



CRAIG CODY

16 Chestnut Street, Suite 421  
Foxboro, MA 02035  
Tel (781) 831-1281  
Fax (774) 215-5423

Melanie Bachman  
Executive Director  
Connecticut Siting Counsel  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – 305 W. Service Road, Hartford, CT**

Dear Ms. Bachman:

Please accept this letter as notification pursuant to R.C.S.A Section 16-50j-73, for construction that constitutes modification pursuant to R.C.S.A Section 16-50j-72(b) and 16-50j-73. In accordance with R.C.S.A Section 16-50j-73, a copy of this submission is being sent to the City of Hartford. A copy of this submission is also being sent to West Service Road Association, LLC., the property owner on which the tower is located.

**T-Mobile Northeast LLC's Proposed Wireless Modifications**

T-Mobile as successor in interest to Omnipoint Communications achieved an initial approval from the Siting Council to install antennas as well as related ground equipment and currently maintains this equipment. The facility consists of a One-Hundred and Fifty-Three (153') foot high communications tower within a fenced in compound. T-Mobile now intends to modify the facility as shown on the enclosed plans prepared by Infinigy Engineering and annexed hereto in Exhibit 1. The modifications will consist of adding three (3) new antennas at the existing AGL of One-Hundred and Twenty-Five feet (125'). A structural analysis has been completed for the site and attached as Exhibit 3.

**T-Mobile's Proposed Wireless Modifications Constitutes An "Exempt Modification"**

The proposed modification to the above mentioned Facility constitutes an exempt modification of an existing facility provided for in R.C.S.A Section 16-50j-72(b)(2) and Council regulations promulgated pursuant thereto.

- 1) The proposed modification will not result in an increase in the height of the existing tower.
- 2) The modifications will remain entirely within the limits of the leased area. The modifications therefor, will not require the extension of the boundary.

- 3) The proposed modification does not increase the noise levels at the boundary by six(6) decibels or more under normal conditions.
- 4) T-Mobile's proposed facility will not increase the cumulative radio frequency electromagnetic radiation power density at the Tower sites' boundary to or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. A cumulative General Power Density table for T-Mobile's proposed modified facility is included as Exhibit 2.
- 5) The facility has received all municipal zoning approvals and building permits. (Regs., Conn. State Agencies Section 16-50j-72))

For all the foregoing reasons, T-Mobile Northeast LLC respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A Section 16-50j-72(b)(2)

Respectfully submitted,

  
**Craig Cody** 781.831.1281

On behalf of American Tower Corporation  
c/o Tower Resource Management, Inc.  
16 Chestnut Street, Suite 421  
Foxboro, MA 02035

cc: **City of Hartford**  
**West Service Road Association, LLC**

Exhibit 1

Site Plan

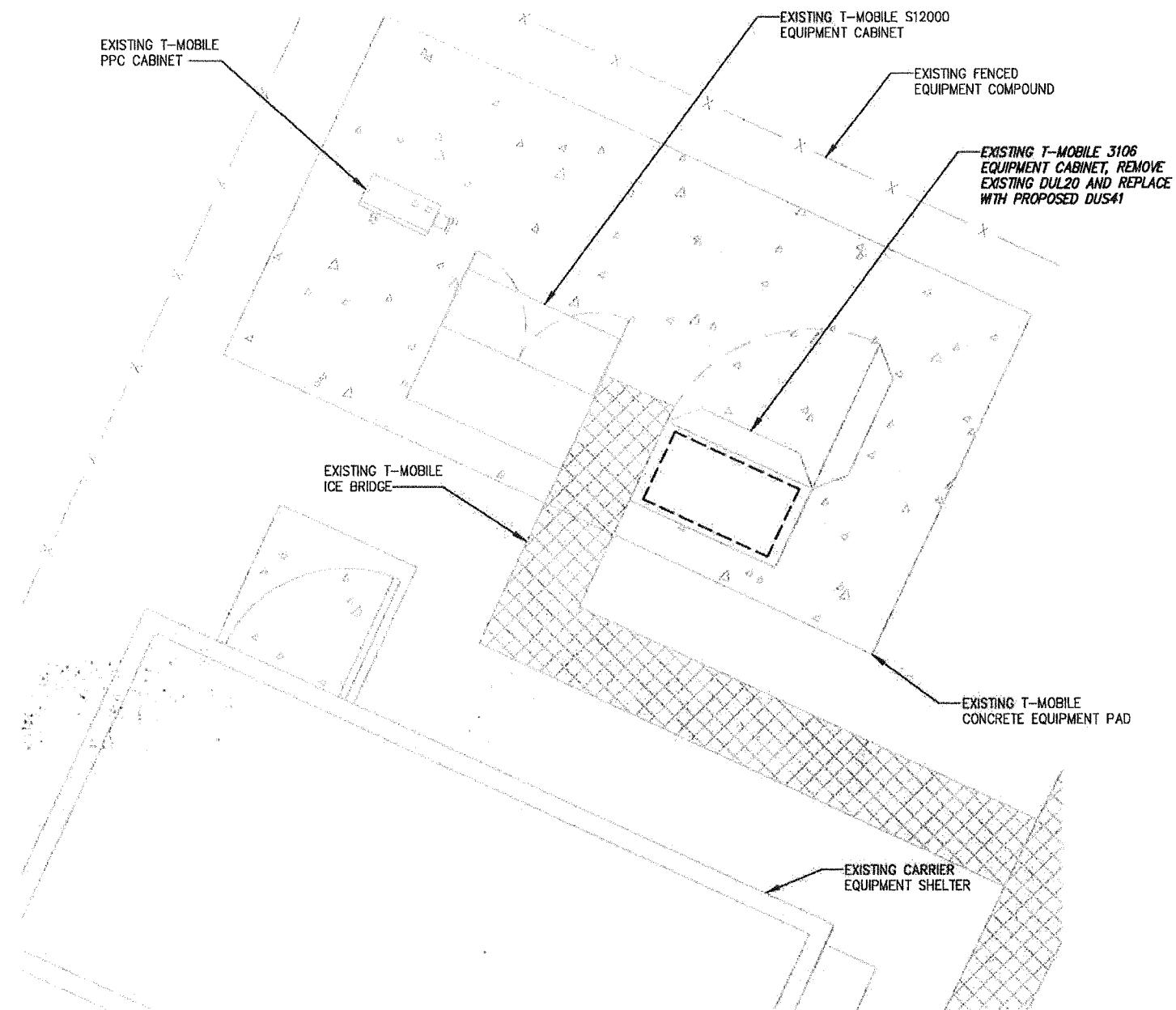


Exhibit 2  
Power Density Report

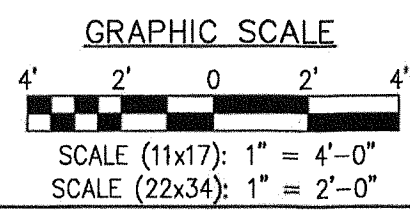
Exhibit 3  
Structural Analysis



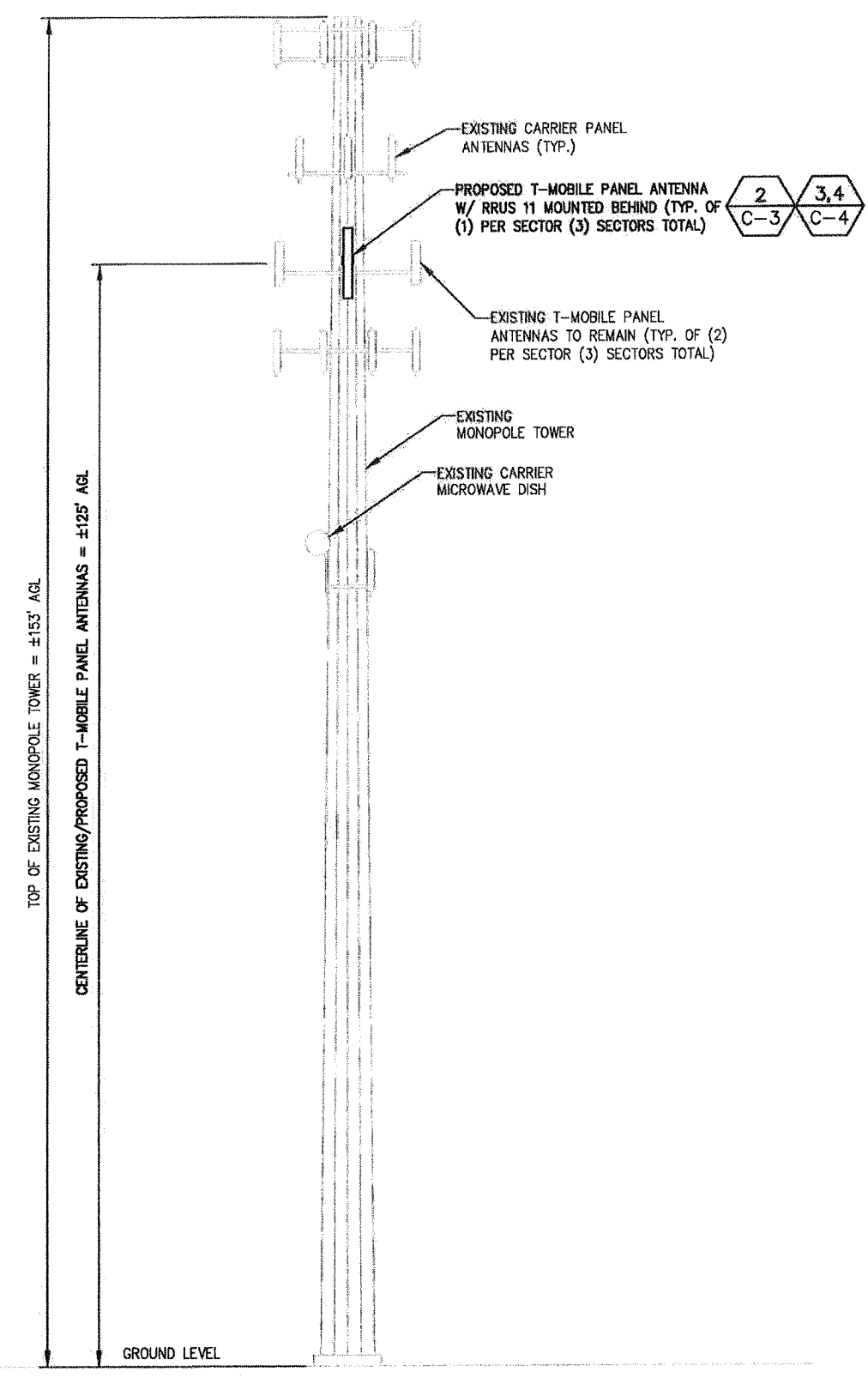




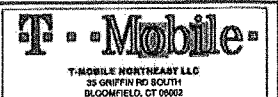
1 COMPOUND PLAN  
SCALE: AS NOTED



NOTE:  
INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER OR LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSIS.



2 TOWER ELEVATION  
NOT TO SCALE



INFINIGY  
1033 Westervillet Shaker Rd  
Albany, NY 12205  
Office # (518) 880-0780  
Fax # (518) 880-0783

SUBMITTALS		
DATE	DESCRIPTION	REVISION
10/02/15	FOR PERMIT	e

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 317-000  
DRAWN BY: MAP  
CHECKED BY: ASW



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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:  
CT11491B  
SITE NAME:  
CT491/SSITE HARTFORD\_MP1  
305 W. SERVICE RD  
HARTFORD, CT 06120

SHEET TITLE  
**COMPOUND PLAN & ELEVATION**

SHEET NUMBER  
**C-2**  
SHEET 3 OF 8 SHEETS



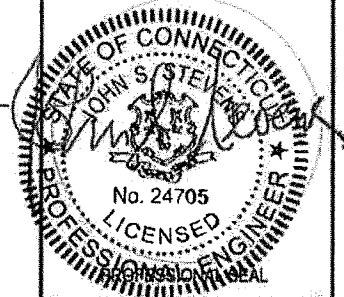




SUBMITTALS		
DATE	DESCRIPTION	REVISION
10/02/15	FOR PERMIT	0

DEPT.	DATE	APP'D	REVISIONS
RF			
RF MAIL			
TRAINING			
OPS			
CONTR.			
SITE AC.			

PROJECT NO: 317-000  
 DRAWN BY: MAP  
 CHECKED BY: ASW



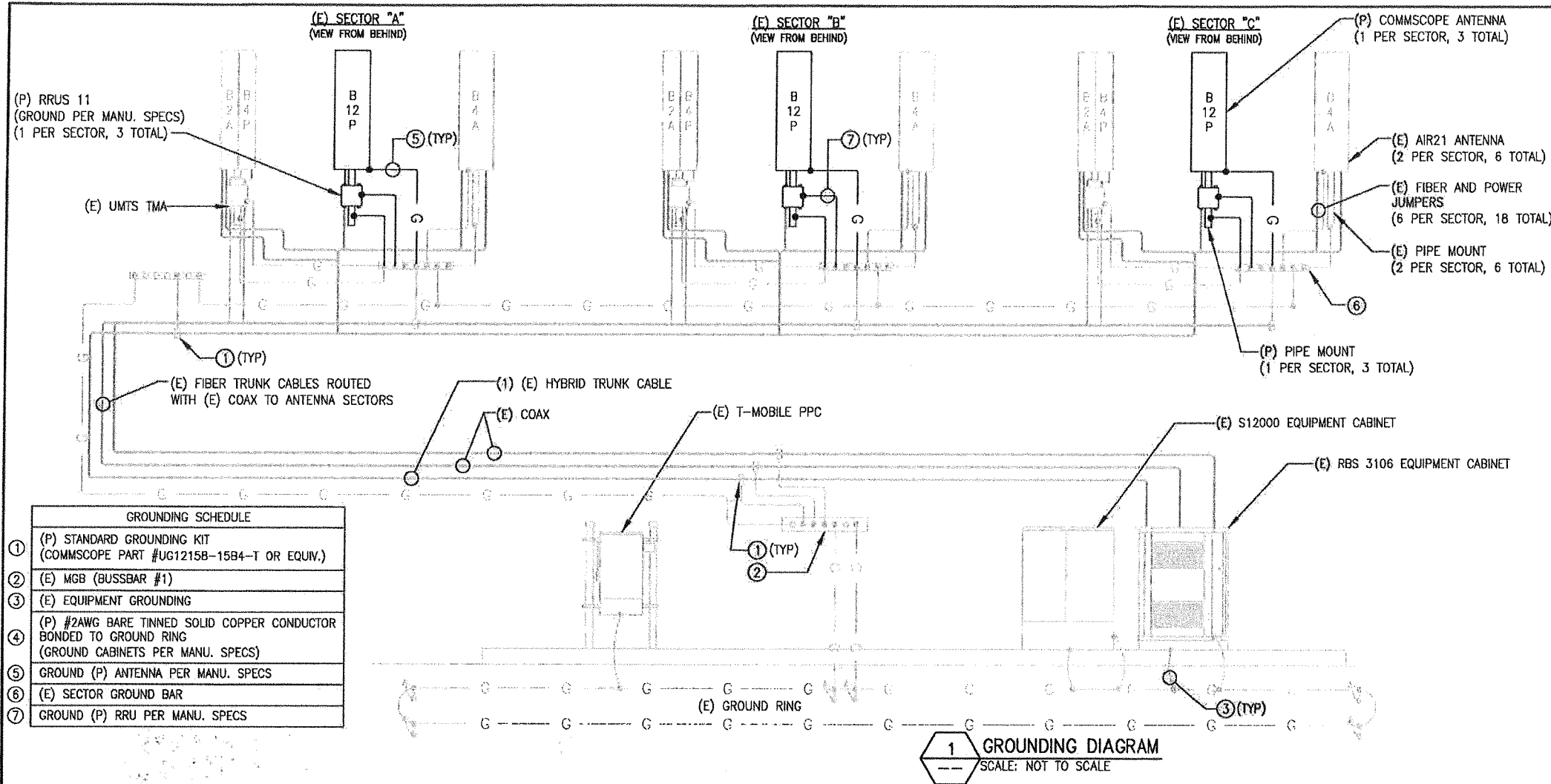
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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER: CT11491B  
 SITE NAME: CT491/SITE HARTFORD\_MP1  
 305 W. SERVICE RD  
 HARTFORD, CT 06120

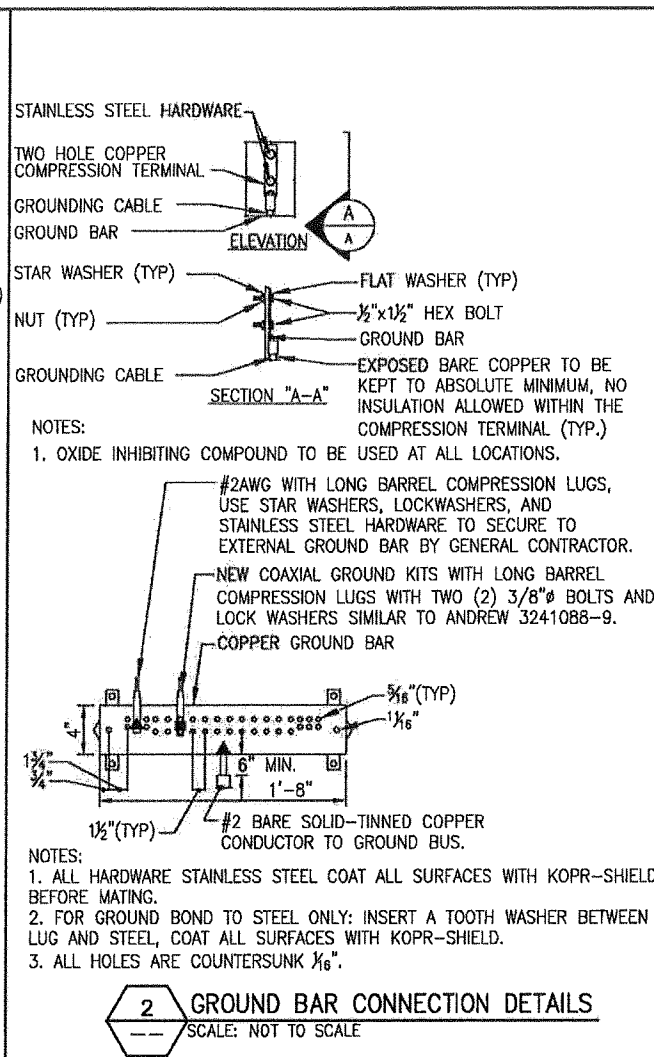
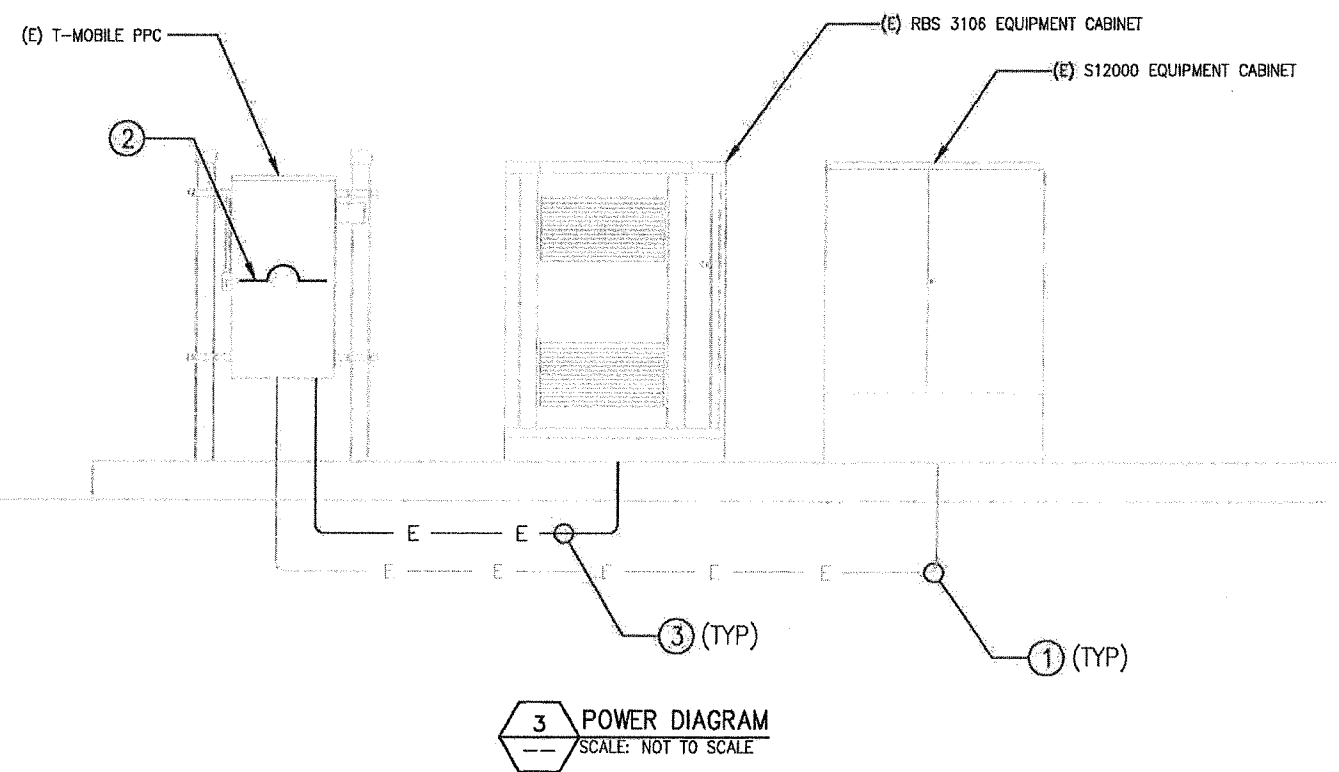
SHEET TITLE  
**GROUNDING & POWER DIAGRAMS**

SHEET NUMBER  
**E-1**  
 SHEET 6 OF 8 SHEETS



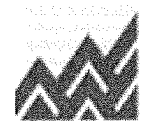
GROUNDING SCHEDULE	
①	(P) STANDARD GROUNDING KIT (COMMSCOPE PART #UG1215B-15B4-T OR EQUIV.)
②	(E) MGB (BUSSBAR #1)
③	(E) EQUIPMENT GROUNDING
④	(P) #2AWG BARE TINNED SOLID COPPER CONDUCTOR BONDED TO GROUND RING (GROUND CABINETS PER MANU. SPECS)
⑤	GROUND (P) ANTENNA PER MANU. SPECS
⑥	(E) SECTOR GROUND BAR
⑦	GROUND (P) RRU PER MANU. SPECS

CONDUIT SCHEDULE	
①	(P) WIRE AND CONDUIT UPGRADE FOR POWER
②	(P) 100A BREAKER UPGRADE
③	(P) POWER CONDUIT UPGRADE









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

T-Mobile Existing Facility

Site ID: CT11491B

CT491/ SSite Hartford\_MP1  
305 W. Service Road  
Hartford, CT 06120

**November 2, 2015**

**EBI Project Number: 6215005510**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>7.65 %</b>

November 2, 2015

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

Emissions Analysis for Site: **CT11491B – CT491/ SSite Hartford\_MP1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **305 W. Service Road, Hartford, 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 approximately 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 **305 W. Service Road, Hartford, 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 / 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
- 2) 2 UMTS channels (AWS Band – 2100 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 (AWS Band – 2100 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 **Ericsson AIR21 B4A/B2P & B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) 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 **Ericsson AIR21 B4A/B2P & B2A/B4P** have a maximum gain of **15.9 dBd** at their 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 **125 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:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	125	Height (AGL):	125	Height (AGL):	125
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.19	Antenna B1 MPE%	1.19	Antenna C1 MPE%	1.19
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	125	Height (AGL):	125	Height (AGL):	125
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.19	Antenna B2 MPE%	1.19	Antenna C2 MPE%	1.19
Antenna #:	3	Antenna #:	3	Antenna #:	3
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):	125	Height (AGL):	125	Height (AGL):	125
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 A3 MPE%	0.47	Antenna B3 MPE%	0.47	Antenna C3 MPE%	0.47

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	2.84 %
Northcoast	0.20 %
Nextel	0.25 %
Clearwire	0.23 %
Sunsus (CL&P)	0.12 %
Verizon Wireless	4.01 %
<b>Site Total MPE %:</b>	<b>7.65 %</b>

T-Mobile Sector 1 Total:	2.84 %
T-Mobile Sector 2 Total:	2.84 %
T-Mobile Sector 3 Total:	2.84 %
<b>Site Total:</b>	<b>7.65 %</b>

T-Mobile_per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	125	11.85	2100	1000	1.19 %
T-Mobile 1900 MHz (PCS) GSM/UMTS	2	1167.14	125	5.93	1900	1000	0.59 %
T-Mobile 2100 MHz (AWS) UMTS	2	1167.14	125	5.93	2100	1000	0.59 %
T-Mobile 700 MHz LTE	1	865.21	125	2.20	700	467	0.47 %
						<b>Total:</b>	<b>2.84 %</b>

## 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:	2.84 %
Sector 2:	2.84 %
Sector 3 :	2.84 %
T-Mobile Per Sector Maximum:	2.84 %
Site Total:	7.65 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **7.65%** 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



**AMERICAN TOWER®**  
CORPORATION

This report was prepared for American Tower Corporation by

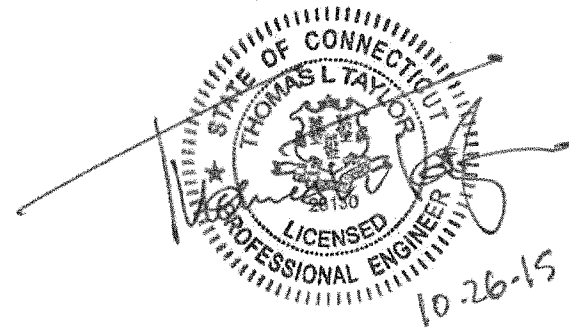


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## Structural Analysis Report

**Structure** : 147.9 ft Monopole  
**ATC Site Name** : West Service Road, CT  
**ATC Site Number** : 302466  
**Engineering Number** : 64006221  
**Proposed Carrier** : T-Mobile  
**Carrier Site Name** : N/A  
**Carrier Site Number** : CT11491B  
**Site Location** : 305 W Service Rd.  
Hartford, CT 06120-0001  
41.79954, -72.65669  
**County** : Hartford  
**Date** : October 26, 2015  
**Max Usage** : 63%  
**Result** : Pass

Kyle Klabunde  
SES Structural Engineer I





**AMERICAN TOWER®**  
CORPORATION

This report was prepared for American Tower Corporation by



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Kyle Klabunde  
SES Structural Engineer I



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**Introduction**

The purpose of this report is to summarize results of a structural analysis performed on the 147.9 ft monopole to reflect the change in loading by T-Mobile.

**Supporting Documents**

<b>Tower Drawings</b>	FWT Job #18053, dated September 10, 1998
<b>Foundation Drawing</b>	FWT Job #18054, dated September 10, 1998
<b>Geotechnical Report</b>	Gibble Norden Champion Project #98134.09, dated September 8, 1998

**Analysis**

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	95 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	C
<b>Topographic Category:</b>	1
<b>Spectral Response:</b>	$S_s = 0.18, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

**Conclusion**

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
148.0	148.0	8	Andrew DB844H90E-XY	Platform w/ Handrails	(12) 1 5/8" Coax	Sprint Nextel
		4	Andrew 844G65VTZASX			
133.0	135.0	9	48" x 4" Panel	Low Profile Platform	(9) 1 5/8" Coax	AT&T Mobility
125.0	125.0	3	Ericsson KRY 112 144/1	T-Arms	(12) 1 5/8" Coax (1) 1 5/8" Fiber	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21, 1.3M, B4A B2P			
115.0	115.0	6	Antel BXA-70063-6CF-EDIN-X	Low Profile Platform	(18) 1 5/8" Coax (1) 1 5/8" Hybriflex	Verizon Wireless
		3	Alcatel-Lucent RRH2x40-AWS			
		6	Antel BXA-171063-12CF-EDIN-X			
		1	RFS DB-T1-6Z-8AB-0Z			
97.0	105.0	1	Antel BCD-87010 25	Stand-Off	(1) 7/8" Coax	Sensus USA, Inc.
90.0	90.0	2	DragonWave Horizon Compact	Leg	(6) 5/16" Coax (2) 2" Conduit (2) 1/2" Coax	Clearwire Corporation
	88.0	3	NextNet BTS-2500			
		3	Argus LLPX310R			
		2	DragonWave A-ANT-18G-2-C			

**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
No loading considered as to be removed						

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
125.0	125.0	3	Ericsson RRUS 11 B12	Existing T-Arms	-	T-Mobile
		3	Andrew LNX-6515DS-VTM			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	61%	Pass
Shaft	63%	Pass
Base Plate	41%	Pass

**Foundations**

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	3,969.0	5,358.2	3,124.5	58%
Shear (Kips)	29.4	39.7	30.5	77%

\* The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
125.0	Ericsson RRUS 11 B12	T-Mobile	1.028	0.848
	Andrew LNX-6515DS-VTM			
90.0	DragonWave A-ANT-18G-2-C	Clearwire Corporation	0.554	0.682

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



### Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



# 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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

November 11, 2015

Craig Cody  
Tower Resource Management, Inc.  
16 Chestnut Street  
Suite 421  
Foxboro, MA 02035

RE: **EM-T-MOBILE-064-151105** - T-Mobile notice of intent to modify an existing telecommunications facility located at 305 West Service Road, Hartford, Connecticut.

Dear Mr. Cody:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on November 5, 2015.

According to Section 16-50j-73 of the Regulations of Connecticut State Agencies, "...the owner or operator of any tower and associated equipment claiming such tower and associated equipment is exempt pursuant to section 16-50j-72 of the Regulations of Connecticut State Agencies shall give the Council, the property owner of record, if the property owner of record is different from the owner or operator of the tower and associated equipment, and the chief elected official of the municipality in which the facility is to be located, notice in writing prior to construction."

Council staff has identified the following discrepancy:

- The chief elected official of the municipality in which the facility is located must be a recipient of the exempt modification notice. Currently, only the City of Hartford is mentioned.

Therefore, the notice of intent to modify an existing telecommunications facility is incomplete at this time. This notice of incompleteness shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

The Council recommends that T-Mobile provide information to clarify or fulfill the deficiency noted above.

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Very truly yours,

Melanie Bachman  
Acting Executive Director

MAB/CH

- c: The Honorable Pedro E. Segarra, Mayor, City of Hartford  
Darrell V. Hill, Chief Operating Officer, City of Hartford  
Khara Dodds, Planning Division Director, City of Hartford





CRAIG CODY

16 Chestnut Street, Suite 420  
Foxboro, MA 02035  
Tel (781) 831-1281  
Fax (774) 215-5423

Melanie Bachman  
Executive Director  
Connecticut Siting Counsel  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – 305 W. Service Road, Hartford, CT**

Dear Ms. Bachman:

Please accept this letter as notification pursuant to R.C.S.A Section 16-50j-73, for construction that constitutes modification pursuant to R.C.S.A Section 16-50j-72(b) and 16-50j-73. In accordance with R.C.S.A Section 16-50j-73, a copy of this submission is being sent to the City of Hartford. A copy of this submission is also being sent to West Service Road Association, LLC., the property owner on which the tower is located.

### **T-Mobile Northeast LLC's Proposed Wireless Modifications**

T-Mobile as successor in interest to Omnipoint Communications achieved an initial approval from the Siting Council to install antennas as well as related ground equipment and currently maintains this equipment. The facility consists of a One-Hundred and Fifty-Three (153') foot high communications tower within a fenced in compound. T-Mobile now intends to modify the facility as shown on the enclosed plans prepared by Infinigy Engineering and annexed hereto in Exhibit 1. The modifications will consist of adding three (3) new antennas at the existing AGL of One-Hundred and Twenty-Five feet (125'). A structural analysis has been completed for the site and attached as Exhibit 3.

### **T-Mobile's Proposed Wireless Modifications Constitutes An "Exempt Modification"**

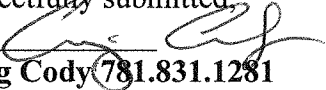
The proposed modification to the above mentioned Facility constitutes an exempt modification of an existing facility provided for in R.C.S.A Section 16-50j-72(b)(2) and Council regulations promulgated pursuant thereto.

- 1) The proposed modification will not result in an increase in the height of the existing tower.
- 2) The modifications will remain entirely within the limits of the leased area. The modifications therefor, will not require the extension of the boundary.

- 3) The proposed modification does not increase the noise levels at the boundary by six(6) decibels or more under normal conditions.
- 4) T-Mobile's proposed facility will not increase the cumulative radio frequency electromagnetic radiation power density at the Tower sites' boundary to or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. A cumulative General Power Density table for T-Mobile's proposed modified facility is included as Exhibit 2.
- 5) The facility has received all municipal zoning approvals and building permits. (Regs., Conn. State Agencies Section 16-50j-72))

For all the foregoing reasons, T-Mobile Northeast LLC respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A Section 16-50j-72(b)(2)

Respectfully submitted,



**Craig Cody (781.831.1281)**

On behalf of American Tower Corporation  
c/o Tower Resource Management, Inc.  
16 Chestnut Street, Suite 420  
Foxboro, MA 02035

cc: **Pedro Segarra, Chief Elected Official City of Hartford**  
**American Tower Corporation**  
**West Service Road Association, LLC**

Exhibit 1

Site Plan

Exhibit 2

Power Density Report

Exhibit 3

Structural Analysis









RF SYSTEM SCHEDULE (702Cu CONFIGURATION)

SECTOR	TECHNOLOGY	ANTENNA PORT	BAND	ANTENNA MODEL #	VENDOR	QTY (REMOVED)	QTY (NEW)	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA MODEL #	VENDOR	RRU MODEL #	VENDOR	CABLE LENGTH	CABLE DIAMETER	CABLE TYPE	CABLE MODEL #	VENDOR	CABLE TAGGING	COLOR CODING	JUMPER TYPE	JUMPER TAGGING	COLOR CODING			
A	UMTS AWS	RF #1	B4P	AIR21 B4P/B2A	ERICSSON	0	0	140°	0°	4°	125°-0°	(EXISTING) KRY 112 144/1	ERICSSON	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A1	-	COAX	-	-			
		RF #2										-				-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-		
	GSM	OPTICAL #1	B2A									-				-	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-
	UMTS PCS	OPTICAL #2										-				-	-	-	-	-	-	-	-	-	-	-		
	LTE 700	TBD	B12P									LNX-6515DS-VTM				COMMSCOPE	0	1	140°	0°	2°	125°-0°	-	-	(PROPOSED) RRUS 11	ERICSSON	(ANTENNA CONNECTED VIA EXISTING HYBRID CABLE.)	
LTE AWS	OPTICAL #1	B4A	AIR21 B4A/B2P	ERICSSON	0	0	140°	0°	4°	125°-0°	-	-	-	-	(ANTENNA CONNECTED VIA EXISTING HYBRID CABLE.)					FIBER	-	-						
B	UMTS AWS	RF #1	B4P	AIR21 B4P/B2A	ERICSSON	0	0	250°	0°	2°	125°-0°	(EXISTING) KRY 112 144/1	ERICSSON	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A1	-	COAX	-	-			
		RF #2										-				-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-		
	GSM	OPTICAL #1	B2A									-				-	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-
	UMTS PCS	OPTICAL #2										-				-	-	-	-	-	-	-	-	-	-			
	LTE 700	TBD	B12P									LNX-6515DS-VTM				COMMSCOPE	0	1	250°	0°	2°	125°-0°	-	-	(PROPOSED) RRUS 11	ERICSSON	(ANTENNA CONNECTED VIA EXISTING HYBRID CABLE.)	
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C	UMTS AWS	RF #1	B4P	AIR21 B4P/B2A	ERICSSON	0	0	350°	0°	2°	125°-0°	(EXISTING) KRY 112 144/1	ERICSSON	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A1	-	COAX	-	-			
		RF #2										-				-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-		
	GSM	OPTICAL #1	B2A									-				-	-	-	EXISTING	1 5/8"	COAX	EXISTING	N/A	UMTS AWS A2	-	COAX	-	-
	UMTS PCS	OPTICAL #2										-				-	-	-	-	-	-	-	-	-	-			
	LTE 700	TBD	B12P									LNX-6515DS-VTM				COMMSCOPE	0	1	350°	0°	2°	125°-0°	-	-	(PROPOSED) RRUS 11	ERICSSON	(ANTENNA CONNECTED VIA EXISTING HYBRID CABLE.)	
LTE AWS	OPTICAL #1	B4A	AIR21 B4A/B2P	ERICSSON	0	0	350°	0°	2°	125°-0°	-	-	-	-	(ANTENNA CONNECTED VIA EXISTING HYBRID CABLE.)					FIBER	-	-						

**KEY**

EXISTING	R - RED - GSM
PROPOSED	G - GREEN - UMTS 1900
FIBER CONNECTION	B - BLUE - UMTS AWS
	Y - YELLOW - LTE
	O - ORANGE - FIBER CABLE

1 RF SCHEDULE  
NOT TO SCALE

**SUBMITTALS**

DATE	DESCRIPTION	REVISION
10/02/15	FOR PERMIT	0
11/30/15	REVISED FOR PERMIT	1

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
DPS			
CONSTR.			
SITE AC.			

PROJECT NO: 317-000  
DRAWN BY: MAP  
CHECKED BY: ASW



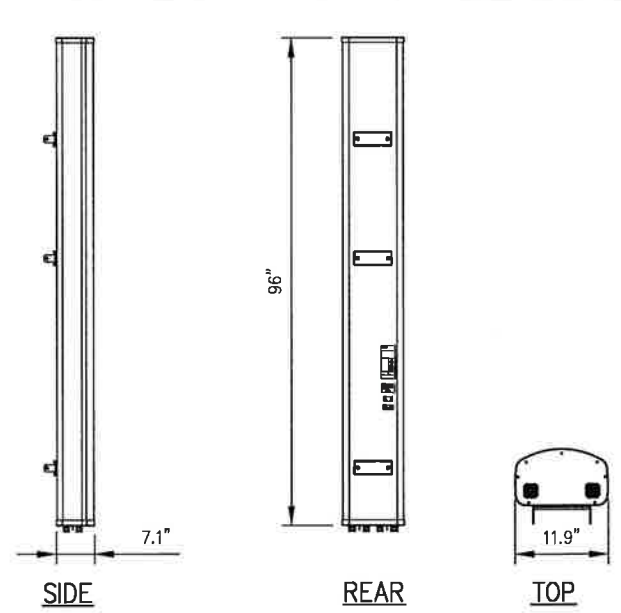
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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

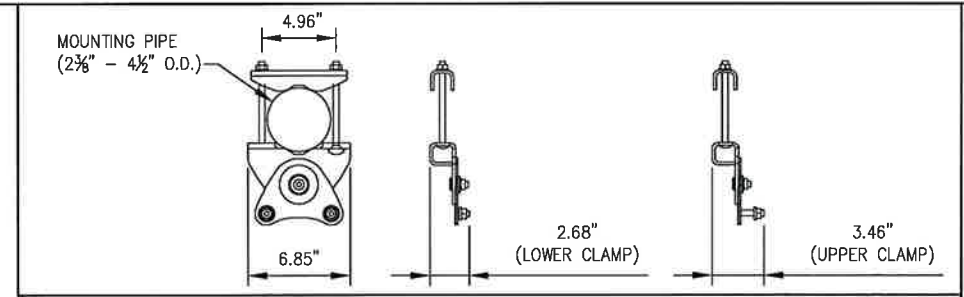
SITE NUMBER: CT11491B  
SITE NAME: CT491/SSITE HARTFORD\_MP1  
305 W. SERVICE RD  
HARTFORD, CT 06120

SHEET TITLE  
**ANTENNA DETAIL & RF SCHEDULE**

SHEET NUMBER  
**C-3**  
SHEET 4 OF 8 SHEETS

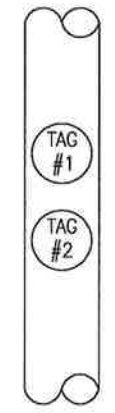


2 ANTENNA DETAIL  
NOT TO SCALE



COMMSCOPE MODEL NO.: LNX-6515DS-VTM

RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	96"x11.9"x7.1" (2438 x 301 x 181 mm)
WEIGHT, W/ PRE-MOUNTED BRACKETS:	43.7 LBS
CONNECTOR:	7-16 DIN FEMALE



3 METALLIC TAG DETAIL  
NOT TO SCALE

- METALLIC TAG NOTES:**
- TWO METALLIC TAGS SHALL BE ATTACHED AT EACH END OF EVERY CABLE LONGER THAN (3) THREE FEET.
  - CABLES LESS THAN (3) THREE FEET WILL HAVE TWO METALLIC TAGS ATTACHED AT THE CENTER OF THE CABLE.
  - TAGS WILL BE FASTENED WITH STAINLESS STEEL ZIP TIES APPROPRIATE FOR CABLE DIAMETER.
  - STANDARDIZED METALLIC TAG KITS WILL BE ASSEMBLED WITH TAGS ALREADY ENGRAVED TO ACCOMMODATE ALL CONFIGURATIONS.













CRAIG CODY

16 Chestnut Street, Suite 421  
Foxboro, MA 02035  
Tel (781) 831-1281  
Fax (774) 215-5423

Melanie Bachman  
Executive Director  
Connecticut Siting Counsel  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – 305 W. Service Road, Hartford, CT**

Dear Ms. Bachman:

Please accept this letter as notification pursuant to R.C.S.A Section 16-50j-73, for construction that constitutes modification pursuant to R.C.S.A Section 16-50j-72(b) and 16-50j-73. In accordance with R.C.S.A Section 16-50j-73, a copy of this submission is being sent to the City of Hartford. A copy of this submission is also being sent to West Service Road Association, LLC., the property owner on which the tower is located.

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**T-Mobile's Proposed Wireless Modifications Constitutes An "Exempt Modification"**

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For all the foregoing reasons, T-Mobile Northeast LLC respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A Section 16-50j-72(b)(2)

Respectfully submitted,

  
**Craig Cody 781.831.1281**

On behalf of American Tower Corporation  
c/o Tower Resource Management, Inc.  
16 Chestnut Street, Suite 421  
Foxboro, MA 02035

cc: **City of Hartford**  
**West Service Road Association, LLC**

Exhibit 1

Site Plan



Exhibit 2  
Power Density Report

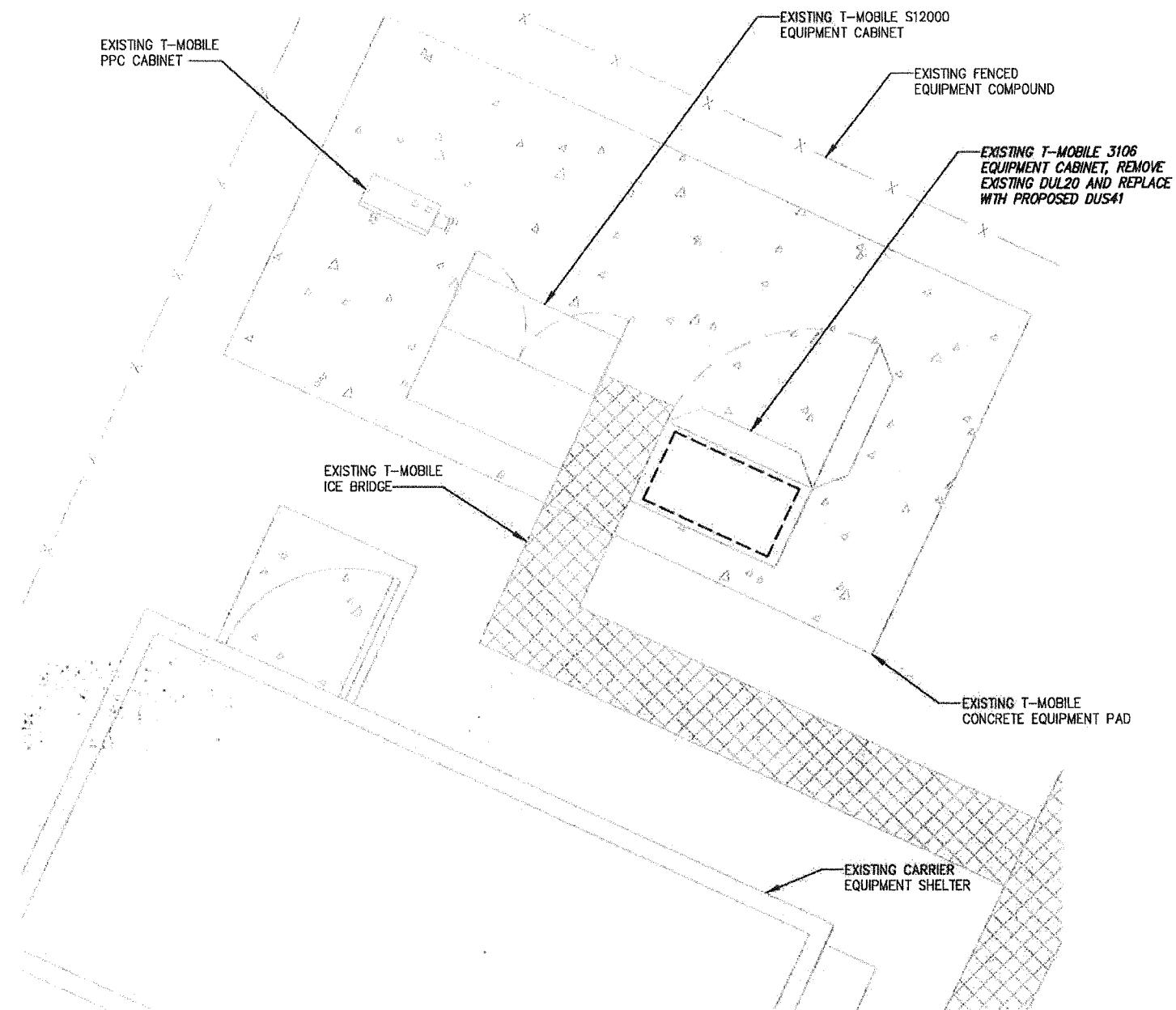
Exhibit 3

Structural Analysis



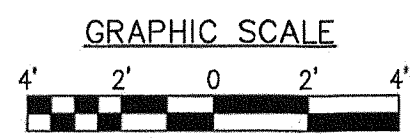






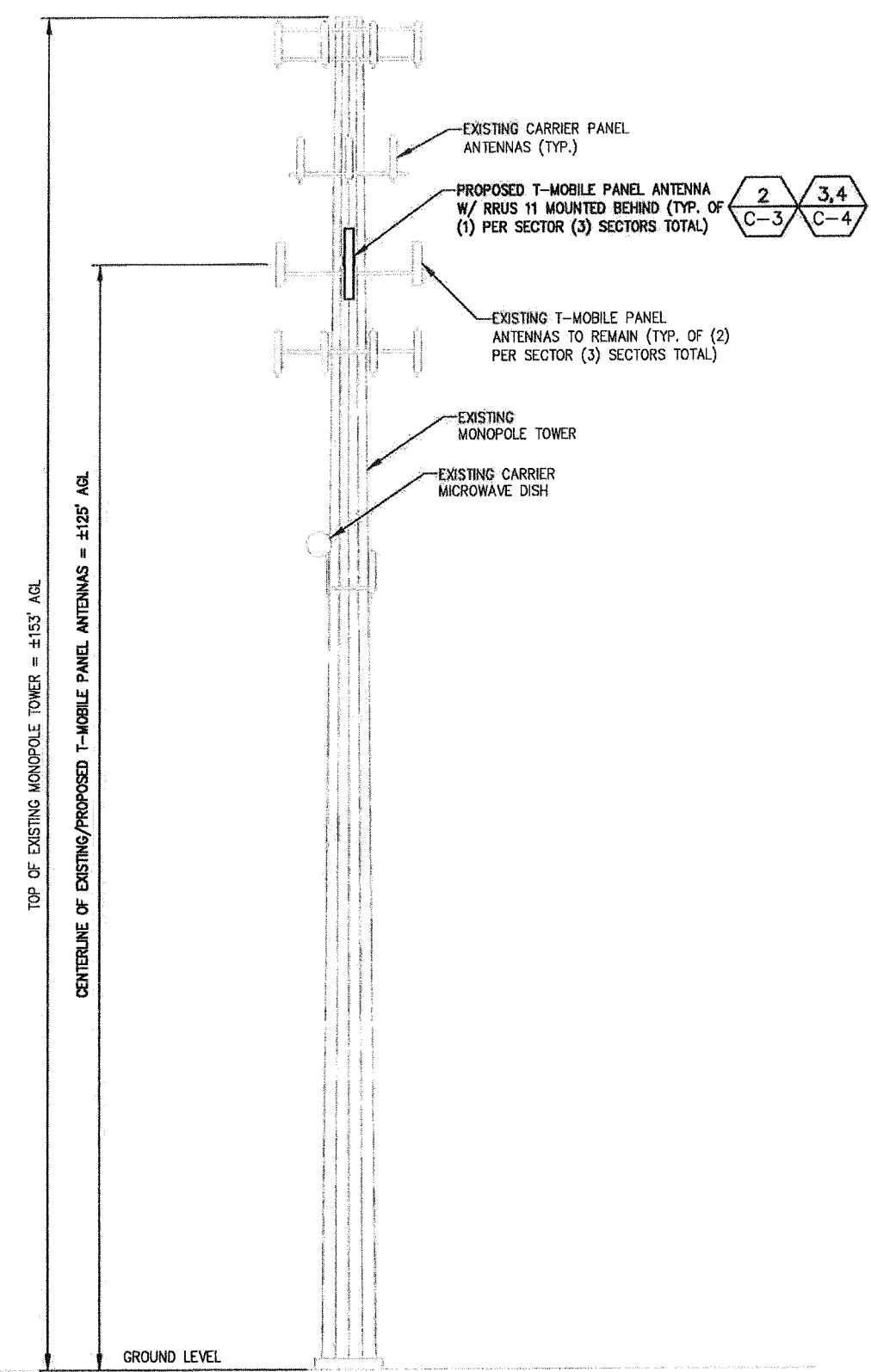
CALLLED NORTH

1 COMPOUND PLAN  
SCALE: AS NOTED

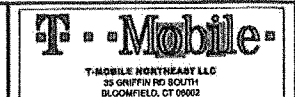


SCALE (11x17): 1" = 4'-0"  
SCALE (22x34): 1" = 2'-0"

NOTE:  
INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER OR LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSIS.



2 TOWER ELEVATION  
NOT TO SCALE



T-MOBILE NORTHEAST LLC  
35 GRIFFIN RD SOUTH  
BLOOMFIELD, CT 06002

INFINIGY

1033 Westervillet Shaker Rd  
Albany, NY 12205  
Office # (518) 880-0780  
Fax # (518) 880-0783

SUBMITTALS		
DATE	DESCRIPTION	REVISION
10/02/15	FOR PERMIT	e

DEPT	DATE	APP'D	REVISIONS
RFE			
RF MAN			
ZONING			
OPS			
CONSTR			
SITE AC			

PROJECT NO: 317-000  
DRAWN BY: MAP  
CHECKED BY: ASW



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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:  
CT11491B  
SITE NAME:  
CT491/SSITE HARTFORD\_MP1  
305 W. SERVICE RD  
HARTFORD, CT 06120

SHEET TITLE  
**COMPOUND PLAN & ELEVATION**

SHEET NUMBER  
**C-2**  
SHEET 3 OF 8 SHEETS



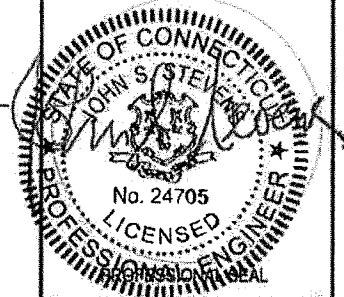




SUBMITTALS		
DATE	DESCRIPTION	REVISION
10/02/15	FOR PERMIT	0

DEPT.	DATE	APP'D	REVISIONS
RF			
RF MAIL			
TRAINING			
OPS			
CONTR.			
SITE AC.			

PROJECT NO: 317-000  
 DRAWN BY: MAP  
 CHECKED BY: ASW



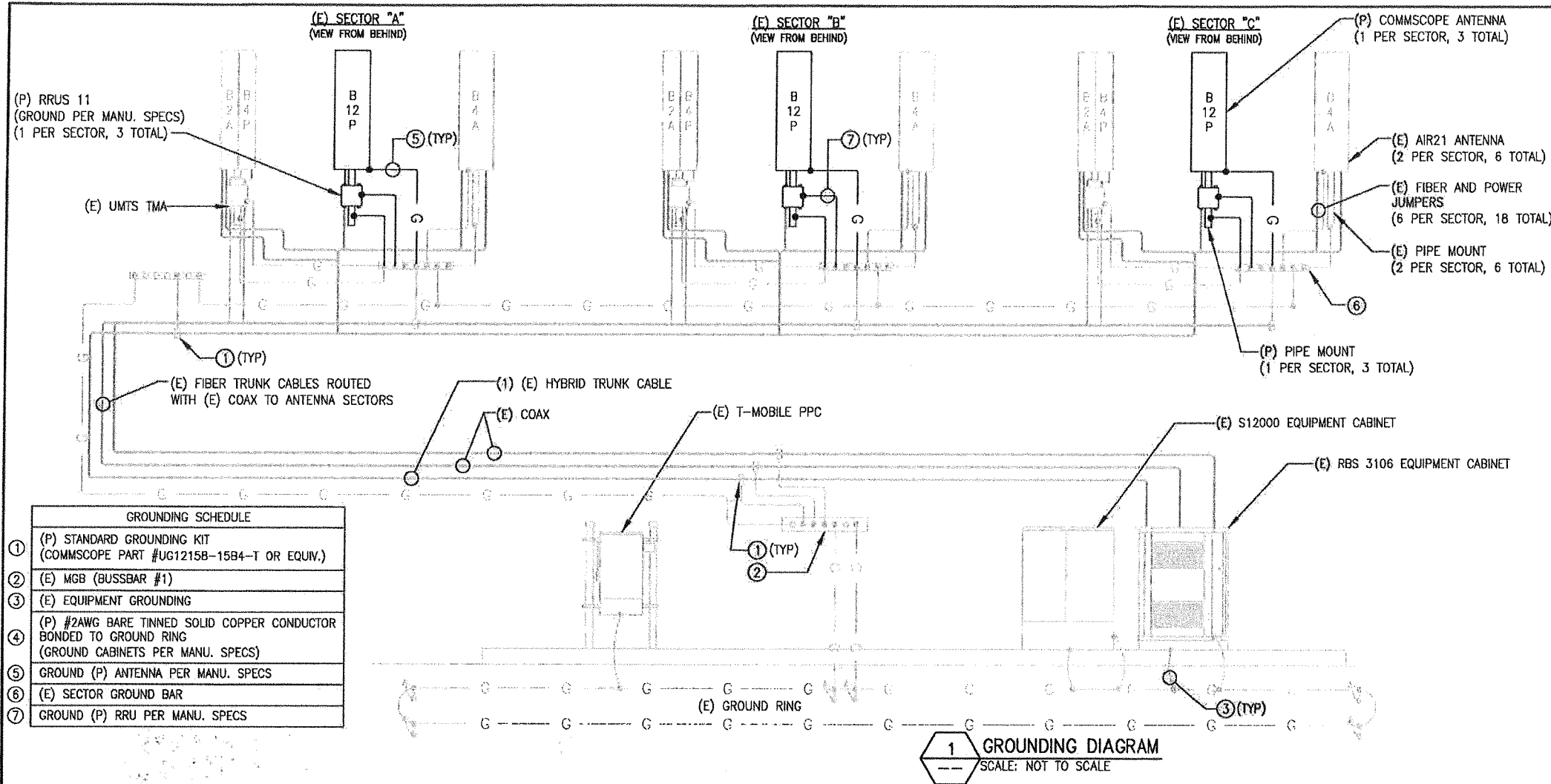
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NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER: CT11491B  
 SITE NAME: CT491/SITE HARTFORD\_MP1  
 305 W. SERVICE RD  
 HARTFORD, CT 06120

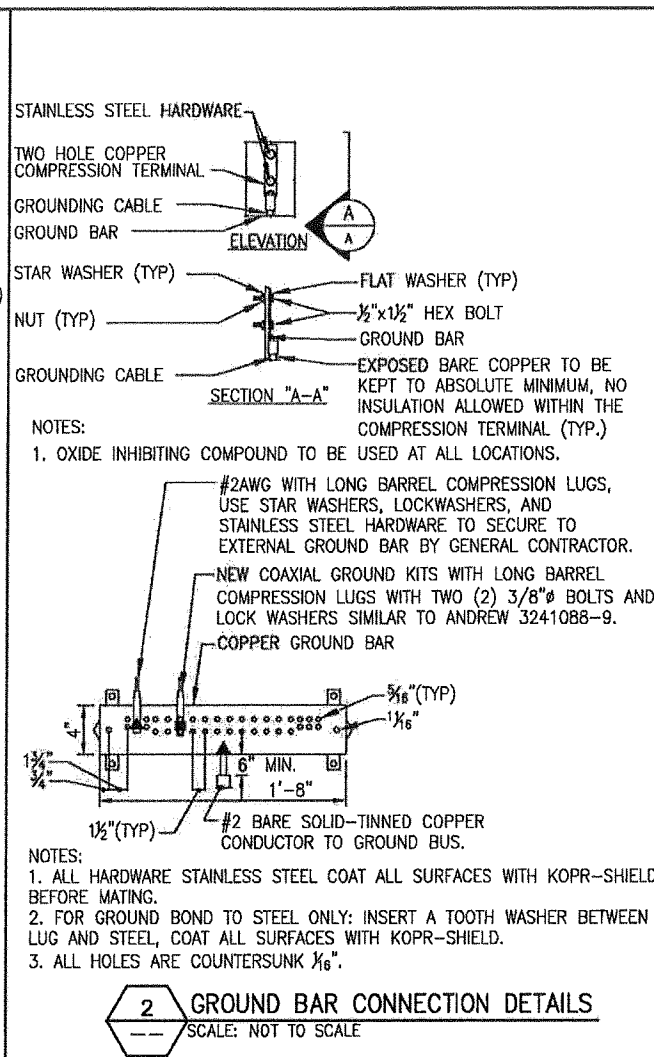
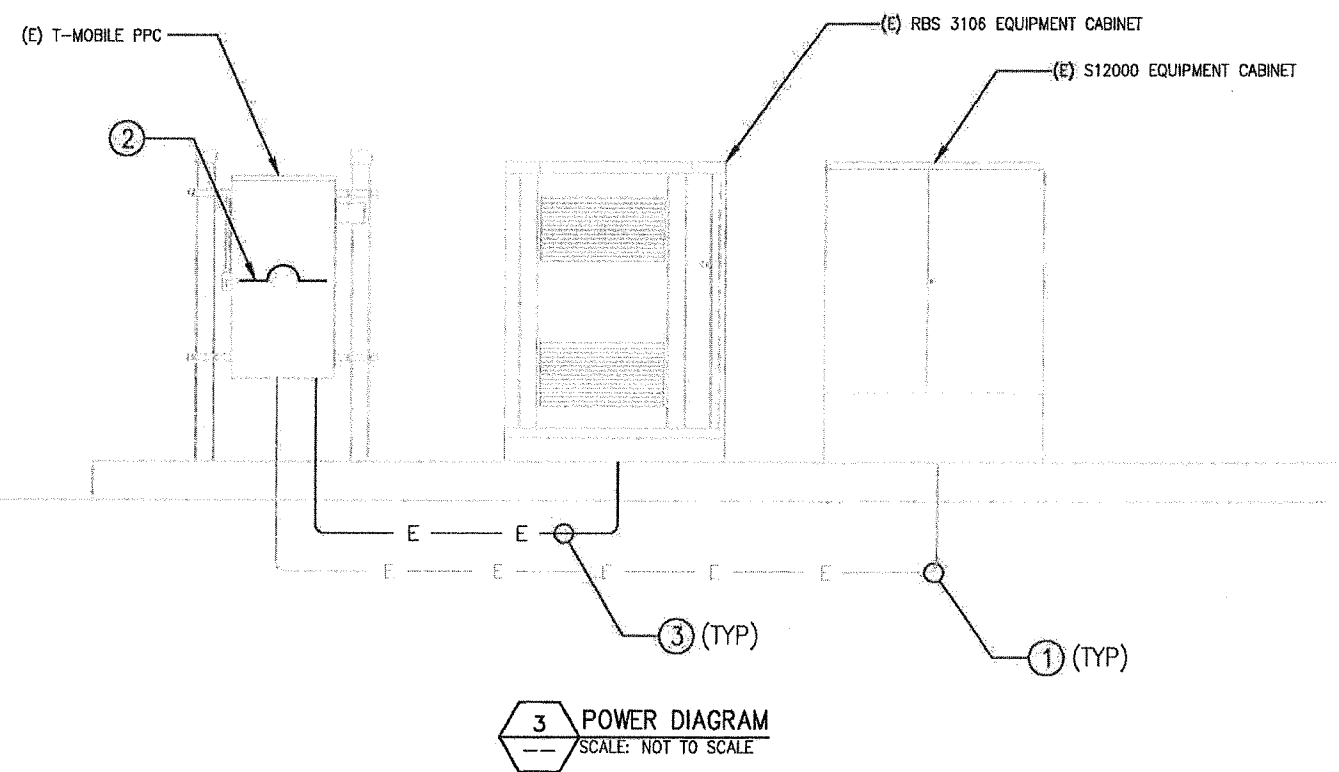
SHEET TITLE  
**GROUNDING & POWER DIAGRAMS**

SHEET NUMBER  
**E-1**  
 SHEET 6 OF 8 SHEETS



GROUNDING SCHEDULE	
①	(P) STANDARD GROUNDING KIT (COMMSCOPE PART #UG1215B-15B4-T OR EQUIV.)
②	(E) MGB (BUSSBAR #1)
③	(E) EQUIPMENT GROUNDING
④	(P) #2AWG BARE TINNED SOLID COPPER CONDUCTOR BONDED TO GROUND RING (GROUND CABINETS PER MANU. SPECS)
⑤	GROUND (P) ANTENNA PER MANU. SPECS
⑥	(E) SECTOR GROUND BAR
⑦	GROUND (P) RRU PER MANU. SPECS

CONDUIT SCHEDULE	
①	(P) WIRE AND CONDUIT UPGRADE FOR POWER
②	(P) 100A BREAKER UPGRADE
③	(P) POWER CONDUIT UPGRADE



STAINLESS STEEL HARDWARE  
 TWO HOLE COPPER COMPRESSION TERMINAL  
 GROUNDING CABLE  
 GROUND BAR  
 STAR WASHER (TYP)  
 NUT (TYP)  
 GROUNDING CABLE  
 SECTION "A-A"

(P) COMMSCOPE ANTENNA (1 PER SECTOR, 3 TOTAL)  
 (E) AIR21 ANTENNA (2 PER SECTOR, 6 TOTAL)  
 (E) FIBER AND POWER JUMPERS (6 PER SECTOR, 18 TOTAL)  
 (E) PIPE MOUNT (2 PER SECTOR, 6 TOTAL)  
 (P) PIPE MOUNT (1 PER SECTOR, 3 TOTAL)

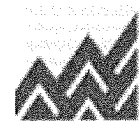
FLAT WASHER (TYP)  
 $\frac{1}{2}$ "x $\frac{1}{2}$ " HEX BOLT  
 GROUND BAR  
 EXPOSED BARE COPPER TO BE KEPT TO ABSOLUTE MINIMUM, NO INSULATION ALLOWED WITHIN THE COMPRESSION TERMINAL (TYP.)

NOTES:  
 1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

#2AWG WITH LONG BARREL COMPRESSION LUGS, USE STAR WASHERS, LOCKWASHERS, AND STAINLESS STEEL HARDWARE TO SECURE TO EXTERNAL GROUND BAR BY GENERAL CONTRACTOR.  
 NEW COAXIAL GROUND KITS WITH LONG BARREL COMPRESSION LUGS WITH TWO (2)  $\frac{3}{8}$ " $\phi$  BOLTS AND LOCK WASHERS SIMILAR TO ANDREW 324-10B8-9.  
 COPPER GROUND BAR  
 $\frac{1}{16}$ " (TYP)  
 $\frac{1}{16}$ "  
 6" MIN.  
 1'-8"  
 #2 BARE SOLID-TINNED COPPER CONDUCTOR TO GROUND BUS.







---

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

T-Mobile Existing Facility

Site ID: CT11491B

CT491/ SSite Hartford\_MP1  
305 W. Service Road  
Hartford, CT 06120

**November 2, 2015**

**EBI Project Number: 6215005510**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>7.65 %</b>

November 2, 2015

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

Emissions Analysis for Site: **CT11491B – CT491/ SSite Hartford\_MP1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **305 W. Service Road, Hartford, 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 approximately 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 **305 W. Service Road, Hartford, 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 / 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
- 2) 2 UMTS channels (AWS Band – 2100 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 (AWS Band – 2100 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 **Ericsson AIR21 B4A/B2P & B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) 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 **Ericsson AIR21 B4A/B2P & B2A/B4P** have a maximum gain of **15.9 dBd** at their 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 **125 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:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	125	Height (AGL):	125	Height (AGL):	125
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.19	Antenna B1 MPE%	1.19	Antenna C1 MPE%	1.19
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	125	Height (AGL):	125	Height (AGL):	125
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.19	Antenna B2 MPE%	1.19	Antenna C2 MPE%	1.19
Antenna #:	3	Antenna #:	3	Antenna #:	3
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):	125	Height (AGL):	125	Height (AGL):	125
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 A3 MPE%	0.47	Antenna B3 MPE%	0.47	Antenna C3 MPE%	0.47

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	2.84 %
Northcoast	0.20 %
Nextel	0.25 %
Clearwire	0.23 %
Sunsus (CL&P)	0.12 %
Verizon Wireless	4.01 %
<b>Site Total MPE %:</b>	<b>7.65 %</b>

T-Mobile Sector 1 Total:	2.84 %
T-Mobile Sector 2 Total:	2.84 %
T-Mobile Sector 3 Total:	2.84 %
<b>Site Total:</b>	<b>7.65 %</b>

T-Mobile_per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	125	11.85	2100	1000	1.19 %
T-Mobile 1900 MHz (PCS) GSM/UMTS	2	1167.14	125	5.93	1900	1000	0.59 %
T-Mobile 2100 MHz (AWS) UMTS	2	1167.14	125	5.93	2100	1000	0.59 %
T-Mobile 700 MHz LTE	1	865.21	125	2.20	700	467	0.47 %
						<b>Total:</b>	<b>2.84 %</b>

## Summary

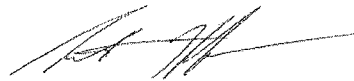
All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

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:	2.84 %
Sector 2:	2.84 %
Sector 3 :	2.84 %
T-Mobile Per Sector Maximum:	2.84 %
Site Total:	7.65 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **7.65%** 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.



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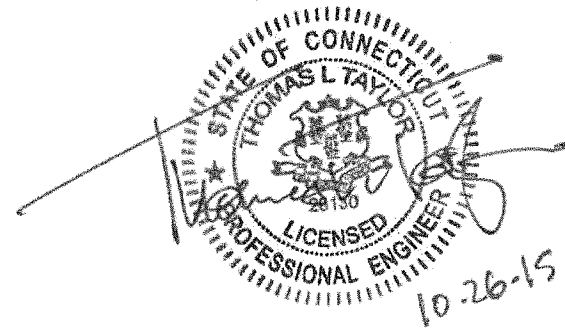


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## Structural Analysis Report

**Structure** : 147.9 ft Monopole  
**ATC Site Name** : West Service Road, CT  
**ATC Site Number** : 302466  
**Engineering Number** : 64006221  
**Proposed Carrier** : T-Mobile  
**Carrier Site Name** : N/A  
**Carrier Site Number** : CT11491B  
**Site Location** : 305 W Service Rd.  
Hartford, CT 06120-0001  
41.79954, -72.65669  
**County** : Hartford  
**Date** : October 26, 2015  
**Max Usage** : 63%  
**Result** : Pass

Kyle Klabunde  
SES Structural Engineer I





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Kyle Klabunde  
SES Structural Engineer I



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### Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 147.9 ft monopole to reflect the change in loading by T-Mobile.

### Supporting Documents

<b>Tower Drawings</b>	FWT Job #18053, dated September 10, 1998
<b>Foundation Drawing</b>	FWT Job #18054, dated September 10, 1998
<b>Geotechnical Report</b>	Gibble Norden Champion Project #98134.09, dated September 8, 1998

### Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	95 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	C
<b>Topographic Category:</b>	1
<b>Spectral Response:</b>	$S_s = 0.18, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

### Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
148.0	148.0	8	Andrew DB844H90E-XY	Platform w/ Handrails	(12) 1 5/8" Coax	Sprint Nextel
		4	Andrew 844G65VTZASX			
133.0	135.0	9	48" x 4" Panel	Low Profile Platform	(9) 1 5/8" Coax	AT&T Mobility
125.0	125.0	3	Ericsson KRY 112 144/1	T-Arms	(12) 1 5/8" Coax (1) 1 5/8" Fiber	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21, 1.3M, B4A B2P			
115.0	115.0	6	Antel BXA-70063-6CF-EDIN-X	Low Profile Platform	(18) 1 5/8" Coax (1) 1 5/8" Hybriflex	Verizon Wireless
		3	Alcatel-Lucent RRH2x40-AWS			
		6	Antel BXA-171063-12CF-EDIN-X			
		1	RFS DB-T1-6Z-8AB-0Z			
97.0	105.0	1	Antel BCD-87010 25	Stand-Off	(1) 7/8" Coax	Sensus USA, Inc.
90.0	90.0	2	DragonWave Horizon Compact	Leg	(6) 5/16" Coax (2) 2" Conduit (2) 1/2" Coax	Clearwire Corporation
	88.0	3	NextNet BTS-2500			
		3	Argus LLPX310R			
		2	DragonWave A-ANT-18G-2-C			

**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
No loading considered as to be removed						

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
125.0	125.0	3	Ericsson RRUS 11 B12	Existing T-Arms	-	T-Mobile
		3	Andrew LNX-6515DS-VTM			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	61%	Pass
Shaft	63%	Pass
Base Plate	41%	Pass

**Foundations**

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	3,969.0	5,358.2	3,124.5	58%
Shear (Kips)	29.4	39.7	30.5	77%

\* The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
125.0	Ericsson RRUS 11 B12	T-Mobile	1.028	0.848
	Andrew LNX-6515DS-VTM			
90.0	DragonWave A-ANT-18G-2-C	Clearwire Corporation	0.554	0.682

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



### Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.