NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

October 19, 2017

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

RE: Exempt Modification Application
293 Elm Street, Enfield CT 06082
Latitude: 41.997659
Longitude: -72.552918
T-Mobile Site#: CTHA029A-MWAAV

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 160-foot lattice tower located at 293 Elm Street, Enfield CT 06082. T-Mobile currently has approval for nine (9) antennas at the 140-foot level of the existing 160-foot tower. The property and tower are owned by The Town of Enfield. T-Mobile now intends to install one (1) IBR1300 Dish. The new dish would be installed at the 143.5-foot and level of the tower.

Planned Modifications:
Remove:
NONE

Remove and Replace:
NONE

Install New:
(1)IBR1300 Dish
(1)Fiber line
(2)CAT6 Cables

Existing to Remain:
(1) Hybrid line
(3) RRU
(3) AIR32 Antenna – 1900/2100 Mhz
(3) LNX6515 Antenna – 700 Mhz
(3) APX16 Antenna – 1900/2100 Mhz

This facility was approved by the Town of Enfield PZC. The PZ approved to replace the existing 120-foot tower and replace it with 160-foot tower. Please see attached.

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent Mayor Scott R. Kaupin, Elected Official and Roger J. O'Brien, Director of Planning for the Town of Enfield, as well as the property owner and the tower owner (Town of Enfield).

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site. ·

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments
cc: Mayor Scott R. Kaupin - as elected official
Roger J. O'Brien, Director of Planning
Town of Enfield - as tower owner and property owner

Exhibit A

INSTR # 2010001379
VOL 02495 PG 0832 09/03/2009 09:49:15 AM
RECORDED IN ENFIELD CT LAND RECORDS
SUZANNE F. OLECHNICKI TOWN CLERK

ZONING CERTIFICATE

- SPECIAL USE PERMIT -

Planning and Zoning File: XSU #09-06

OWNERS OF RECORD (Grantors) Town of Enfield

PREMISES: 293 Elm Street; Assessors Map 75, Lot 103

I, Peter Falk, Secretary, hereby certify that on July 23, 2009, the Planning and Zoning Commission of the Town of Enfield did approve XSU #09-06 – Special Use Permit to replace an existing 120' high communications antenna with a 160' high antenna at the Public Safety Complex located at 293 Elm Street, in an I-1 District, Assessors Map 75, Lot 103, Town of Enfield applicant/owner. This approval is subject to conformance with the submitted plans and the following conditions:

Conditions to be met prior to the issuance of permits:

1. This approval will become effective upon the filing of a Special Use Zoning Certificate signed by the Commission Secretary in the office of the Town Clerk. Proof of such filing shall be in the file prior to the issuance of any permits.

General Conditions:

2. This approval is for the specific use and structures identified in the application. Any change in the nature of the use or the structures will require new approvals from the Enfield Planning and Zoning Commission.
3. This project shall be constructed and maintained in accordance with the referenced plans. Minor modifications to the approved plans may be allowed in accordance with the regulations, subject to staff review and approval.
4. A Special Permit is valid for a period of one year from the effective date of approval. A zoning permit must be obtained within this period or this approval shall be rendered null and void, unless an extension is granted by the Commission.

The reasons for approval of the use and the accompanying Site Plan, including any conditions relating to either, are part of the record of the July 23, 2009 Enfield Planning and Zoning Commission meeting.

In accordance with Section 8-3c and Section 8-3d of Connecticut General Statues as amended, the **effective date** of this approval shall the date of recording of this Certificate on the land records of the Enfield Town Clerk. A Special Permit approved by the Commission is valid for a period of one year from the effective date of approval unless an extension is granted by the Commission.

Dated at Enfield, Connecticut this 27 day of August, 2009.

ENFIELD PLANNING AND ZONING COMMISSION

Peter J. Falk

Peter Falk, Secretary

Exhibit B

293 ELM ST

Location	293 ELM ST	**Mblu**	075/ / 0103/ /
Acct#	000600010333	**Owner**	ENFIELD TOWN OF
Assessment	$2,784,150	**Appraisal**	$3,977,340
PID	85	**Building Count**	1
Fire District	3		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$3,179,430	$797,910	$3,977,340
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$2,225,610	$558,540	$2,784,150

Owner of Record

Owner	ENFIELD TOWN OF	**Sale Price**	$0
Co-Owner	PUBLIC SAFETY COMPLX	**Certificate**	1
Address	820 ENFIELD ST ENFIELD, CT 06082	**Book & Page**	626/ 14
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
ENFIELD TOWN OF	$0	1	626/ 14	

Building Information

Building 1 : Section 1

Year Built:	1991
Living Area:	23,348
Replacement Cost:	$3,735,400
Building Percent Good:	73
Replacement Cost Less Depreciation:	$2,726,840

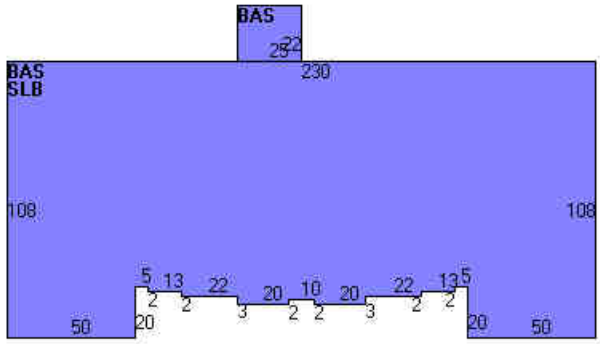
Building Attributes

Field	Description
STYLE	Police Station
MODEL	Comm/Ind
Grade	Average +10
Stories:	1
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	Central
Bldg Use	Exempt Comm
Total Rooms	
Total Bedrms	
Total Baths	
Total H Bths	
Extra Fixtures	
1st Floor Use:	
Heat/AC	Ht/AC Package
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Sus Ceil Wall
Rooms/Prtns	Average
Wall Height	8
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/EnfieldCTPhotos//\00\01\70/90

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	23,348	23,348
SLB	Slab	22,798	0
		46,146	23,348

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
SPR1	SPRINKLERS-WET	23348 SF	$17,040	1

Land

Land Use

Land Line Valuation

Use Code	925	**Size (Acres)**	7.43
Description	Exempt Comm	**Frontage**	
Zone	I-1	**Depth**	
Neighborhood	C110	**Assessed Value**	$558,540
Alt Land Appr	No	**Appraised Value**	$797,910
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving	AS	Asphalt	40000 S.F.	$43,000	1
FN4	FENCE-10'CHAIN			2500 L.F.	$32,500	1
SHD1	Shed	FR	Frame	480 S.F.	$2,940	1
LT1	LIGHTS-IN W/PL			14 UNITS	$11,200	1
TWR1	Cell Twr 1 Carrier			2 UNITS	$150,100	1
TWR1	Cell Twr 1 Carrier			2 UNITS	$190,000	1
SHD2	Shed gd	MS	Masonry	220 S.F.	$3,100	1
PAV1	Paving	AS	Asphalt	2520 S.F.	$2,710	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$3,179,430	$797,910	$3,977,340
2015	$3,227,090	$797,910	$4,025,000
2014	$3,227,090	$797,910	$4,025,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$2,225,610	$558,540	$2,784,150
2015	$2,258,970	$558,540	$2,817,510
2014	$2,258,970	$558,540	$2,817,510

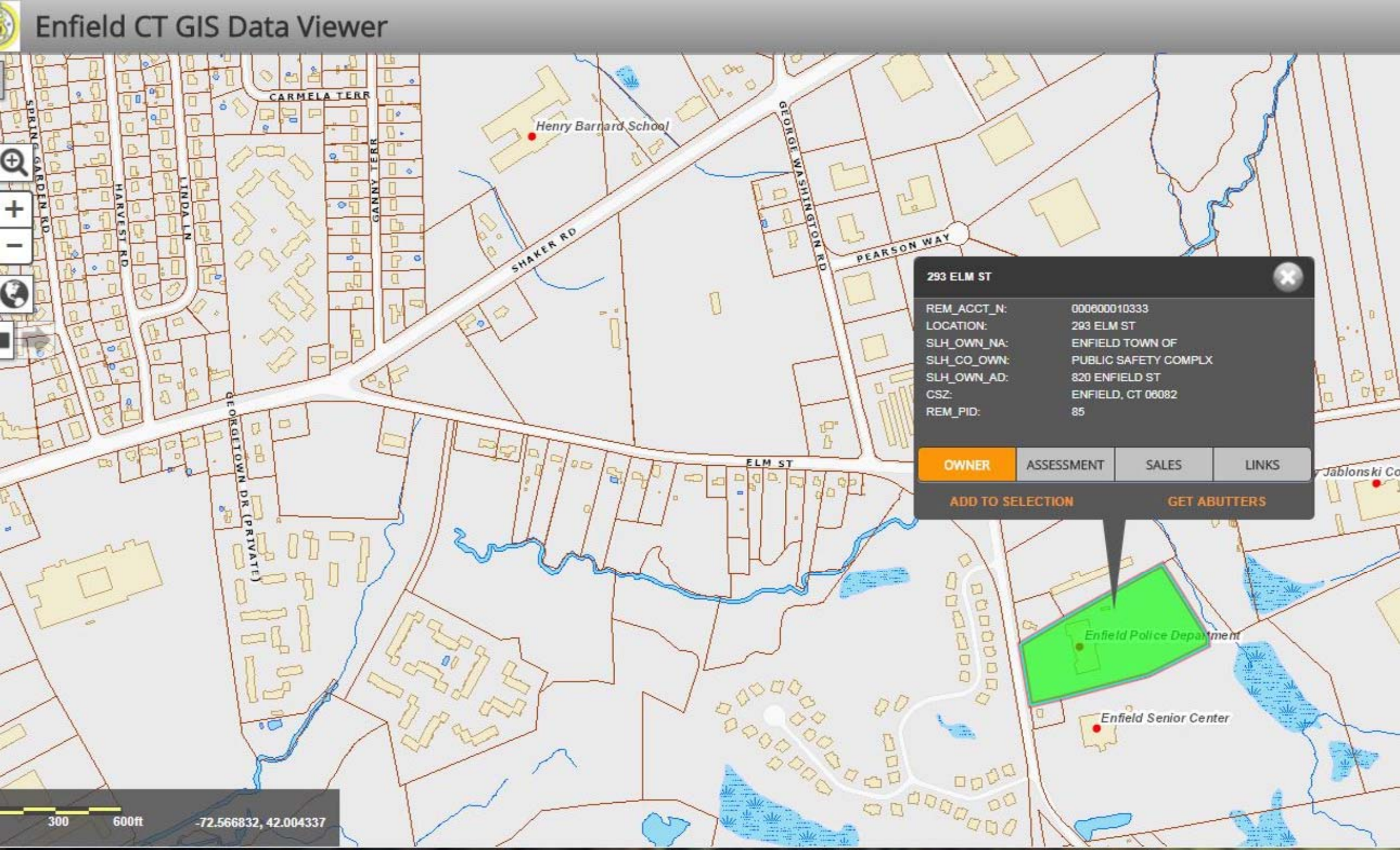
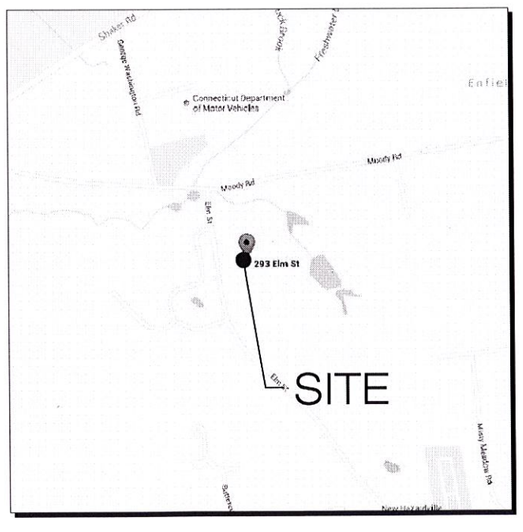

Enfield CT GIS Data Viewer
CARMELA TERR
SPRING GARDEN RD
HARVEST RD
LINDA LN
GANNY TERR
Henry Barnard School
SHAKER RD
GEORGE WASHINGTON RD
PEARSON WAY
GEORGETOWN DR (PRIVATE)
ELM ST
293 ELM ST
REM_ACCT_N: 000600010333
LOCATION: 293 ELM ST
SLH_OWN_NA: ENFIELD TOWN OF
SLH_CO_OWN: PUBLIC SAFETY COMPLX
SLH_OWN_AD: 820 ENFIELD ST
CSZ: ENFIELD, CT 06082
REM_PID: 85
OWNER
ASSESSMENT
SALES
LINKS
ADD TO SELECTION
GET ABUTTERS
Enfield Police Department
Enfield Senior Center
300
600ft
-72.566832, 42.004337

Exhibit C

T-Mobile

NORTHEAST, LLC.

NEW SITE DEVELOPMENT (NSD)
"ENFIELD"
CTHA029A
293 ELM STREET
ENFIELD, CT 06082



VICINITY MAP
SCALE: 1" = 500'

DRAWING INDEX

SITE INFORMATION

T-MOBILE SITE NAME: "ENFIELD"
T-MOBILE SITE NUMBER: CTHA029A
SITE ADDRESS: 293 ELM STREET, ENFIELD, CT 06082

SITE TYPE/DESCRIPTION: INSTALL (1) NEW MICROWAVE ANTENNA AND ASSOCIATED CABLING ON PENDING MOUNTS ON EXIST. LATTICE TOWER.

PROPERTY OWNER: TOWN OF ENFIELD
PUBLIC SAFETY COMPLEX
820 ENFIELD STREET
ENFIELD, CT 06082

LEASING CONTACT: MATTHEW BANDLE
(508) 642-8801

CONSTRUCTION CONTACT: MIKE SCORDO
(203) 520-8471

ENGINEER CONTACT: ROBERT BURNS
(860) 663-1697 x206

LATITUDE: 41°59'51.7366"N
LONGITUDE: 72°33'10.7268"W
ELEVATION: 151'± AMSL
MAP: 75
LOT: 103
MUNICIPALITY: ENFIELD
ZONING DISTRICT: I-1

APPLICANT:
T-MOBILE
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

POWER PROVIDER:
EVERSOURCE (860) 871-3442
NICK KAMM

TELCO PROVIDER:
FRONTIER: (800)-921-8102

CALL BEFORE YOU DIG:
811

CODE COMPLIANCE INFORMATION:
STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
ANSI/TIA-222-G
NATIONAL ELECTRIC CODE, LATEST EDITION

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419
PHONE: (860)-663-1697
FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

T-Mobile NORTHEAST, LLC.
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002
OFFICE: (860)-692-7100

NSS NORTHEAST SITE SOLUTIONS

APPROVALS

LANDLORD: _____ DATE: _____
RF ENGINEER: _____ DATE: _____
CONSTRUCTION: _____ DATE: _____
OPERTATIONS: _____ DATE: _____
SITE ACQ.: _____ DATE: _____

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	07/20/16	FOR REVIEW: RCB
1	08/01/16	ANTENNA REVISIONS: RCB
2	08/03/16	CABLING REVISIONS: RCB
3	09/27/16	1A REVISIONS: RCB
4	09/29/17	FOR PERMIT: SMC
5		
6		

DESIGN PROFESSIONALS OF RECORD

PROF: SCOTT M. CHASSE P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

T-MOBILE
"ENFIELD"

SITE ADDRESS: 293 ELM STREET, ENFIELD, CT 06082

APT FILING NUMBER: CT409190

SITE NUMBER: CTHA029A

DRAWN BY: CSH | CHECKED BY: RCB

DATE: 07/20/16

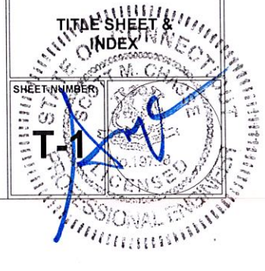
CONFIGURATION

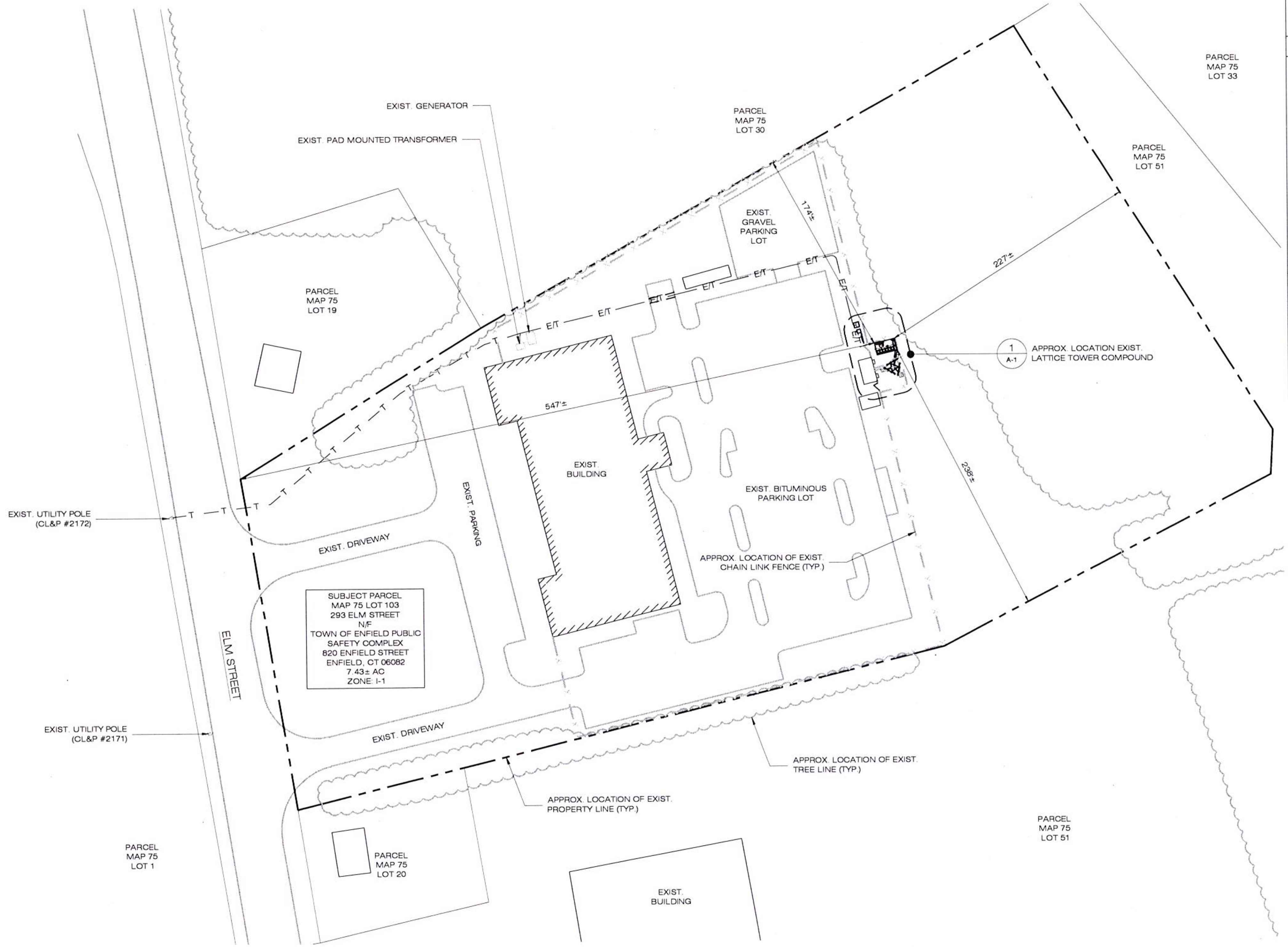
797DB2

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

SHEET TITLE:
TITLE SHEET & INDEX

SHEET NUMBER:
T-1





SITE PLAN

SCALE : 1" = 50'-0"

TRUE N

BULK TABLE

ENFIELD:
293 ELM STREET
ENFIELD, CT 06082
MAP 75
LOT 103
ZONED I-1

ITEM:	ALLOWABLE:	EXIST.:	NEW:
MIN. LOT AREA (SF)	40,000 SF	7.43 AC	NC
MIN. LOT FRONTAGE (FT)	200 FT	280.7± FT	NC
MIN. FRONT YARD (FT)	40 FT	236.7±FT	NC
MIN. SIDE YARD (EACH) (FT)	25 FT	29.6± FT	NC
MIN. REAR YARD (FT)	20 FT	251.3± FT	227± FT
MAX. BUILDING HEIGHT (FT)	25 FT	23± FT	NC
MAX. BUILDING COVERAGE (%)	50%	8.1%	NC
MAX. IMPERVIOUS COVERAGE (%)	66%	34.9%	NC

* EXIST. NON-CONFORMITY
NA = NOT APPLICABLE
NC = NO CHANGE

SITE PLAN NOTES:

PROPERTY OWNER: TOWN OF ENFIELD
PUBLIC SAFETY COMPLEX
820 ENFIELD STREET
ENFIELD, CT 06082

1) NEW USE: INSTALLATION OF PERSONAL WIRELESS SERVICES FACILITY ON EXIST. 160'± AGL LATTICE TOWER W/ NEW GROUND EQUIPMENT AT THE BASE OF THE TOWER;
2) BOUNDARY, SITE & TOPOGRAPHIC INFORMATION TAKEN FROM TOWN OF ENFIELD GEOGRAPHIC INFORMATION SYSTEMS, CONNECTICUT ENVIRONMENTAL CONDITIONS ONLINE, & FIELD MEASUREMENTS TAKEN ON 05/23/16.
3) NO ADDITIONAL PARKING IS NEEDED, AS THE NEW GROUND FACILITY INSTALLATION IS UNMANNED & VISITED APPROXIMATELY ONCE/MONTH FOR ROUTINE MAINTENANCE. ACCORDINGLY, THE NEW DEVELOPMENT WILL NOT ADVERSELY CHANGE OR AFFECT TRAFFIC PATTERNS;
4) SUBJECT FACILITY ON-SITE IS LOCATED WITHIN ZONE X FLOOD ZONE DESIGNATION (FIRM FLOOD INSURANCE RATE MAP #09003C0231F).
5) NEW EQUIPMENT SPACE WILL BE OUTFITTED WITH ONE 150W EXTERIOR LIGHT W/ MOTION DETECTOR (RAB H101B)
6) NO STORMWATER DRAINAGE, WATER SUPPLY, SEWAGE DISPOSAL, REFUSE STORAGE, IS REQUIRED, AS THE NEW INSTALLATION IS FOR AN UNMANNED FACILITY;
7) ALL NEW UTILITIES FOR NEW EQUIPMENT WILL BE PROVIDED FROM NEARBY SERVICES CURRENTLY SERVICING THE SITE; CONNECTIONS TO SHALL BE DETERMINED BY A LOCAL UTILITY REPRESENTATIVE.
8) NO DUST, FUMES, ODORS, OR VIBRATIONS WILL OCCUR AS A RESULT OF THE NEW INSTALLATION.

LEGEND

CONCRETE CURB	UTILITY POLE
DROP CURB	BOLLARD
WALL	CHAIN LINK FENCE
EDGE OF PAVEMENT	STOCKADE FENCE
OVERHEAD WIRES	FENCE OTHER
STRUCTURE - MANHOLE	TOP/BOTTOM OF CURB
STRUCTURE - TELEPHONE	SPOT ELEVATION
STRUCTURE - DRAINAGE	CONCRETE
WATER VALVE	TREE LINE
WATER METER	MONUMENT
FIRE HYDRANT	HEDGE
DRAINAGE INLET	TREE
SIGN	HANDICAP PARKING
LIGHT POLE	PARKING STALL COUNT

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419
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35 GRIFFIN ROAD
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NSS NORTHEAST SITE SOLUTIONS

APPROVALS

LANDLORD: ______ DATE: ______
RF ENGINEER: ______ DATE: ______
CONSTRUCTION: ______ DATE: ______
OPERTATIONS: ______ DATE: ______
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CONSTRUCTION DOCUMENTS

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6		

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APT FILING NUMBER: CT409190

SITE NUMBER: CTHA029A

DRAWN BY: CSH | CHECKED BY: RCB

DATE: 07/20/16

CONFIGURATION

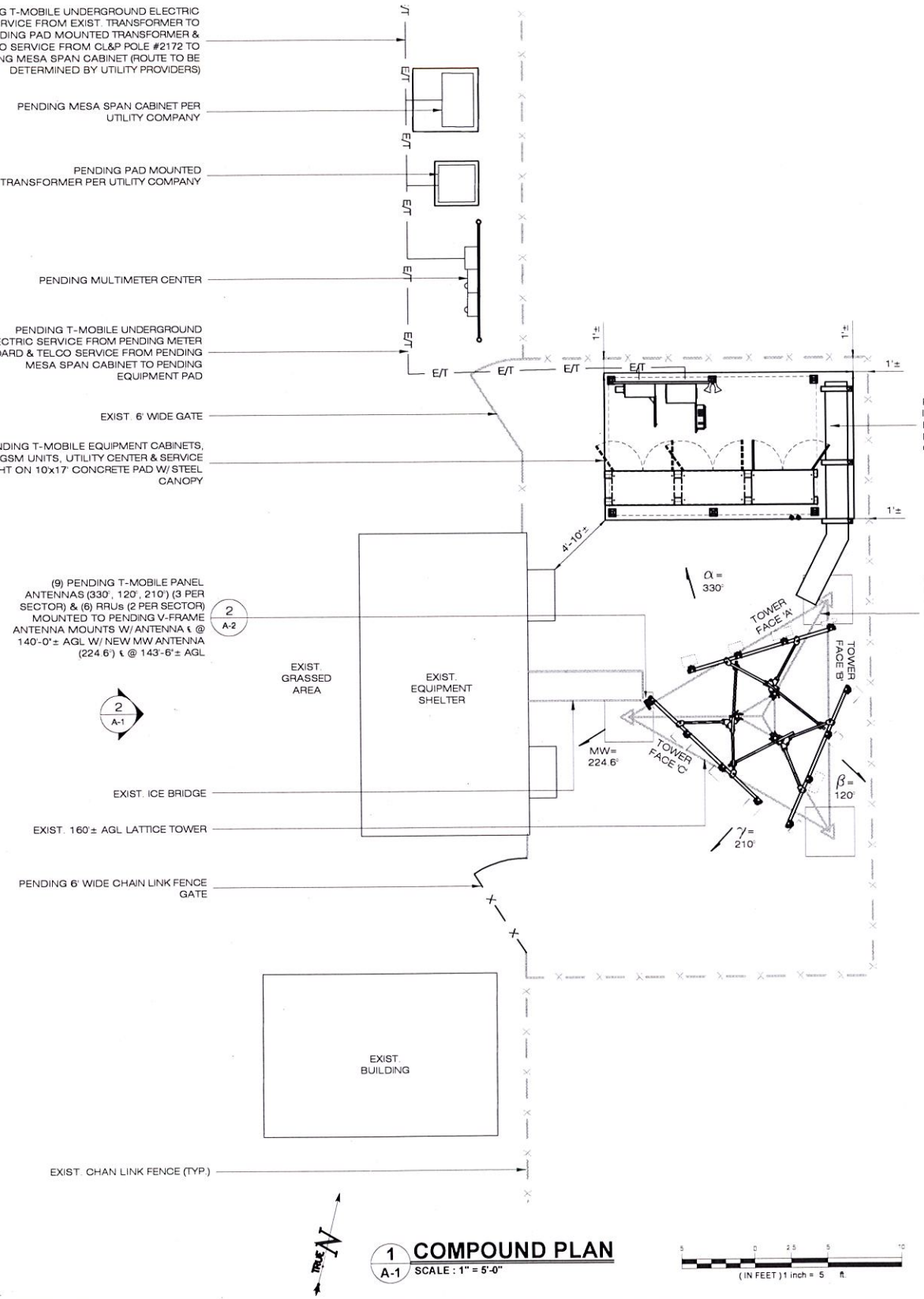
797DB2

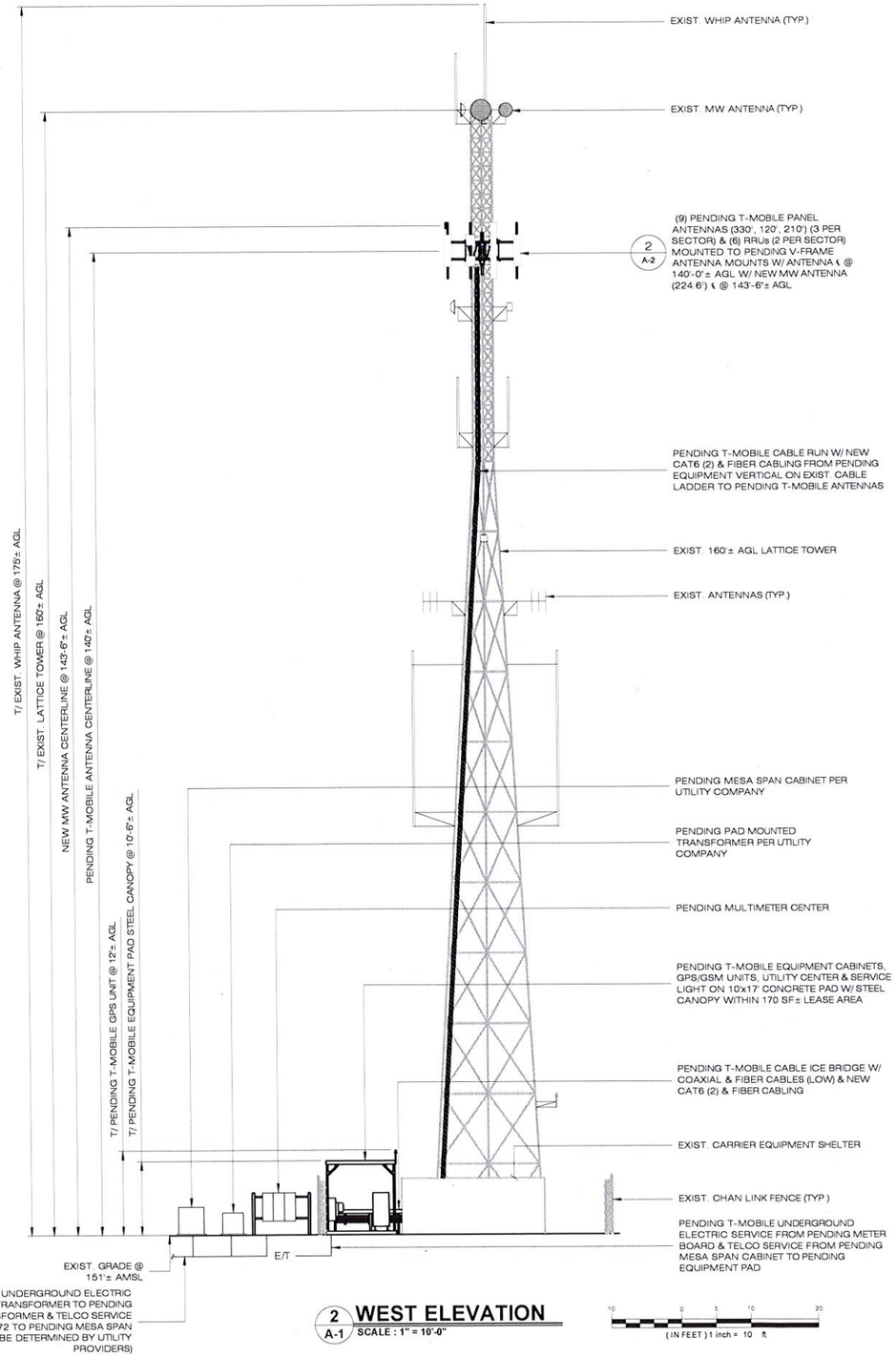
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

SHEET TITLE: SITE PLAN

SHEET NUMBER: **SP-1**

STATE OF CONNECTICUT · SCOTT M. CHASSE · No. 19??? · LICENSED PROFESSIONAL ENGINEER





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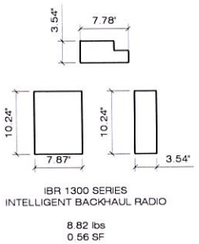
SHEET TITLE:
PLAN & ELEVATION

SHEET NUMBER:
A-1

STATE OF CONNECTICUT
SCOTT M. CHASSE
No. 19726
LICENSED PROFESSIONAL ENGINEER

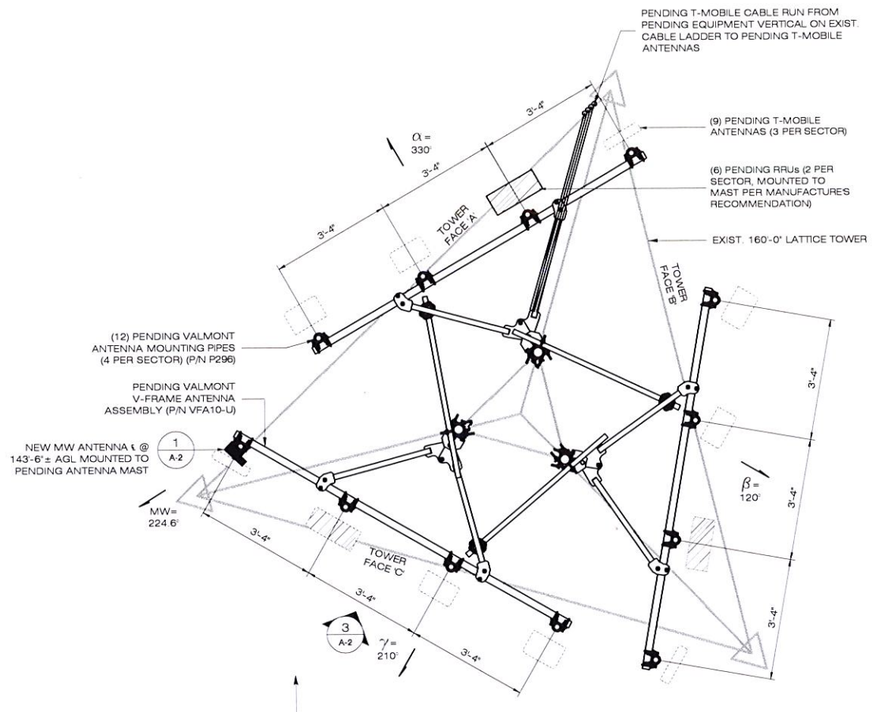


IBR 1300 SERIES
INTELLIGENT BACKHAUL RADIO

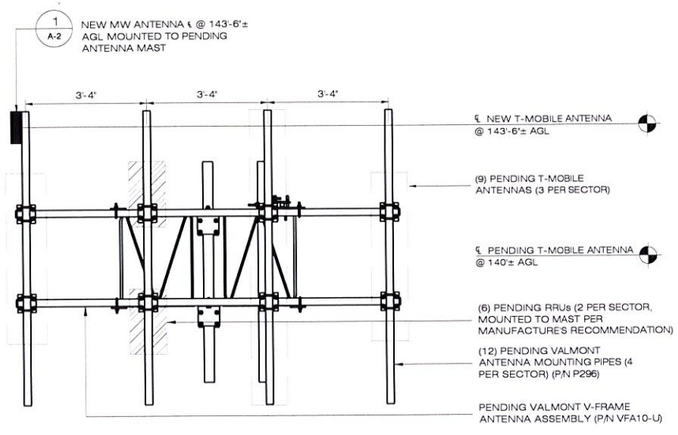
8.82 lbs
0.56 SF

MW ANTENNA

1 ANTENNA DETAILS
A-2 SCALE : ½" = 1'-0"



2 ANTENNA MOUNTING PLAN
A-2 SCALE : ½"=1'-0"



3 ANTENNA MOUNTING DETAIL
A-2 SCALE : ½" = 1'-0"

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3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419
WWW.ALLPOINTSTECH.COM
PHONE: (860)-663-1697
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T-Mobile
NORTHEAST, LLC.

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NSS NORTHEAST SITE SOLUTIONS

APPROVALS

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SHEET TITLE:

ANTENNA DETAILS

SHEET NUMBER:

A-2

Exhibit D

ALL-POINTS TECHNOLOGY CORPORATION

STRUCTURAL ANALYSIS REPORT
160' SELF-SUPPORTING TOWER
ENFIELD, CONNECTICUT

Prepared for
Northeast Site Solutions, LLC

T-Mobile Site #CTHA029A

September 29, 2017

APT Project #CT411260

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STRUCTURAL ANALYSIS REPORT
160' PiROD SELF-SUPPORTING TOWER
ENFIELD, CONNECTICUT
prepared for
Northeast Site Solutions, LLC

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of this 160-foot self-supporting tower. The analysis was performed for T-Mobile's proposed installation of one Fastback Networks IBR 1300 compact radio as detailed below. The antenna is to be fed by one ¼" fiber and two Cat 6 cables, and will be mounted on an existing mount.

APT's analysis indicates the tower meets the requirements of the Connecticut State Building Code and TIA-222 Revision G with the proposed equipment.

Evaluation of the existing base foundation was performed from original Valmont design drawings. The foundation was found to be adequately sized for the proposed equipment.

INTRODUCTION:

A structural analysis was performed on the above-mentioned communications tower by APT for Northeast Site Solutions, LLC. The tower is located at the Enfield Police Department at 293 Elm Street in Enfield, Connecticut. APT previously visited the tower site on June 22, 2016 to record physical and dimensional properties of the structure and its appurtenances, and to assess the condition of the tower.

The structure is a 160-foot galvanized steel guyed tower manufactured by Valmont/PiROD. The tower features truss legs with angle steel bracing members from 0'-110', and solid rod legs and bracing members from 110'-160'. The following documents were utilized:

Document	Remarks	Date	Source
Valmont tower & foundation drawings	Valmont Eng. File #A-168131	10/27/2011	Owner
Lease exhibit	APT Project no. CT409190	5/31/2016	APT
Antenna design	Listing of proposed equipment	4/15/2016	T-Mobile

The analysis was performed in accordance with TIA-222 Revisions G using the following antenna inventory (proposed equipment shown in **bold** text):

Carrier	Elev.	Antenna	Mount	Coax.
	170'	Lightning rod	14' pipe extension	N.A.
Enfield PD	158'	3', 2' high-performance dishes, 2' dish w/out radome, 1' square panel, 10' omnidirectional whip	(3) 3' sidearms	(5) 7/8", ¼"
T-Mobile	**143.5'**	**(1) IBR 1300 compact radio**	**On sector mount below**	**(1) fiber, (2) Cat 6**
T-Mobile	140'	(3) LNX-6515DS, (3) APX16DWV-16DWVS, (3) AIR 32 B66Aa B2a panels, (3) RRUS-11, (3) RRUS-32 RRHs	(3) 10'-6" sector mounts	(1) 9x18 hybrid
Enfield PD	133'	2' high-performance dish, 1' square panel	(2) 3' sidearms	(2) 7/8", (2) ¼"
Enfield PD	114'	3', (2) 12' omnidirectional whips	(3) 3' sidearms	(3) 7/8"
Enfield PD	99'	1' square panel	Leg	¼"
Enfield PD	88'	2', (2) 3' yagis	(3) 3' sidearms	(3) 7/8", ¼"
Enfield PD	58'	12', (2) 20' omnidirectional whips	(3) 3' sidearms	(3) 1/2"
Enfield PD	18'	GPS	3' sidearm	1/2"

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with the Connecticut State Building Code and TIA-222, Revision G (TIA), Structural Standard for Antenna Supporting Structures and Antennas.

The analysis was conducted using a 3-second gust wind speed of 105 miles per hour with no ice and 50-mph with 1" radial ice in accordance with the TIA-222-G standard for Hartford County, Connecticut. The following additional design criteria were used:

Structure Class:	II
Topographic Category:	1
Exposure Category:	B

Analysis Results:

Analysis of the tower was conducted in accordance with the criteria outlined herein with antenna changes as previously described. The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Leg Capacity	Bracing Capacity
150'-160'	4%	5%
130'-150'	19%	22%
110'-130'	37%	18%
100'-110'	39%	31%
80'-100'	35%	29%
60'-80'	43%	39%
40'-60'	51%	55%
20'-40'	43%	69%
0'-20'	48%	62%

Bracing, Splice and Anchor Bolts:

Connection bolts were evaluated under the proposed loading. All bolts were found to be adequately sized to support the proposed loads.

Base Foundation:

Evaluation of the existing base foundation was performed from original design drawings. The foundation was determined to be adequately sized for the proposed equipment. Factored base reactions imposed with the additional antennas were calculated as follows:

Compression:	149.9 kips
Uplift:	-130.7 kips
Shear:	15.1 kips
Overturning Moment:	1958 ft-kips

CONCLUSIONS AND RECOMMENDATIONS:

APT's structural analysis indicates that the 160-foot self-supporting tower located at the Enfield Police Department at 293 Elm Street in Enfield, Connecticut meets the requirements of the Connecticut State Building Code with T-Mobile's proposed antenna and associated feed lines.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

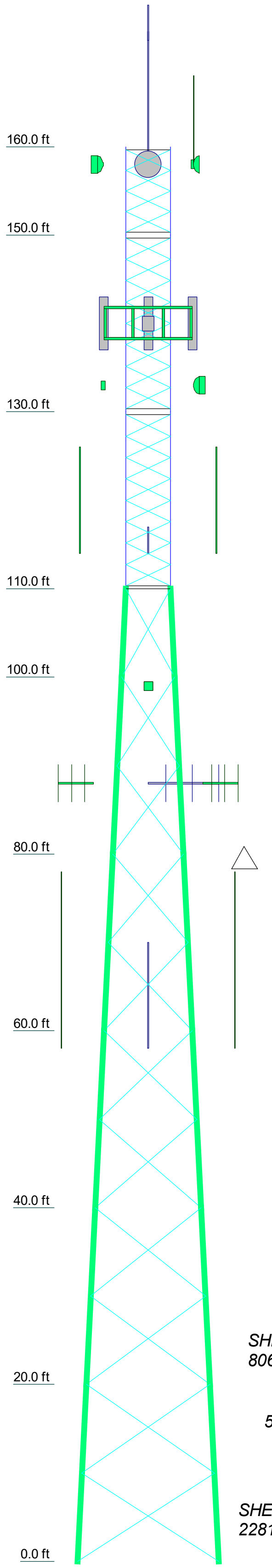
1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating torque arms or guys.
4. Installing antenna mounting gates or side arms.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Tower Schematic

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Face Width (ft)	# Panels @ (ft)	Weight (lb)
T1	SR 1 3/4	A572-50	SR 7/8	A36	SR 1	SR 1	5	4 @ 2.33333	596.7
T2	SR 2							16 @ 2.41667	1267.0
T3	SR 2 1/4		SR 1		SR 1 1/4	SR 1 1/4			1649.5
T4	Pirod 105216		L2 1/2x2 1/2x3/16		L3x3x3/16	N.A.		11 @ 10	942.0
T5	Pirod 105217						6		2129.3
T6							8		2175.2
T7					N.A.		10		2338.5
T8	Pirod 105218						12		2804.5
T9			L3x3x3/16				14		3012.7
							16		16915.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Generic Lightning Rod 4' copper	160	LNX-6515DS-T4M	140
14' x 2-7/8" pipe mount	160	LNX-6515DS-T4M	140
1' square panel	158	1' square panel	133
10' x 2" omni whip	158	3' sidearm	133
2' sidearm	158	3' sidearm	133
2' sidearm	158	2' HP dish	133
2' sidearm	158	12' x 2" omni whip	126 - 114
3' HP dish	158	12' x 2" omni whip	126 - 114
2' dish, no radome	158	3' x 1" omni whip	117 - 114
2' HP dish	158	6' sidearm	114
Fastback IBR 1300	143.5	6' sidearm	114
APX16DWV-16DWVS	140	6' sidearm	114
APX16DWV-16DWVS	140	1' square panel	99
AIR 32 B66Aa B2a	140	3' Yagi	88
AIR 32 B66Aa B2a	140	3' sidearm	88
AIR 32 B66Aa B2a	140	3' sidearm	88
APX16DWV-16DWVS	140	2' yagi	88
Ericsson RRUS-11	140	3' sidearm	88
Ericsson RRUS-11	140	3' Yagi	88
Ericsson RRUS-11	140	20' x 2.5" omni whip	78 - 58
Ericsson RRUS-32	140	20' x 2.5" omni whip	78 - 58
Ericsson RRUS-32	140	12' x 2" omni whip	70 - 58
Ericsson RRUS-32	140	6' sidearm	58
10' sector mount	140	6' sidearm	58
10' sector mount	140	6' sidearm	58
10' sector mount	140	GPS on 3' standoff	18
LNX-6515DS-T4M	140		

MATERIAL STRENGTH

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

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 149902 lb
SHEAR: 15080 lb

UPLIFT: -130682 lb
SHEAR: 13403 lb

AXIAL
110632 lb
SHEAR
8061 lb
MOMENT
779638 lb-ft
TORQUE 1208 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL
25733 lb
SHEAR
22818 lb
MOMENT
1958348 lb-ft
TORQUE 6662 lb-ft
REACTIONS - 105 mph WIND

All-Points Technology Corporation 116 Grandview Road, Conway, NH 03818, Phone: (603) 496-5853, FAX: (603) 447-2124	Job: ***160' PiROD Tower***		
	Project: ***CT411260 Enfield***		
	Client: NSS	Drawn by: Rob Adair	App'd:
	Code: TIA-222-G	Date: 09/29/17	Scale: NTS
	Path: Z:\Shared\NH Office\Jobs\4 T-Mobile\CT411260 Enfield CTHA029A\CT411260 Enfield.eri		Dwg No. E-1

Appendix B

Calculations

Search Results

Query Date: Thu Dec 08 2016
Latitude: 41.9974
Longitude: -72.5539

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 110
Risk Category II: 121
Risk Category III-IV: 130
MRI 10-Year:** 76
MRI 25-Year:** 86
MRI 50-Year:** 92
MRI 100-Year:** 98

ASCE 7-05 Windspeed:
97 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
79 (fastest mile in mph)

*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Print your results

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Tower Input Data

The main tower is a 3x free standing tower with an overall height of 160.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 16.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 105 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	A	No	Ar (CaAa)	88.00 - 8.00	-10.0000	0.5	13	7	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	114.00 - 88.00	-8.0000	0.5	10	5	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	133.00 - 114.00	-6.0000	0.5	7	4	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	158.00 - 133.00	-4.0000	0.5	5	3	1.1100	1.1100		0.54
1/2	A	No	Ar (CaAa)	58.00 - 8.00	-12.0000	0.5	3	3	0.5800	0.5800		0.25
1/2	A	No	Ar (CaAa)	18.00 - 8.00	-12.0000	0.5	1	1	0.5800	0.5800		0.25
1/4	A	No	Ar (CaAa)	158.00 - 8.00	-11.0000	0.5	1	1	0.2500	0.2500		0.05
1/4	A	No	Ar (CaAa)	133.00 - 8.00	-9.0000	0.5	1	1	0.2500	0.2500		0.05
1/4	A	No	Ar (CaAa)	99.00 - 8.00	-7.0000	0.5	1	1	0.2500	0.2500		0.05
1/4	A	No	Ar (CaAa)	88.00 - 8.00	-5.0000	0.5	1	1	0.2500	0.2500		0.05
Safety Line 3/8	B	No	Ar (CaAa)	160.00 - 0.00	4.0000	0.5	1	1	0.3750	0.3750		0.22
1.57" Hybrid fiber-power cable	A	No	Ar (CaAa)	140.00 - 8.00	-2.0000	0.5	1	1	1.5700	1.5700		0.66
Cat 6	A	No	Ar (CaAa)	143.50 - 8.00	-2.0000	0.5	2	2	0.2500	0.2500		0.05
1/4" fiber	A	No	Ar (CaAa)	143.50 - 8.00	-2.0000	0.5	1	1	0.2500	0.2500		0.05

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft^2	ft^2	lb
Generic Lightning Rod 4' copper	A	From Leg	0.00	0.0000	160.00	No Ice	0.50	0.50	0.00
			0.00			1/2" Ice	1.00	1.00	0.00
			14.00			1" Ice	1.50	1.50	0.00
14' x 2-7/8" pipe mount	A	From Leg	0.00	0.0000	160.00	No Ice	4.03	4.03	107.00
			0.00			1/2" Ice	5.46	5.46	136.25

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			6.00			1" Ice	6.91	6.91	174.49
1' square panel	B	From Leg	3.00	0.0000	158.00	No Ice	1.20	0.32	15.00
			0.00			1/2" Ice	1.34	0.40	22.91
			0.00			1" Ice	1.48	0.49	32.76
10' x 2" omni whip	B	From Leg	3.00	0.0000	158.00	No Ice	2.00	2.00	60.00
			0.00			1/2" Ice	3.02	3.02	75.50
			5.00			1" Ice	4.07	4.07	97.47
2' sidearm	A	None		0.0000	158.00	No Ice	0.95	0.48	20.00
						1/2" Ice	1.45	0.73	35.00
						1" Ice	2.25	1.13	50.00
2' sidearm	B	None		0.0000	158.00	No Ice	0.95	0.48	20.00
						1/2" Ice	1.45	0.73	35.00
						1" Ice	2.25	1.13	50.00
2' sidearm	C	None		0.0000	158.00	No Ice	0.95	0.48	20.00
						1/2" Ice	1.45	0.73	35.00
						1" Ice	2.25	1.13	50.00
LNX-6515DS-T4M	A	From Leg	4.00	0.0000	140.00	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNX-6515DS-T4M	B	From Leg	4.00	0.0000	140.00	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNX-6515DS-T4M	C	From Leg	4.00	0.0000	140.00	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
APX16DWV-16DWVS	A	From Leg	4.00	0.0000	140.00	No Ice	6.08	2.00	25.00
			0.00			1/2" Ice	6.44	2.33	56.34
			0.00			1" Ice	6.80	2.66	92.36
APX16DWV-16DWVS	B	From Leg	4.00	0.0000	140.00	No Ice	6.08	2.00	25.00
			0.00			1/2" Ice	6.44	2.33	56.34
			0.00			1" Ice	6.80	2.66	92.36
APX16DWV-16DWVS	C	From Leg	4.00	0.0000	140.00	No Ice	6.08	2.00	25.00
			0.00			1/2" Ice	6.44	2.33	56.34
			0.00			1" Ice	6.80	2.66	92.36
AIR 32 B66Aa B2a	A	From Leg	4.00	0.0000	140.00	No Ice	7.10	4.79	133.00
			0.00			1/2" Ice	7.55	5.21	178.82
			0.00			1" Ice	8.02	5.65	229.91
AIR 32 B66Aa B2a	B	From Leg	4.00	0.0000	140.00	No Ice	7.10	4.79	133.00
			0.00			1/2" Ice	7.55	5.21	178.82
			0.00			1" Ice	8.02	5.65	229.91
AIR 32 B66Aa B2a	C	From Leg	4.00	0.0000	140.00	No Ice	7.10	4.79	133.00
			0.00			1/2" Ice	7.55	5.21	178.82
			0.00			1" Ice	8.02	5.65	229.91
Fastback IBR 1300	C	From Leg	4.00	0.0000	143.50	No Ice	0.67	0.31	10.00
			0.00			1/2" Ice	0.78	0.38	15.42
			0.00			1" Ice	0.89	0.47	22.44
Ericsson RRUS-11	A	From Leg	3.50	0.0000	140.00	No Ice	2.78	1.19	55.00
			0.00			1/2" Ice	2.99	1.33	75.80
			0.00			1" Ice	3.21	1.49	99.63
Ericsson RRUS-11	B	From Leg	3.50	0.0000	140.00	No Ice	2.78	1.19	55.00
			0.00			1/2" Ice	2.99	1.33	75.80
			0.00			1" Ice	3.21	1.49	99.63
Ericsson RRUS-11	C	From Leg	3.50	0.0000	140.00	No Ice	2.78	1.19	55.00
			0.00			1/2" Ice	2.99	1.33	75.80
			0.00			1" Ice	3.21	1.49	99.63
Ericsson RRUS-32	A	From Leg	3.50	0.0000	140.00	No Ice	3.31	2.42	80.00
			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
Ericsson RRUS-32	B	From Leg	3.50	0.0000	140.00	No Ice	3.31	2.42	80.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
Ericsson RRUS-32	C	From Leg	3.50	0.0000	140.00	No Ice	3.31	2.42	80.00
			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
10' sector mount	A	None		0.0000	140.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
10' sector mount	B	None		0.0000	140.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
10' sector mount	C	None		0.0000	140.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
1' square panel	C	From Leg	3.00	0.0000	133.00	No Ice	1.20	0.32	15.00
			0.00			1/2" Ice	1.34	0.40	22.91
			0.00			1" Ice	1.48	0.49	32.76
3' sidearm	B	None		0.0000	133.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
						1" Ice	2.93	1.47	105.00
3' sidearm	C	None		0.0000	133.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
						1" Ice	2.93	1.47	105.00
3' x 1" omni whip	A	From Leg	6.00	0.0000	117.00 - 114.00	No Ice	0.30	0.30	15.00
			0.00			1/2" Ice	0.54	0.54	17.85
			0.00			1" Ice	0.73	0.73	22.79
6' sidearm	A	None		0.0000	114.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
12' x 2" omni whip	B	From Leg	6.00	0.0000	126.00 - 114.00	No Ice	2.40	2.40	70.00
			0.00			1/2" Ice	3.63	3.63	88.56
			0.00			1" Ice	4.87	4.87	114.80
6' sidearm	B	None		0.0000	114.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
12' x 2" omni whip	C	From Leg	6.00	0.0000	126.00 - 114.00	No Ice	2.40	2.40	70.00
			0.00			1/2" Ice	3.63	3.63	88.56
			0.00			1" Ice	4.87	4.87	114.80
6' sidearm	C	None		0.0000	114.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
1' square panel	B	None		0.0000	99.00	No Ice	1.20	0.32	15.00
						1/2" Ice	1.34	0.40	22.91
						1" Ice	1.48	0.49	32.76
2' yagi	A	From Leg	3.00	0.0000	88.00	No Ice	0.20	0.20	10.00
			0.00			1/2" Ice	0.32	0.32	11.93
			0.00			1" Ice	0.45	0.45	15.35
3' sidearm	A	None		0.0000	88.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
						1" Ice	2.93	1.47	105.00
3' Yagi	B	From Leg	3.00	0.0000	88.00	No Ice	2.08	2.08	30.95
			0.00			1/2" Ice	3.79	3.79	52.87
			0.00			1" Ice	5.52	5.52	85.27
3' sidearm	B	None		0.0000	88.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
						1" Ice	2.93	1.47	105.00
3' Yagi	C	From Leg	3.00	0.0000	88.00	No Ice	2.08	2.08	30.95
			0.00			1/2" Ice	3.79	3.79	52.87
			0.00			1" Ice	5.52	5.52	85.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3' sidearm	C	None		0.0000	88.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
						1" Ice	2.93	1.47	105.00
12' x 2" omni whip	A	From Leg	6.00 0.00 0.00	0.0000	70.00 - 58.00	No Ice 1/2" Ice 1" Ice	2.40 3.63 4.87	2.40 3.63 4.87	70.00 88.56 114.80
6' sidearm	A	None		0.0000	58.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
20' x 2.5" omni whip	B	From Leg	6.00 0.00 0.00	0.0000	78.00 - 58.00	No Ice 1/2" Ice 1" Ice	5.00 7.03 9.07	5.00 7.03 9.07	50.00 86.96 136.55
6' sidearm	B	None		0.0000	58.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
20' x 2.5" omni whip	C	From Leg	6.00 0.00 0.00	0.0000	78.00 - 58.00	No Ice 1/2" Ice 1" Ice	5.00 7.03 9.07	5.00 7.03 9.07	50.00 86.96 136.55
6' sidearm	C	None		0.0000	58.00	No Ice	4.17	2.09	75.00
						1/2" Ice	6.17	3.09	125.00
						1" Ice	8.17	4.09	200.00
GPS on 3' standoff	C	From Leg	3.00 0.00 0.00	0.0000	18.00	No Ice 1/2" Ice 1" Ice	0.60 0.79 0.99	0.60 0.79 0.99	50.00 55.81 63.86

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
3' HP dish	A	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	0.0000		158.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	75.00 113.33 153.33
2' dish, no radome	B	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		158.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	50.00 67.50 85.00
2' HP dish	C	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	0.0000		158.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	50.00 67.50 85.00
2' HP dish	B	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	0.0000		133.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	50.00 67.50 85.00

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 150	2.914	12	0.1579	0.0164
T2	150 - 130	2.582	12	0.1570	0.0147
T3	130 - 110	1.922	12	0.1490	0.0108
T4	110 - 100	1.325	12	0.1243	0.0083
T5	100 - 80	1.078	12	0.1062	0.0067
T6	80 - 60	0.675	12	0.0817	0.0047
T7	60 - 40	0.372	12	0.0577	0.0034
T8	40 - 20	0.168	12	0.0340	0.0023
T9	20 - 0	0.047	12	0.0169	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Generic Lightning Rod 4' copper	12	2.914	0.1579	0.0164	747913
158.00	3' HP dish	12	2.847	0.1578	0.0161	747913
143.50	Fastback IBR 1300	12	2.365	0.1556	0.0133	410844
140.00	LNX-6515DS-T4M	12	2.249	0.1545	0.0126	208820
133.00	2' HP dish	12	2.019	0.1510	0.0113	105008
126.00	12' x 2" omni whip	12	1.795	0.1456	0.0102	62256
120.00	12' x 2" omni whip	12	1.610	0.1391	0.0095	43675
115.50	3' x 1" omni whip	12	1.478	0.1331	0.0090	35591
99.00	1' square panel	12	1.055	0.1046	0.0066	38428
88.00	2' yagi	12	0.823	0.0902	0.0053	45364
78.00	20' x 2.5" omni whip	12	0.640	0.0795	0.0045	50912
73.00	20' x 2.5" omni whip	12	0.558	0.0737	0.0042	49495
70.00	12' x 2" omni whip	12	0.511	0.0701	0.0040	48561
68.00	20' x 2.5" omni whip	12	0.481	0.0677	0.0039	47958
64.00	12' x 2" omni whip	12	0.425	0.0627	0.0037	46801
63.00	20' x 2.5" omni whip	12	0.411	0.0615	0.0036	46562
58.00	12' x 2" omni whip	12	0.347	0.0552	0.0033	47092
18.00	GPS on 3' standoff	12	0.040	0.0152	0.0009	59824

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325N	0.6250	5	446.86	24850.50	0.018 ✓	1	Bolt DS
T2	150	Leg	A325N	0.7500	5	3656.05	35784.70	0.102 ✓	1	Bolt DS
T3	130	Leg	A325N	1.0000	6	8247.52	53014.40	0.156 ✓	1	Bolt Tension
T4	110	Leg	A325N	1.0000	6	8426.10	53014.40	0.159 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	3504.08	12723.80	0.275 ✓	1	Member Bearing
		Top Girt	A325N	1.0000	1	721.57	12723.80	0.057 ✓	1	Member Bearing
T5	100	Leg	A325N	1.0000	6	11286.20	53014.40	0.213 ✓	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	1.0000	1	3069.45	12723.80	0.241 ✔	1	Member Bearing
T6	80	Leg	A325N	1.0000	6	13823.00	53014.40	0.261 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	2999.57	12723.80	0.236 ✔	1	Member Bearing
T7	60	Leg	A325N	1.0000	6	16362.40	53014.40	0.309 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	3341.55	12723.80	0.263 ✔	1	Member Bearing
T8	40	Leg	A325N	1.0000	6	18839.00	53014.40	0.355 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	3419.65	12723.80	0.269 ✔	1	Member Bearing
T9	20	Leg	A325N	1.0000	6	21124.80	53014.40	0.398 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4311.66	12723.80	0.339 ✔	1	Member Bearing

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	**160 - 150**	**Leg**	**1 3/4**	**3**	**-3074.22**	**80225.50**	**3.8**	**Pass**
		Diagonal	7/8	13	-587.78	11163.70	5.3	Pass
		Top Girt	1	4	-47.53	6669.94	0.7	Pass
		Bottom Girt	1	7	-229.98	6669.94	3.4	Pass
T2	**150 - 130**	**Leg**	**2**	**36**	**-21430.30**	**110545.00**	**19.4**	**Pass**
		Diagonal	7/8	44	-2425.27	11136.80	21.8	Pass
		Top Girt	1	37	-260.36	6727.56	3.9	Pass
		Bottom Girt	1	40	-950.92	6727.56	14.1	Pass
T3	**130 - 110**	**Leg**	**2 1/4**	**93**	**-54099.50**	**147321.00**	**36.7**	**Pass**
		Diagonal	1	101	-2930.04	16644.50	17.6	Pass
		Top Girt	1 1/4	94	-938.71	16476.40	5.7	Pass
		Bottom Girt	1 1/4	97	-421.45	16476.40	2.6	Pass
T4	**110 - 100**	**Leg**	**Pirod 105216**	**150**	**-54968.70**	**142493.00**	**38.6**	**Pass**
		Diagonal	L2 1/2x2 1/2x3/16	156	-3905.79	12697.80	30.8	Pass
		Top Girt	L3x3x3/16	151	-608.88	21165.30	2.9	Pass
T5	**100 - 80**	**Leg**	**Pirod 105217**	**162**	**-74670.60**	**214859.00**	**34.8**	**Pass**
		Diagonal	L2 1/2x2 1/2x3/16	166	-2935.76	10182.10	28.8	Pass
T6	**80 - 60**	**Leg**	**Pirod 105217**	**177**	**-92429.60**	**214859.00**	**43.0**	**Pass**
		Diagonal	L2 1/2x2 1/2x3/16	181	-3154.31	8118.15	38.9	Pass
T7	**60 - 40**	**Leg**	**Pirod 105217**	**192**	**-110500.00**	**214859.00**	**51.4**	**Pass**
		Diagonal	L2 1/2x2 1/2x3/16	196	-3568.85	6524.21	54.7	Pass
T8	**40 - 20**	**Leg**	**Pirod 105218**	**207**	**-128298.00**	**300681.00**	**42.7**	**Pass**
		Diagonal	L2 1/2x2 1/2x3/16	211	-3663.25	5297.34	69.2	Pass
T9	**20 - 0**	**Leg**	**Pirod 105218**	**222**	**-145007.00**	**300681.00**	**48.2**	**Pass**
		Diagonal	L3x3x3/16	226	-4758.89	7622.94	62.4	Pass
							Summary	
						Leg (T7)	51.4	Pass
						Diagonal (T8)	69.2	Pass
						Top Girt (T3)	5.7	Pass
						Bottom Girt (T2)	14.1	Pass
						Bolt Checks	39.8	Pass
						RATING =	**69.2**	**Pass**

All-Points Technology Corp., P.C.
116 Grandview Road
Conway, NH 03818
(603) 496-5853

Client:	**NSS**	Site No.:	**CTHA029A**
Job:	**Enfield, CT**	Job No.:	**CT411260**
Calculated By:	**R. Adair**	Date:	**29-Sep-17**

Program assumes:

Mat is square in plan view.
Water table is below bottom of mat.
Unit weight of concrete = 150 pcf
Unit weight of soil = 100 pcf
Self-supporting tower with 3 piers

Information to be provided:

Pier is round or square in plan dimension ("R" or "S")	Shape =	R	
OTM = Overturning Moment to be resisted	OTM =	1958	ft-kips
H = Height from ground surface to top of mat (if buried	H =	4.0	ft.
P_M = Projection of pier above mat	P_M =	4.5	ft.
y = Thickness of mat	y =	1.50	ft.
x = Width of mat	x =	23.50	ft.
d = Diameter of round pier	d =	3.5	ft.
S = Size of pier vertical bars	S =	6	

Mass of tower and appurtenances (below)

Results:

Component	Mass	Moment Arm	Moment Resist.
Pier	6.5 kips	11.75 ft.	76.3 ft-kips
Overburden	264.7 kips	11.75 ft.	3110.3 ft-kips
Mat	124.3 kips	11.75 ft.	1460.0 ft-kips

Overturning Moment Resistance = 4646.58 ft-kips
Factor of Safety = 2.37 SATISFACTORY
Concrete Quantity = 35.5 c.y.

Exhibit E

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTHA029A

Enfield
293 Elm Street
Enfield, CT 06082

September 26, 2017

EBI Project Number: 6217004210

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	2.292%

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

EBI Consulting
environmental | engineering | due diligence

September 26, 2017

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

Emissions Analysis for Site: **CTHA029A – Enfield**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **293 Elm Street, Enfield, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 5 GHz microwave bands is 1000 $\mu W/cm^2$. 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 **293 Elm Street, Enfield, 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 and microwave 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 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 (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) 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

5) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

6) 1 microwave backhaul channel (5 GHz) was considered for the microwave backhaul. This microwave channel has a transmit power of 1 Watt.

7) 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.

8) For the following calculations, the sample point was the top of a 6-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.

9) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** & **Ericsson AIR32 B66A/B2A** for 1900 MHz (PCS) and 2100 MHz (AWS) channels, the **Commscope LNX-6515DS-A1M** for 700 MHz channels and the **Fastback Networks IBR 1300** for 5 GHz microwave backhaul. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR32 B66A/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. the **Fastback Networks IBR 1300 antenna** has a maximum gain of **10 dBd** at 5 GHz**.** 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.

10) The antenna mounting height centerline of the proposed antennas is **140 feet** above ground level (AGL) for all standard panel antennas and for the proposed 5 GHz microwave radio / antenna.

11) 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.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	140	Height (AGL):	140	Height (AGL):	140
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	3	Channel Count	2	Channel Count	2
Total TX Power(W):	61	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	2,569.48	ERP (W):	2,559.48	ERP (W):	2,559.48
Antenna A1 MPE%	0.51	Antenna B1 MPE%	0.51	Antenna C1 MPE%	0.51
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	140	Height (AGL):	140	Height (AGL):	140
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	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,002.81	ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A2 MPE%	1.40	Antenna B2 MPE%	1.40	Antenna C2 MPE%	1.40
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	140	Height (AGL):	140	Height (AGL):	140
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.37	Antenna B3 MPE%	0.37	Antenna C3 MPE%	0.37

Antenna #:	**4 (Microwave)**
Make / Model:	Fastback Networks IBR 1300
Gain:	10.0 dBd
Height (AGL):	140
Frequency Bands	5.0 GHz
Channel Count	1
Total TX Power(W):	1
ERP (W):	10 W
Antenna A4 MPE%	0.002

T-Mobile Sector A Total:	2.292%
T-Mobile Sector B Total:	2.29 %
T-Mobile Sector C Total:	2.29 %
Site Total:	2.292%

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.292%**
No Additional Carriers Listed in the CSC Active MPE Database	NA
Site Total MPE %:	**2.292%**

T-Mobile _Max Values per sector (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz UMTS	2	1,279.74	140	5.12	AWS - 2100 MHz	1000	0.51%
T-Mobile AWS - 2100 MHz LTE	2	1,167.14	140	4.67	AWS - 2100 MHz	1000	0.47%
T-Mobile PCS - 1900 MHz UMTS	2	1,167.14	140	4.67	PCS - 1900 MHz	1000	0.47%
T-Mobile PCS - 1900 MHz LTE	2	1,167.14	140	4.67	PCS - 1900 MHz	1000	0.47%
T-Mobile 700 MHz LTE	1	865.21	140	1.73	700 MHz	467	0.37%
T-Mobile 5 GHz Microwave	1	10	140	0.02	5 GHz Microwave	1000	0.002%
						Total:*	**2.292%**

*NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.292%
Sector B:	2.29%
Sector C:	2.29%
T-Mobile Per Sector Maximum:	2.292%
Site Total:	2.292%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.292%** of the allowable FCC established general population 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.

Exhibit F

CTHA029

FISKDALE
458 MAIN ST
FISKDALE
MA
01518-9998
2427030518
10/19/2017 (800)275-8777 1:22 PM

Product Description	Sale Qty	Final Price
PM 2-Day Flat Rate Env	1	$6.65
(Domestic)		
(ENFIELD, CT 06082)		
(Flat Rate)		
(Expected Delivery Day)		
(Saturday 10/21/2017)		
(USPS Tracking #)		
(9505 5112 4091 7292 0930 40)		
Insurance	1	$0.00
(Up to $50.00 included)		
PM 2-Day Flat Rate Env	1	$6.65
(Domestic)		
(ENFIELD, CT 06082)		
(Flat Rate)		
(Expected Delivery Day)		
(Saturday 10/21/2017)		
(USPS Tracking #)		
(9505 5112 4091 7292 0930 57)		
Insurance	1	$0.00
(Up to $50.00 included)		
PM 2-Day Flat Rate Env	1	$6.65
(Domestic)		
(ENFIELD, CT 06082)		
(Flat Rate)		
(Expected Delivery Day)		
(Saturday 10/21/2017)		
(USPS Tracking #)		
(9505 5112 4091 7292 0930 64)		
Insurance	1	$0.00
(Up to $50.00 included)		
Total		$19.95
Credit Card Remitd		$19.95
(Card Name:VISA)		
(Account #:XXXXXXXXXXXX7500)		
(Approval #:07669G)		
(Transaction #:081)		

Includes up to $50 insurance

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BRIGHTEN SOMEONE'S MAILBOX. Greeting cards available for purchase at select Post Offices.
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