Connecticut State Building Code* is 85 mph without ice and 38 mph with 1 " radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 175 ft., the tower meets the requirements of the *TIA/EIA-222-F standards and the 2005 Connecticut State Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Rohn Industries File No. 42895AE), the foundations should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F standards and the 2005 Connecticut State Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. Coax must be installed as shown in **Figure 1**.
2. RRU/RRH Stipulation: The proposed equipment may be installed in any arrangement as determined by the client.

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	Carrier	Mount Elevation (ft)	Mount Type
194.5	(1) Decibel DB222-A Dipole	(1) 1-1/4"	NE Site Management	189	Direct Mount
186	(6) EMS RR90-17-02DP (6) Decibel DBE15501P64D	(6) 1-5/8"	T-Mobile	186	(3) 13' T-Frames
177	(2) Antel BXA-70063/4CF (6) Antel LPA-80080/4CF (3) Antel BXA-171085-8BF (1) Antel BXA-70080/4CF (3) Kathrein 742 213 (6) RFS FD9R6004/2C-3L (3) Alcatel Lucent RRH2x40-AWS (1) RFS DB-T1-6Z-8AB-0Z	(12) 1-5/8" (1) 1-5/8" Hybrid	Verizon	177	(3) 14' T-Frames
156	(3) Kathrein 800-10121 (4) Powerwave P65-17-XLH-RR (2) KMW AM-X-CD-16-65-005-RET (3) Powerwave 7770.00 (6) Powerwave TT19-08BP111-001 (6) CCI DTMAPB7819VG12A (6) Kathrein 860-10025 (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 3/8" RET (1) 3" Flex Conduit	AT&T	157	(3) 12' T-Frames
78	(1) GPS	(1) 1/2"	Verizon	78	Direct Mount
32	(1) GPS	(1) 1/2"	Cingular	32	Direct Mount

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
182.5	(3) EMS RR90-17-02DP (3) Commscope LNX-6515DS (3) Ericsson KRY 112 144/1 (3) Kathrein 782 11056	(12) 1-5/8"	T-Mobile	186	(3) 13' T-Frames

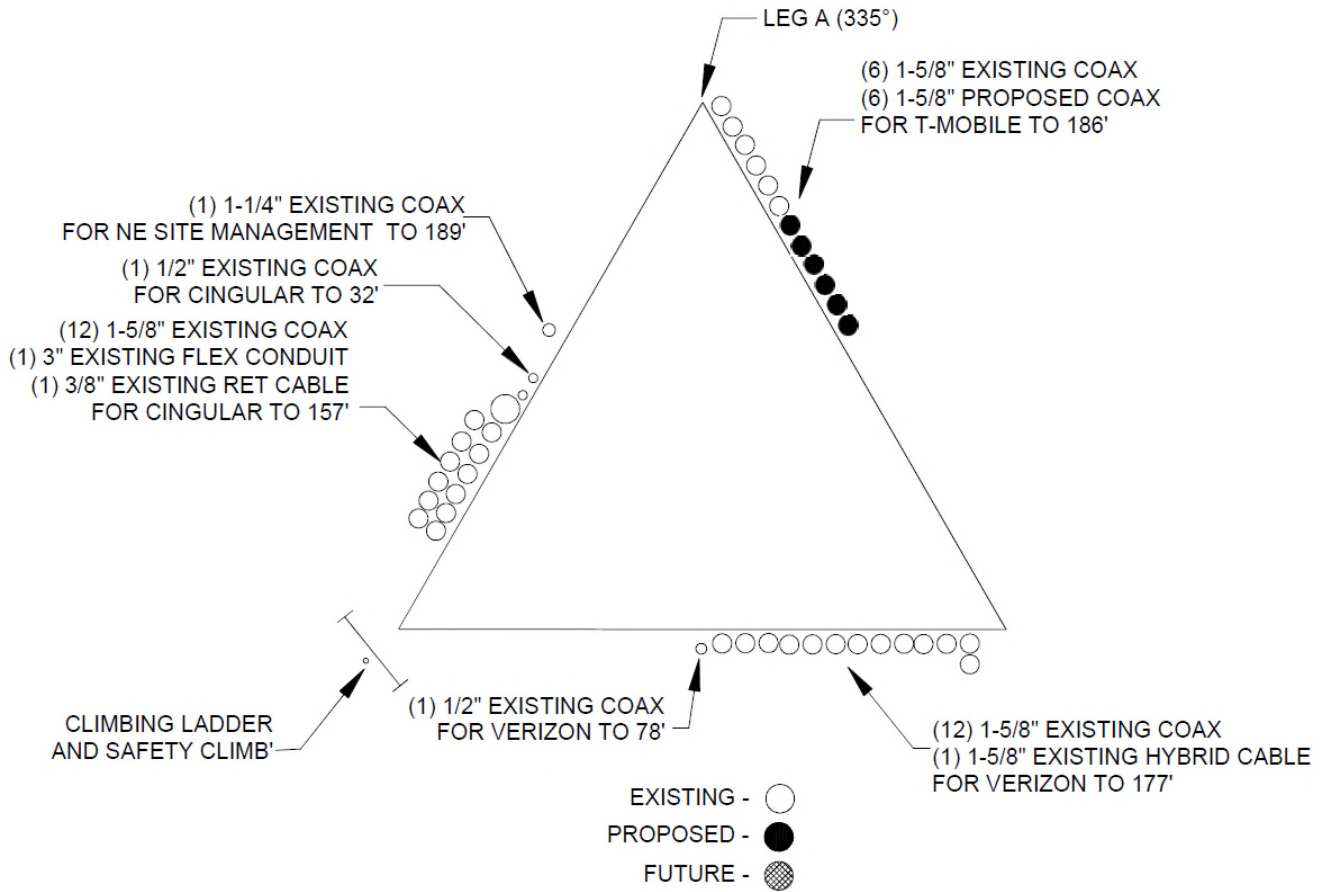


Figure 1- Coax Layout

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	50 ksi & 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 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
T1	181.5 - 161.333	Leg	P2x.203	40.4	Pass
		Diagonal	L2x2x1/4	23.2 46.6 (b)	Pass
		Top Girt	L2x2x1/4	1.9	Pass
T2	161.333 - 141.167	Leg	P3x.3	57.5	Pass
		Diagonal	L2x2x1/4	31.8 53.3 (b)	Pass
		Top Girt	L2x2x1/4	0.5	Pass
T3	141.167 - 121	Leg	Pipe 4.5" x 0.337" (4 XS)	62.2	Pass
		Diagonal	L2x2x1/4	49.6 55.1 (b)	Pass
T4	121 - 100.834	Leg	Pipe 5.563" x 0.375" (5 XS)	59.5	Pass
		Diagonal	L2 1/2x2 1/2x1/4	44.0 56.6 (b)	Pass
T5	100.834 - 80.667	Leg	Pipe 6 EH	63.4	Pass
		Diagonal	L2 1/2x2 1/2x1/4	60.8	Pass
T6	80.667 - 60.5004	Leg	Pipe 6.625" x 0.432" (6 XS)	60.0	Pass
		Diagonal	L3x3x1/4	48.7	Pass
T7	60.5004 - 40.3338	Leg	P8x.375	60.1	Pass
		Diagonal	L3 1/2x3 1/2x1/4	50.5 51.8 (b)	Pass
T8	40.3338 - 20.1672	Leg	Pipe 8.625" x 0.50" (8 XS)	52.0 53.0 (b)	Pass
		Diagonal	L4x4x1/4	47.2 61.5 (b)	Pass
T9	20.1672 - 0	Leg	Pipe 8.625" x 0.50" (8 XS)	57.9	Pass
		Diagonal	L4x4x1/4	57.3 62.6 (b)	Pass

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Individual Foundation	Horizontal	27 k	59 k
	Uplift	220 k	333 k
	Compression	258 k	369 k
Overturing Moment	---	4,463 k-ft	6,330 k-ft

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	189	BXA-171085-8BF-EDIN-X w/Mount Pipe	177
DB222-A	189		
RR90-17-02DP w/Mount Pipe	186	BXA-171085-8BF-EDIN-X w/Mount Pipe	177
RR90-17-02DP w/Mount Pipe	186		
RR90-17-02DP w/Mount Pipe	186	BXA-70080/4CF w/ Mount Pipe	177
(3) 13' T-Frames	186	7770.00 w/Mount Pipe	157
(2) Pipe Mount	186	7770.00 w/Mount Pipe	157
(2) Pipe Mount	186	(2) TT19-08BP111-001 TMA	157
(2) Pipe Mount	186	(2) TT19-08BP111-001 TMA	157
LNX-6515DS w/ Mount Pipe	186	(2) TT19-08BP111-001 TMA	157
LNX-6515DS w/ Mount Pipe	186	(2) DTMA7819VG12A TMA	157
LNX-6515DS w/ Mount Pipe	186	(2) DTMA7819VG12A TMA	157
KTY 112-114/1	186	(2) DTMA7819VG12A TMA	157
KTY 112-114/1	186	(2) 860 10025 RET	157
KTY 112-114/1	186	(2) 860 10025 RET	157
782 11056	186	(2) 860 10025 RET	157
782 11056	186	(2) RRUS-11	157
(2) FD9R6004/2C-3L Diplexer	177	(2) RRUS-11	157
(2) FD9R6004/2C-3L Diplexer	177	(2) RRUS-11	157
(2) FD9R6004/2C-3L Diplexer	177	DC6-48-60-18-8F	157
742 213 w/ Mount Pipe	177	(3) 14' T-Frames	157
742 213 w/ Mount Pipe	177	800 10121 w/ Mount Pipe	157
742 213 w/ Mount Pipe	177	800 10121 w/ Mount Pipe	157
742 213 w/ Mount Pipe	177	800 10121 w/ Mount Pipe	157
RRH2X40-AWS	177	(2) P65-17-XLH-RR w/Mount Pipe	157
RRH2X40-AWS	177	P65-17-XLH-RR w/Mount Pipe	157
RRH2X40-AWS	177	P65-17-XLH-RR w/Mount Pipe	157
DB-T1-6Z-8AB-0Z	177	AM-X-CD-16-65-005-RET w/ Mount Pipe	157
(3) 14' T-Frames	177	AM-X-CD-16-65-005-RET w/ Mount Pipe	157
BXA-70063/4CF w/ Mount Pipe	177		
BXA-70063/4CF w/ Mount Pipe	177	7770.00 w/Mount Pipe	157
(2) LPA-80080/4CF W/Mount Pipe	177	GPS	78
(2) LPA-80080/4CF W/Mount Pipe	177	GPS	32
(2) LPA-80080/4CF W/Mount Pipe	177		
BXA-171085-8BF-EDIN-X w/Mount Pipe	177		

MATERIAL STRENGTH

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

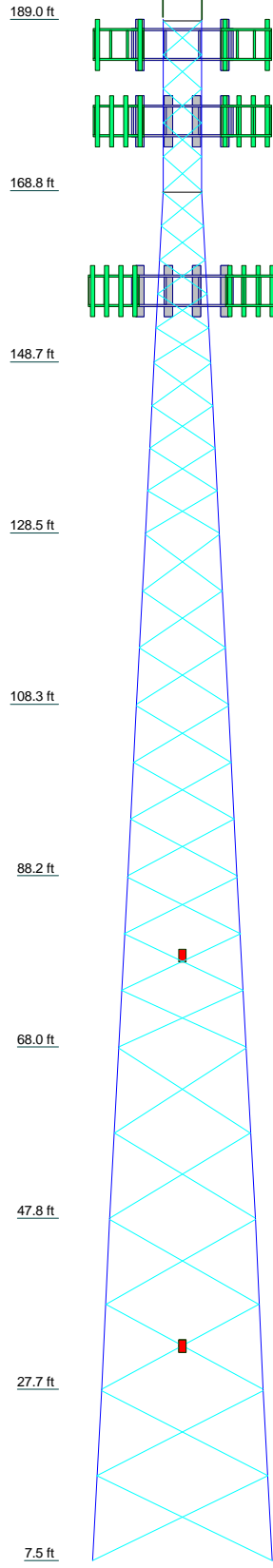
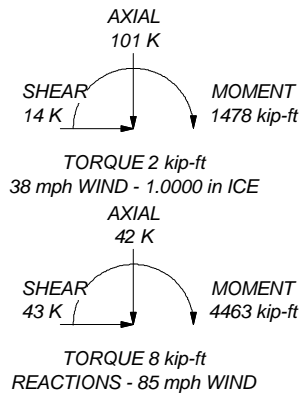
TOWER DESIGN NOTES

1. Tower is located in Tolland 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 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 63.4%

MAX. CORNER REACTIONS AT BASE:

DOWN: 258 K
SHEAR: 27 K

UPLIFT: -220 K
SHEAR: 23 K



Section	T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs	ROHN 2.5 STD	ROHN 3 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH	ROHN 8 EHS	ROHN 8 EH	
Leg Grade					A572-50				
Diagonals					L2 1/2x2 1/2x1/4	L3x3x1/4	L3 1/2x3 1/2x1/4	L4x4x1/4	
Diagonal Grade						N.A.			
Top Girts	L3x3x1/4	L2x2x1/4	L2x2x1/4						
Face Width (ft)	4.58		6.63	8.68	10.78	12.91	14.92	17.09	19.04
# Panels @ (ft)	10 @ 4	1.3	4 @ 5	2.1	9 @ 6.666	3.1	3.3	4.3	4.4
Weight (K)	1.0		1.6		2.4				

<p>FDH Engineering, Inc. 6521 Meridian Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	Job: Ellington, CT1008-A		
	Project: 15BFFX1400		
	Client: SBA	Drawn by: ZShepherd	App'd:
	Code: TIA/EIA-222-F	Date: 03/02/15	Scale: NTS
Tower Analysis		Path:	Dwg No. E-1

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

T-Mobile Existing Facility

Site ID: CT11292A

Ellington / Rt 30
101 Burbank Road
Ellington, CT 06029

March 10, 2015

EBI Project Number: 6215001478

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	31.52 %

March 10, 2015

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

Emissions Analysis for Site: **CT11292A – Ellington / Rt 30**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **101 Burbank Road, Ellington, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **101 Burbank Road, Ellington, 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, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) 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.

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **EMS RR90_17_02DP** for 1900 MHz (PCS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **EMS RR90_17_02DP** has a maximum gain of **14.4 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **182.5 feet** above ground level (AGL).
- 9) 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 calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP
Gain:	14.4 dBd	Gain:	14.4 dBd	Gain:	14.4 dBd
Height (AGL):	182.5	Height (AGL):	182.5	Height (AGL):	182.5
Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	6,610.15	ERP (W):	6,610.15	ERP (W):	6,610.15
Antenna A1 MPE%	0.76	Antenna B1 MPE%	0.76	Antenna C1 MPE%	0.76
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX- 6515DS-VTM	Make / Model:	Commscope LNX- 6515DS-VTM	Make / Model:	Commscope LNX- 6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	182.5	Height (AGL):	182.5	Height (AGL):	182.5
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.21	Antenna B2 MPE%	0.21	Antenna C2 MPE%	0.21

Site Composite MPE%	
Carrier	MPE%
T-Mobile	2.93
Verizon Wireless	8.91 %
Crossroads	2.34 %
AT&T	17.34 %
Site Total MPE %:	31.52 %

T-Mobile Sector 1 Total:	0.98 %
T-Mobile Sector 2 Total:	0.98 %
T-Mobile Sector 3 Total:	0.98 %
Site Total:	31.52 %

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	0.98 %
Sector 2:	0.98 %
Sector 3 :	0.98 %
T-Mobile Total:	2.93 %
Site Total:	31.52 %
Site Compliance Status:	COMPLIANT

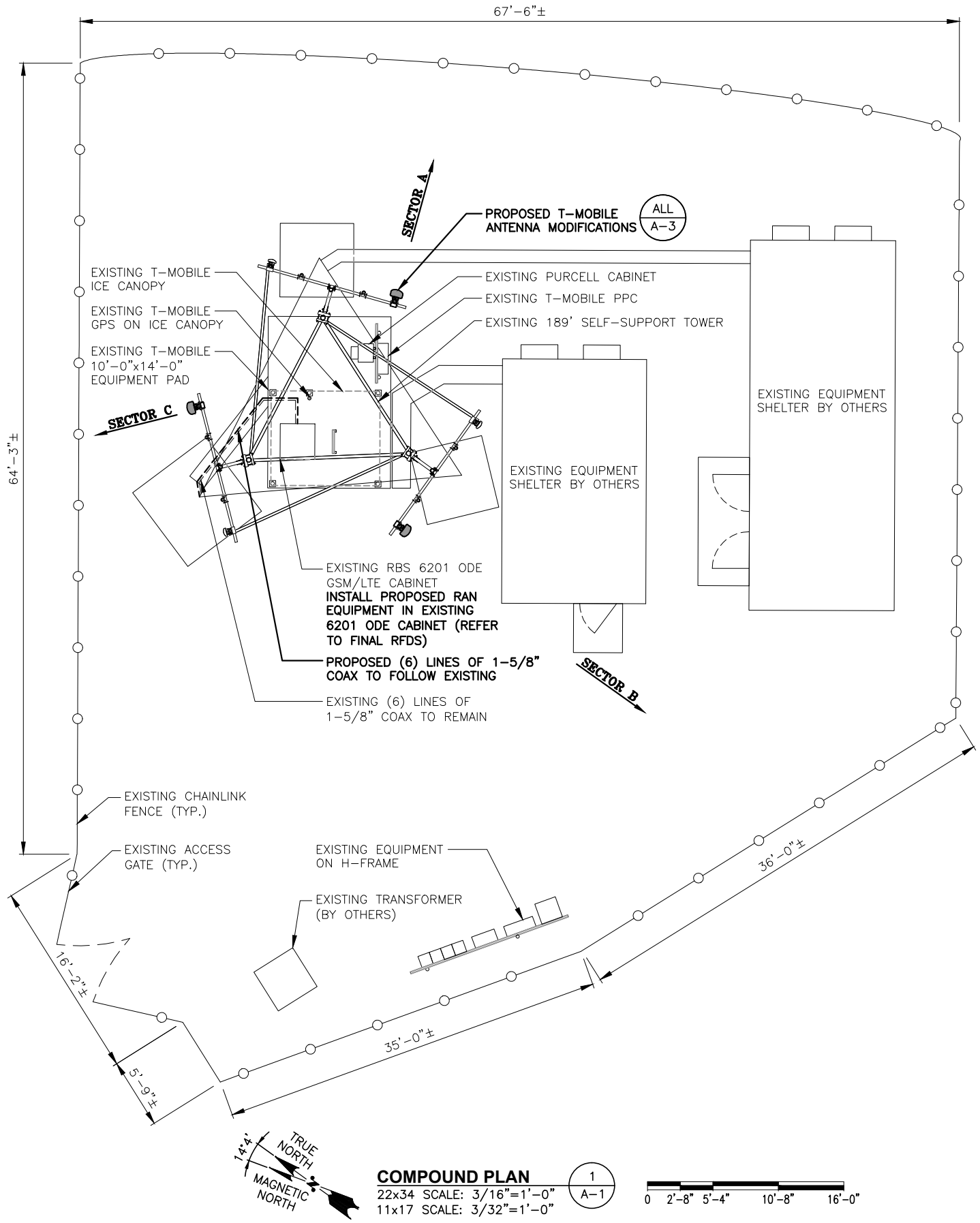
The anticipated composite MPE value for this site assuming all carriers present is **31.52%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



COMPOUND PLAN
 22x34 SCALE: 3/16"=1'-0"
 11x17 SCALE: 3/32"=1'-0"
 1 A-1

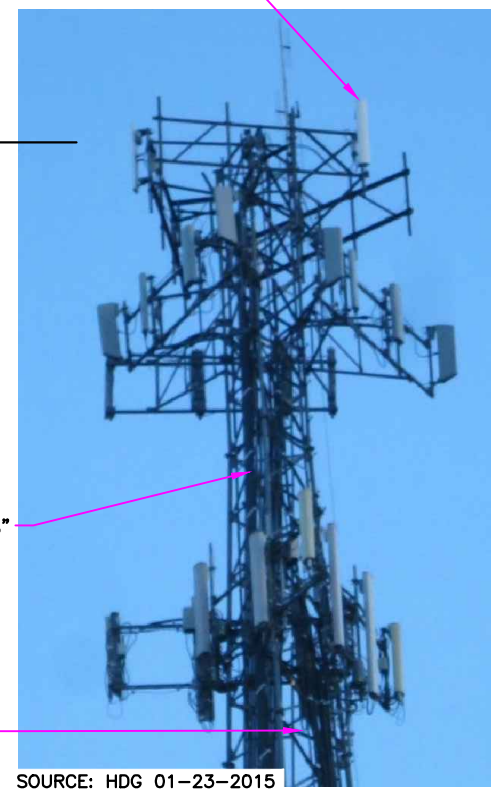


STRUCTURAL NOTES:
 1. ADDITIONAL TOWER MAPPING AND STRUCTURAL ANALYSIS ARE REQUIRED PRIOR TO CONSTRUCTION. DRAWINGS ARE SUBJECT TO CHANGE PENDING OUTCOME OF STRUCTURAL ANALYSIS.
 2. MOUNT ALL ANTENNAS, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.

ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:
 ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND DETERMINED THAT THE EXISTING ANTENNA MOUNT IS ADEQUATE TO ACCOMMODATE ADDITIONAL EQUIPMENT LOADS. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.

2 A-2
 1,2 A-3
 T-MOBILE PLATFORM
 ELEV. = 186.0'± A.G.L. (SBA*)

EXISTING T-MOBILE ANTENNA TO REMAIN (TYP.)



PROPOSED (6) LINES OF 1-5/8" COAX TO FOLLOW EXISTING

EXISTING (6) LINES OF 1-5/8" COAX TO REMAIN

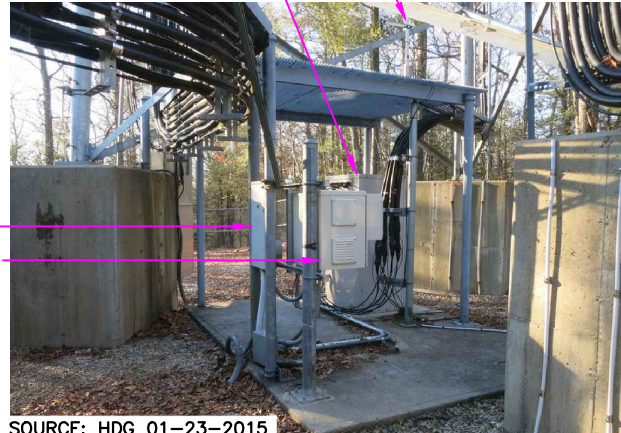
SOURCE: HDG 01-23-2015

PARTIAL ELEVATION PHOTO DETAIL
 SCALE: N.T.S.
 2 A-1

EXISTING T-MOBILE GPS ON ICE BRIDGE

EXISTING RBS 6201 ODE GSM/LTE CABINET
 INSTALL PROPOSED RAN EQUIPMENT IN EXISTING 6201 ODE CABINET (REFER TO FINAL RFDS)

EXISTING T-MOBILE PPC
 EXISTING PURCELL CABINET



SOURCE: HDG 01-23-2015

EQUIPMENT PHOTO DETAIL
 SCALE: N.T.S.
 3 A-1

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



SBA COMMUNICATIONS CORP.
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 MARLBOROUGH, MA 01752 FAX: (508) 251-1755

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



Daniel P. Hamm

CHECKED BY: KB

APPROVED BY: DPH

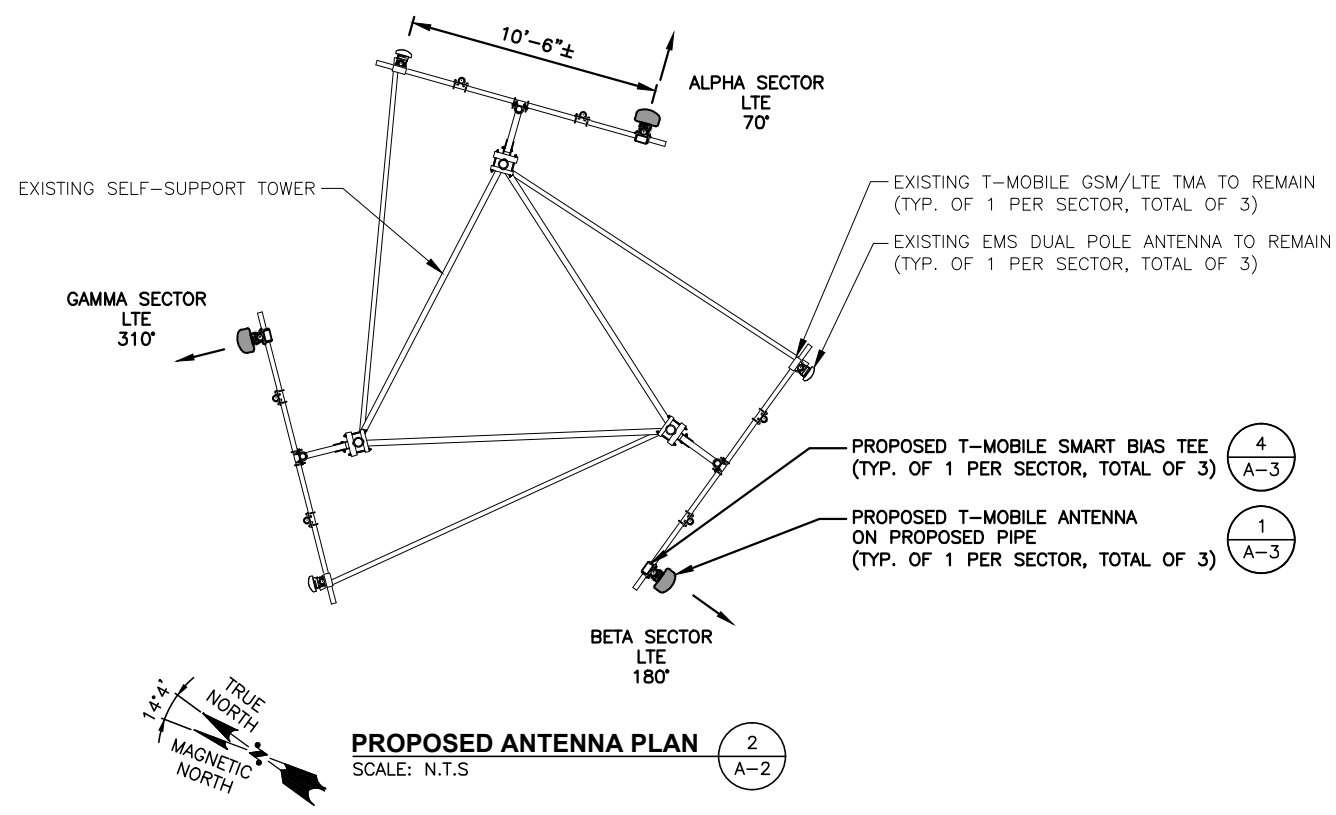
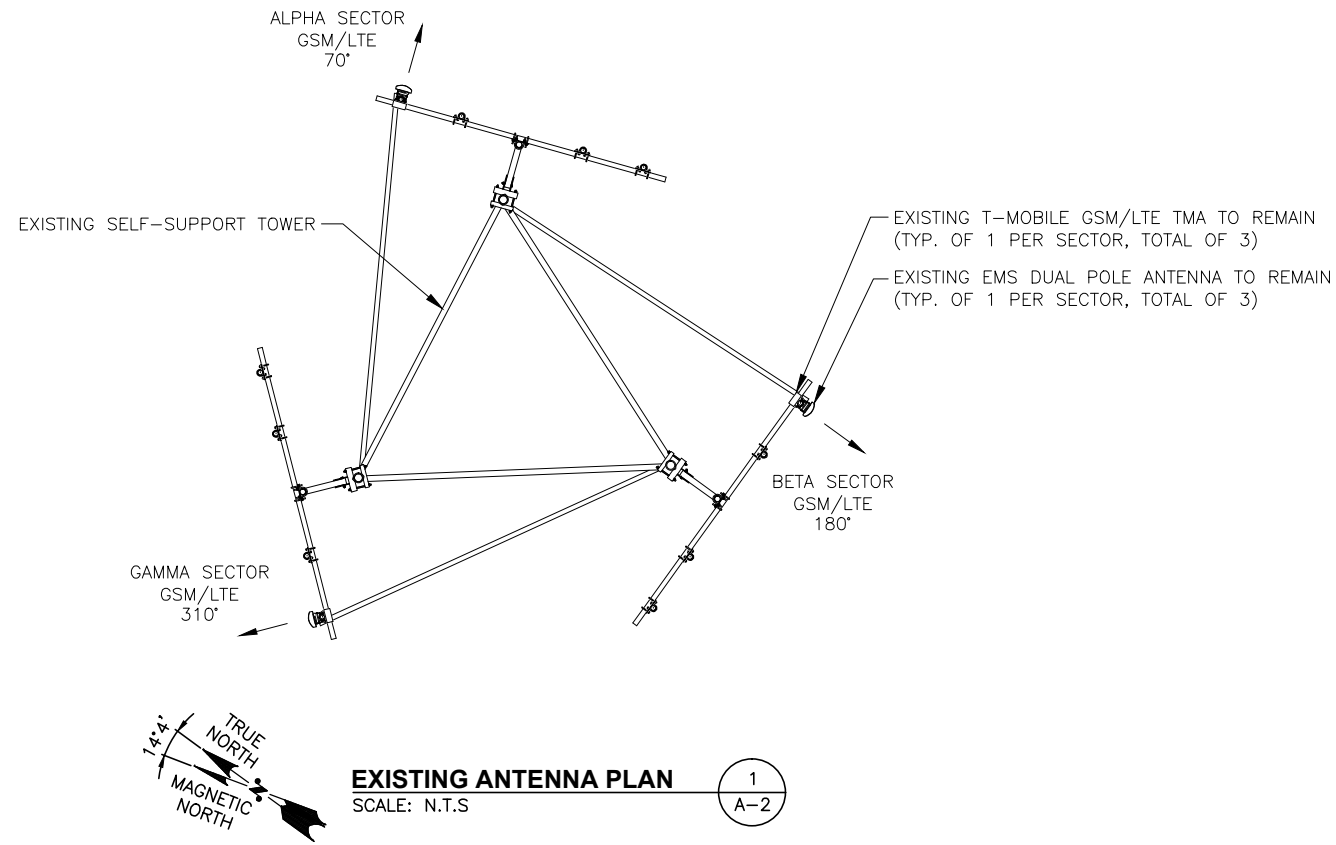
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	02/24/15	ISSUED FOR CONSTRUCTION	KMS

SITE NUMBER:
 CT11292A
 SITE NAME:
 ELLINGTON/RT 30
 SITE ADDRESS:
 101 BURBANK ROAD
 ELLINGTON, CT 06029
 TOLLAND COUNTY

SHEET TITLE
 COMPOUND &
 ELEVATION PLAN

SHEET NUMBER
A-1



STRUCTURAL NOTES:

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SPECIAL WORK NOTE:

VERTICALLY CENTER ON EXISTING MOUNTING RAIL, THE PIPE MAST AND ANTENNA

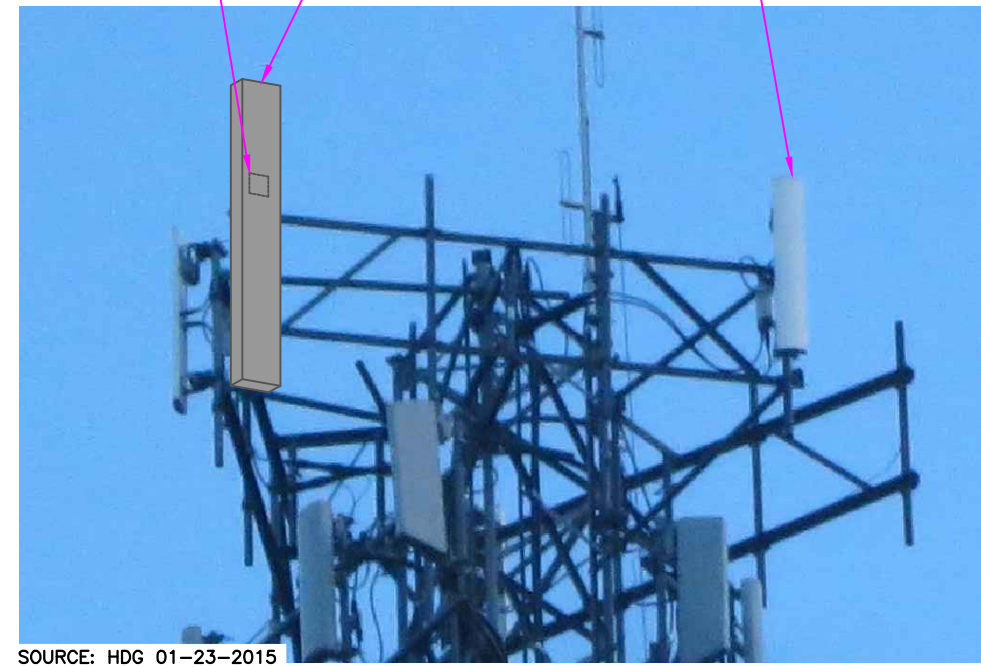
4
A-3

PROPOSED T-MOBILE SMART BIAS TEE (TYP. OF 1 PER SECTOR, TOTAL OF 3)

1
A-3

PROPOSED T-MOBILE ANTENNA ON PROPOSED PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING EMS DUAL POLE ANTENNA TO REMAIN (TYP. OF 1 PER SECTOR, TOTAL OF 3)



3
A-2

PROPOSED ANTENNA PHOTO DETAIL
SCALE: N.T.S.

**T-MOBILE
NORTHEAST LLC**

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BLOOMFIELD, CT 06002
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SBA

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Design Group**

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

Daniel P. Hamm

CHECKED BY: KB

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	02/24/15	ISSUED FOR CONSTRUCTION	KMS

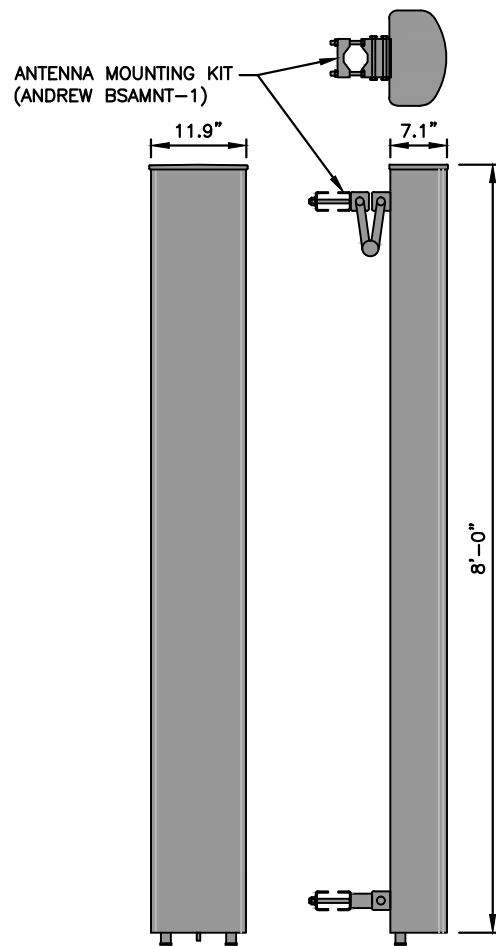
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CT11292A

SITE NAME:
ELLINGTON/RT 30

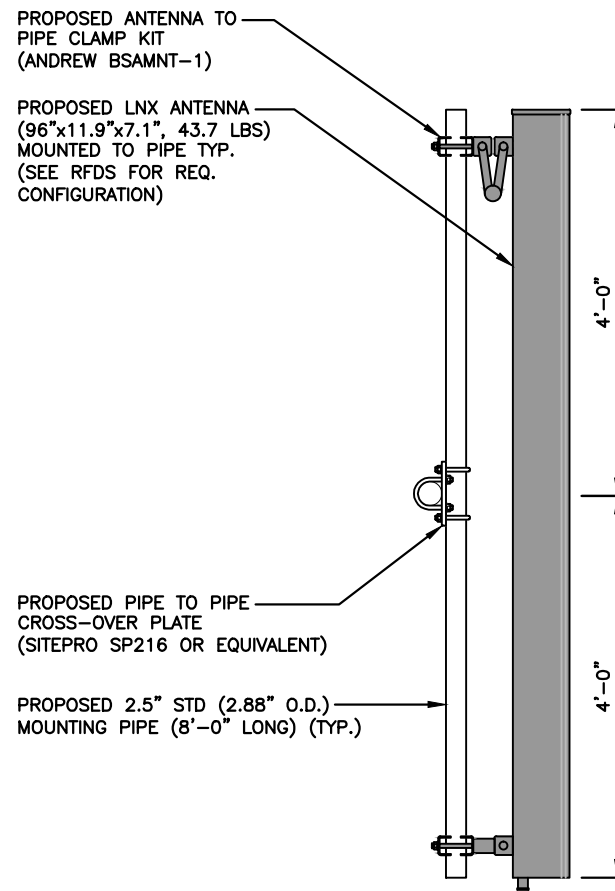
SITE ADDRESS:
101 BURBANK ROAD
ELLINGTON, CT 06029
TOLLAND COUNTY

SHEET TITLE
EXISTING &
PROPOSED ANTENNA
PLANS

SHEET NUMBER
A-2



LNx ANTENNA DETAIL 1
SCALE: N.T.S. A-3

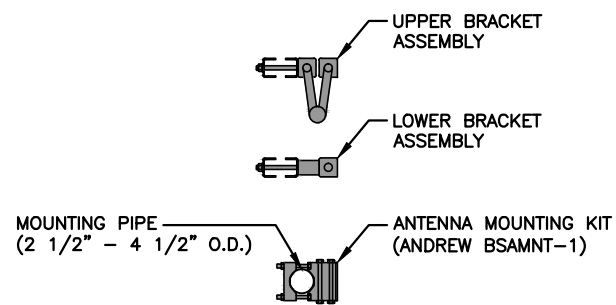


PROPOSED ANTENNA MOUNTING DETAIL 2
SCALE: N.T.S. A-3

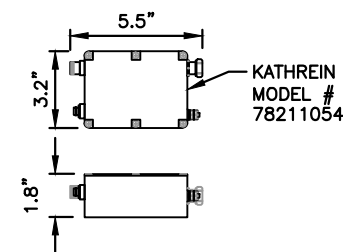
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VERTICALLY CENTER ON EXISTING MOUNTING RAIL, THE PIPE MAST AND ANTENNA



ANTENNA MOUNTING BRACKET 3
SCALE: N.T.S. A-3



SMART BIAS TEE (SBT) 4
SCALE: N.T.S. A-3

**T-MOBILE
NORTHEAST LLC**

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