



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Northeast Site Solutions  
Denise Sabo  
199 Brickyard Rd Farmington, CT 06032  
860-209-4690  
[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)

June 16, 2016

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

RE: Notice of Exempt Modification  
287 Main Street, East Hartford CT 06118  
Latitude: 41.74235  
Longitude: -72.63365  
T-Mobile Site#: CT11882H\_L700

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 80-foot level of the existing 23-foot roof mounted flagpole at 287 Main Street, East Hartford CT 06118. The 83-foot AGL flagpole is owned by South Grammar Office Complex LLC. The property is owned by South Grammar Office Complex LLC. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 700 MHz antennas. The new antennas would be installed at the 80-foot level of the flagpole.

**Planned Modifications:**

Remove: NONE

Remove and Replace:

(3) APX16DWV-16DWV-SE-A20 (REMOVE) - (3) Commscope DBXNH-6565B-A2M Antenna (**REPLACE**)  
(6)TWIN TMA (REMOVE) - (3)DUAL Diplex AWS TMA (**REPLACE**)

Install New:

(3) RRUS 11 B12 & (6) Diplexers on new H-Frame at **ground level (Mounted on existing steel platform)**

Existing to Remain:

(12) 1-5/8" Coax

This facility was approved by the CT Siting Council. Petition No.731 –T-Mobile would replace the existing flagpole tower with one that would be 23 feet all. The existing tower is 18" in diameter; The new tower would be 22" in diameter. T-Mobile's ground cabinets would be installed on concrete pad on the west side of the building behind an existing row of 12 to 18 foot tall arbor vitae.



# NSS NORTHEAST SITE SOLUTIONS

*Turnkey Wireless Development*

T-Mobile has received a height variance from the East Hartford ZBA for the proposed, higher tower. The city's planning and zoning commission asked T-Mobile to seek the Siting Council's approval rather than granting its own site plan approval.

Visibility of the new tower should be limited to the immediate vicinity of the building and from Route 2. Because it will be a flagpole, it should represent a negligible visual intrusion on the surrounding area.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mayor Marcia A Leclerc, Elected Official for the City of East Hartford, as well as the property owner and the tower owner.

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](mailto:denise@northeastsitesolutions.com)

Attachments

cc: Marcia A. Leclerc- Mayor - as elected official

South Grammar Office Complex LLC - as tower owner & property owner

# Exhibit A

# Connecticut Siting Council

## Petition Staff Reports

Petition No. 731  
Omnipoint/T-Mobile  
East Hartford, Connecticut  
Staff Report  
August 24, 2005

T-Mobile seeks to replace an existing 15-foot tall rooftop flagpole/telecommunications tower with a 23-foot tall flagpole tower at the top of which it would install its antennas. Council member Dan Lynch and staff person David Martin met with Steve Humes and several other T-Mobile representatives to conduct a field review of the proposal on August 22, 2005. The owner of the building on which the flagpole tower is located was also present.

The building is an old grammar school that has been renovated into commercial office space near the intersection of Main Street and Brewer Street. Route 2 runs just south of the building, and Rentschler Field is not far to the northeast. The surrounding area is primarily commercial and industrial with modest single family residences to the east and south of the site.

The building has a widow's walk at the top of its roof. Cingular has antennas attached to the sides of the widow's walk railing, and AT&T has antennas mounted inside the existing 15-foot tall flagpole tower. T-Mobile would replace the existing flagpole tower with one that would be 23 feet all. The existing tower is 18" in diameter; the new tower would be 22" in diameter. T-Mobile's ground cabinets would be installed on concrete pad on the west side of the building behind an existing row of 12 to 18 foot tall arbor vitae.

T-Mobile has received a height variance from the East Hartford ZBA for the proposed, higher tower. The city's planning and zoning commission asked T-Mobile to seek the Siting Council's approval rather than granting its own site plan approval.

Visibility of the new tower should be limited to the immediate vicinity of the building and from Route 2. Because it will be a flagpole, it should represent a negligible visual intrusion on the surrounding area.

Content Last Modified on 8/25/2005 2:51:23 PM

# Exhibit B

# Town of East Hartford Property Summary Report

## 287 MAIN ST

<b>MAP LOT:</b>	20-21A	<b>CAMA PID:</b>	8595
<b>LOCATION:</b>	287 MAIN ST		
<b>OWNER NAME:</b>	SOUTH GRAMMAR OFFICE COMPLEX LLC		



<b>OWNER OF RECORD</b>
SOUTH GRAMMAR OFFICE COMPLEX LLC
34 CONN BLVD
EAST HARTFORD, CT 06108



<b>LIVING AREA:</b>	21480	<b>ZONING:</b>	B1	<b>ACREAGE:</b>	1.07
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### SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
SOUTH GRAMMAR OFFICE COMPLEX LLC	1536/ 196	30-Sep-1994	\$0.00
DOWNEY E & WOLVERTON R & CYR L	940/ 174	08-Nov-1985	\$0.00
DOWNEY E WOLVERTON R & CYR L	165/ 643	06-Jan-1983	\$210,000.00

### CURRENT PARCEL ASSESSMENT

<b>TOTAL:</b>	\$972,150.00	<b>IMPROVEMENTS:</b>	\$896,730.00	<b>LAND:</b>	\$75,420.00
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### ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2015	\$972,150.00	\$896,730.00	\$75,420.00
2014	\$972,153.00	\$896,733.00	\$75,420.00
2013	\$972,153.00	\$896,733.00	\$75,420.00
2012	\$972,153.00	\$896,733.00	\$75,420.00
2011	\$972,153.00	\$896,733.00	\$75,420.00

# Town of East Hartford Property Summary Report

## 287 MAIN ST

<b>MAP LOT:</b>	20-21A	<b>CAMA PID:</b>	8595
<b>LOCATION:</b>	287 MAIN ST		
<b>OWNER NAME:</b>	SOUTH GRAMMAR OFFICE COMPLEX LLC		

### BUILDING # 1

<b>YEAR BUILT</b>	1915	<b>EXT WALL 1</b>	Brick
<b>STYLE</b>	Office	<b>INT WALLS 1</b>	Drywall
<b>MODEL</b>	Comm/Ind	<b>HEAT FUEL</b>	Other
<b>STORIES</b>	4.0	<b>HEAT TYPE</b>	Hot Water
<b>OCCUPANCY</b>	Office Building	<b>AC TYPE</b>	Central
<b>ROOF</b>	Hip	<b>BEDROOMS</b>	
<b>ROOF COVER</b>	Asphalt	<b>FULL BATHS</b>	0
<b>FLOOR COVER 1</b>	Metal	<b>HALF BATHS</b>	
<b>% BSMT</b>	null	<b>TOTAL ROOMS</b>	0
<b>% FIN BSMT</b>	null	<b>% REC RM</b>	null
<b>% SEMI FIN BSMT</b>	null	<b>% ATTIC FINISH</b>	null
<b>BSMT GARAGE</b>	null	<b>FIREPLACES</b>	null

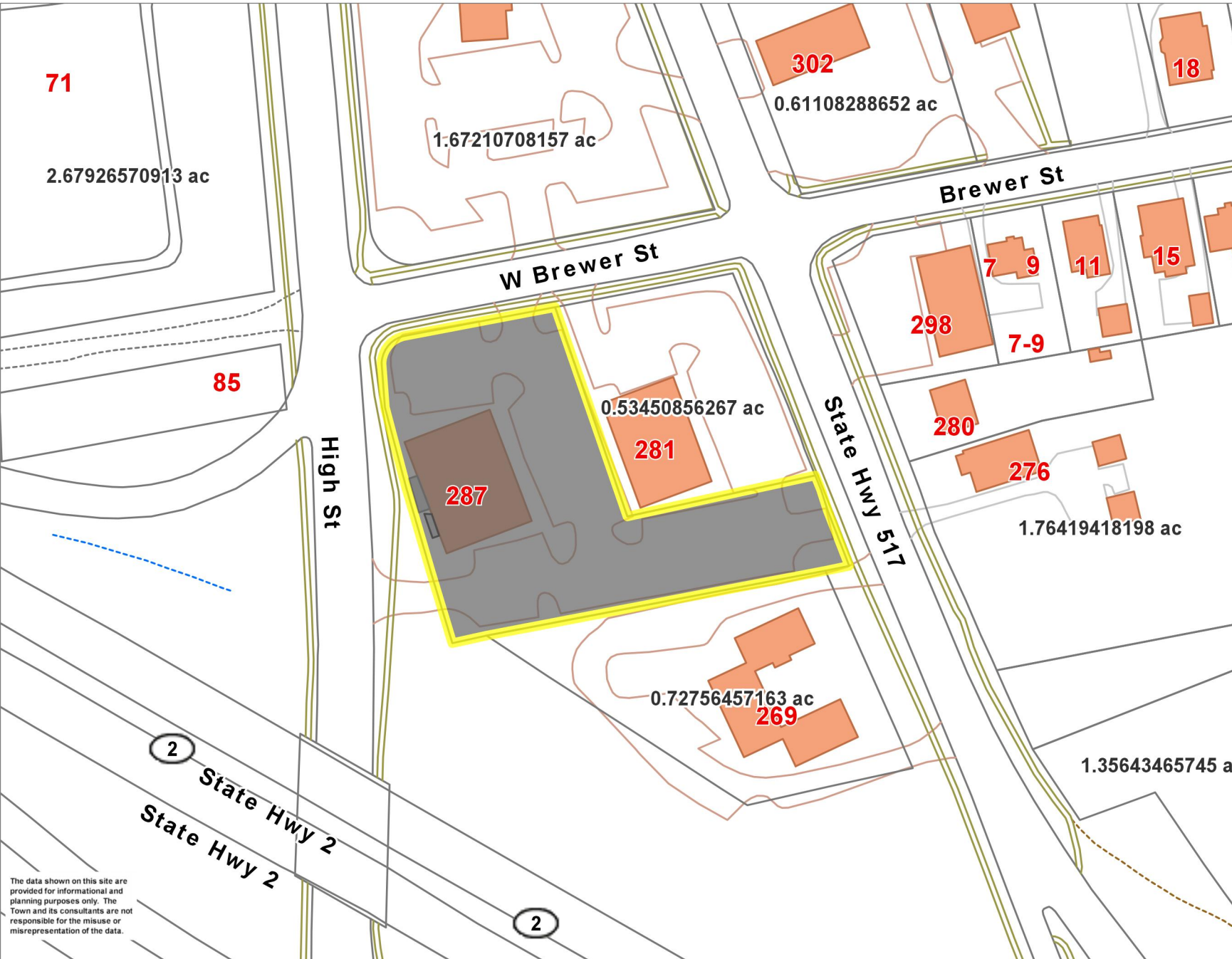


### EXTRA FEATURES

DESCRIPTION	CODE	UNITS
Elevator Pass	ELV1	1 UNITS

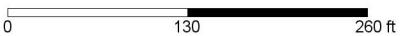
### OUTBUILDINGS

DESCRIPTION	CODE	UNITS
Paving	PAV1	1x12600 (12600 SF)



- Town Boundary
- Schools
- Buildings
  - Building
  - Cement
  - Deck
  - Foundation
  - Greenhouse
  - Tank
- Parcels
- Paved Features
  - Driveway
  - Road Edge
  - Parking Lot
  - Sidewalk
  - Trail
  - Tunnel
  - Unpaved
- Water Features Arc
  - Perennial Stream
  - Draining Ditch
  - Culvert
  - Spillway
  - Headwall
  - Dam
  - Directional Flow Arrow
- Water Features Poly
  - Open Water
  - Swamp
  - Pier
- CT Highways
  - Interstate
  - US Highway
  - State Highway
- Abutting Town Labels
- Abutting Towns
- Streets

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.



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# Exhibit C









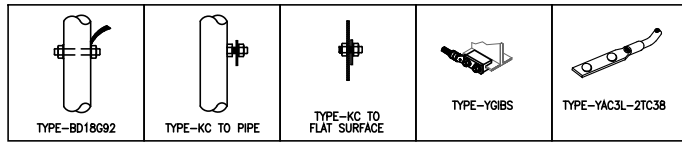








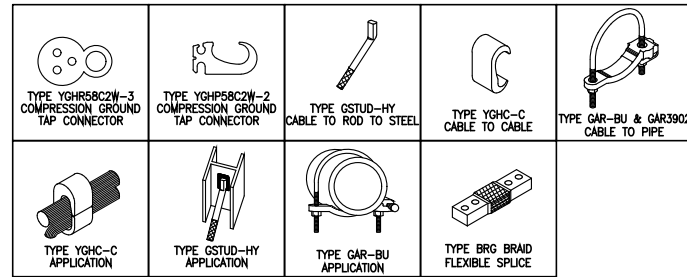




**BURNDY GROUNDING DETAILS**

SCALE: N.T.S

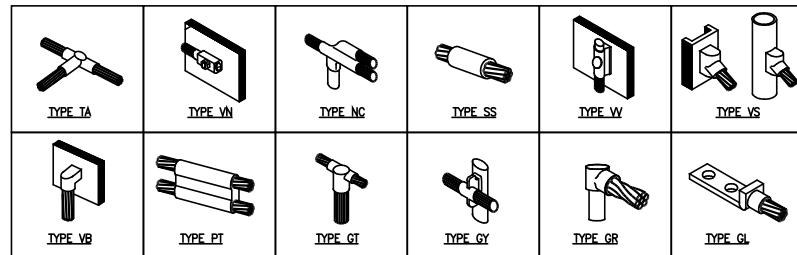
1  
E-2



**BURNDY GROUNDING PRODUCTS**

SCALE: N.T.S

2  
E-2



**CADWELD GROUNDING CONNECTION PRODUCTS**

SCALE: N.T.S

3  
E-2

TERMINATION TYPES:

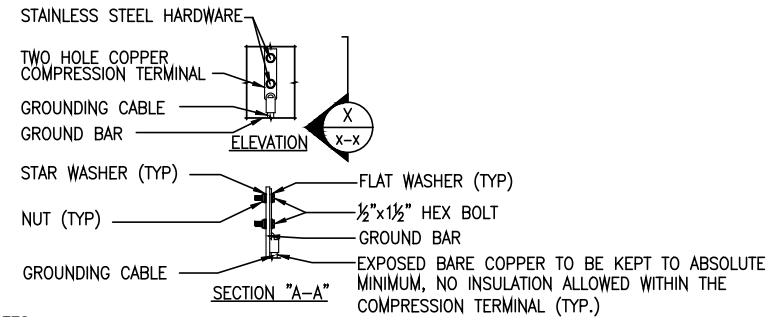
- A. MECHANICAL COMPRESSION LUG
- B. DOUBLE BARRELL COMPRESSION CONNECTOR
- C. EXOTHERMIC TERMINATION
- D. BEAM CLAMP

	SOLID #2 TINNED COPPER	#6 GROUND LEAD	#2/O STRANDED MAIN DOWN CONDUCTOR	MASTER GRND BAR	STRUCTURAL OR TOWER STEEL	BLDG SERVICE ENTR OR GRND RING	GROUND ROD
SOLID #2 TINNED COPPER	B OR C	B OR C					
#6 GROUND LEAD	B OR C						
#2/O STRANDED GRNDG ELECTRODE CONDUCTOR				A	A, C, OR D	A	
MASTER GROUND BAR	C	A	A				
STRUCTURAL OR TOWER STEEL	A, C, OR D	A, C, OR D	A, C, OR D				
GROUND RING	C		C				C

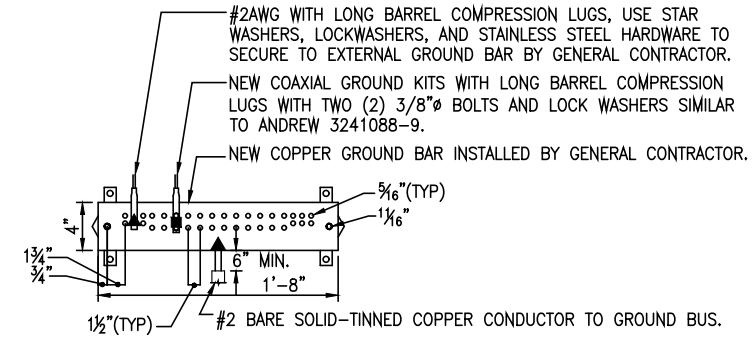
**GROUNDING TERMINATION MATRIX**

SCALE: N.T.S

7  
E-2



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

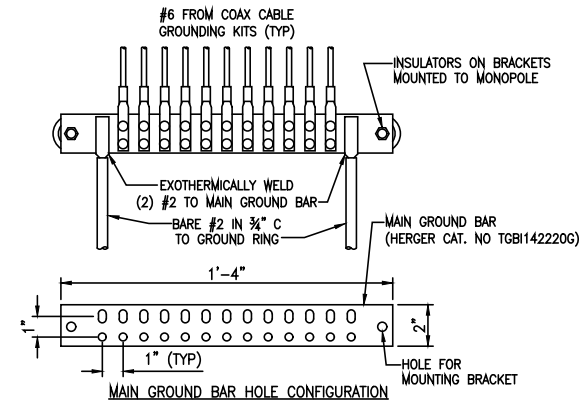


- NOTES:
- ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
  - FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
  - ALL HOLES ARE COUNTERSUNK 1/16".

**TYPICAL GROUND BAR CONNECTIONS DETAIL**

SCALE: N.T.S

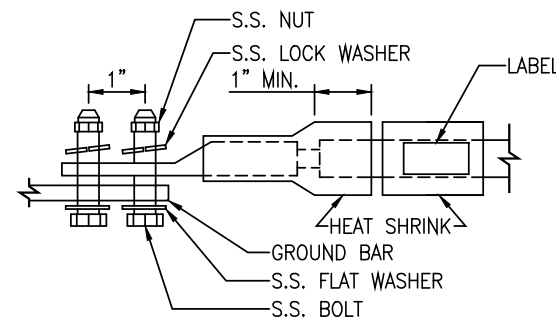
4  
E-2



**GROUND BAR DETAIL**

SCALE: N.T.S

5  
E-2



- LUG NOTES:
- ALL HARDWARE IS 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS.
  - ALL HARDWARE SHALL BE S.S. 3/8" Ø OR LARGER.
  - FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH ANTI-OXIDIZATION COMPOUND PRIOR TO MATING.

**GROUND BAR DETAIL**

SCALE: N.T.S

6  
E-2



T-MOBILE NORTHEAST, LLC  
35 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
OFFICE: (860) 692-7100  
FAX: (860) 692-7139



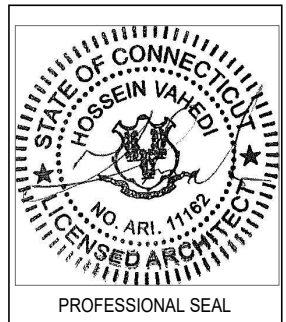
54 Jacqueline Road, Suite #7  
Waltham, MA 02452  
Phone number: 617-852-3811  
Fax Number: 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/27/16	ISSUED FOR REVIEW	A
06/16/16	FINAL CD	0

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

PROJECT NO: CT11882H  
DRAWN BY: FG  
CHECKED BY: KM



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SITE NUMBER  
CT11882H  
SITE NAME  
CT882/287 MAIN ST\_RT  
SITE ADDRESS  
287 MAIN STREET  
EAST HARTFORD, CT 06118

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
E-2



# Exhibit D

**STRUCTURAL ANALYSIS REPORT  
ROOFTOP**



Prepared For:



**35 Griffin Road South  
Bloomfield, CT 06002**



**Site ID: CT11882H**

**Site Name: CT882/287 Main ST\_RT**

**287 Main Street**

**East Hartford, CT 06108**

May 23, 2016

Submitted By:

Atlantis Design Group, Inc.  
54 Jacqueline Road, Suite #7  
Waltham, Massachusetts 02452  
Phone: 617-852-3611

**STRUCTURAL ANALYSIS REPORT  
ROOFTOP**



Prepared For:

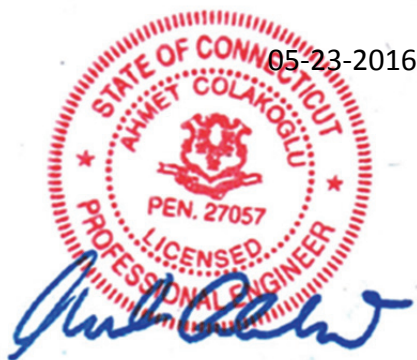
**T-Mobile**  
35 Griffin Road South  
Bloomfield, CT 06002

**RESULT: PASS**

**Site ID: CT11882H  
Site Name: CT882/287 Main ST\_RT  
287 Main Street  
East Hartford, CT 06108**

Prepared By:

**Destek Engineering, LLC  
Professional Engineering Corporation  
License # PEC 001429**



Ahmet Colakoglu, P.E.  
Connecticut Professional Engineer  
License No: 27057

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1.0 – SUBJECT AND REFERENCES

1.1 – STRUCTURE

2.0 – EXISTING AND PROPOSED APPURTENANCES

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STRUCTURES

5.0 - ANALYSIS AND ASSUMPTIONS

6.0 – RESULTS AND CONCLUSION

APPENDIX

A – CALCULATIONS

**1.0 SUBJECT AND REFERENCES**

The purpose of this analysis is to evaluate the structural capacity of the wireless telecommunication installation on the existing building located at 287 Main Street, East Hartford, CT 06108 for additions and alterations proposed by T-Mobile.

The structural analysis is based on the following documentation provided to Destek Engineering, LLC (Destek):

- RFDS provided by T-Mobile, dated 04/20/2016.
- Structural Evaluation Letter prepared by URS Corporation, dated 04/28/2009.
- Construction drawing by HPC Development, LLC, dated 01/27/2009.

**1.1 STRUCTURE**

This subject structure is a (4) story building. Currently, T-Mobile has (3) antennas concealed inside a 23 foot tall flag pole constructed from RF friendly concealment cylinders supported by wood members. The RAD center of the antennas is 80 feet AGL. Please refer to the calculations in Appendix A for additional details.

**2.0 EXISTING AND PROPOSED APPURTENANCES**

**Existing Configuration of T-Mobile Appurtenances:**

RAD Center (ft.)	Appurtenances	Mount
80	(3) APX16DWV-16DWV-S-E-A20 (6) TMAs	Inside flagpole

**Proposed and Final Configuration of T-Mobile Appurtenances:**

RAD Center (ft.)	Appurtenances	Mount
80	(3) DBXNH6565A-A2M (3) TMAs	Inside flagpole

### **3.0 CODES AND LOADING**

The analysis is in accordance with the following codes and loading as adopted in Connecticut:

- *2005 State Building Code* with all of the adopted Addendums and Supplements.
- *Minimum Design Loads for Buildings and Other Structures SEI/ASCE 7-02*, American Society of Civil Engineers
- *Specifications for Structural Steel Buildings – Allowable Stress ANSI/AISC 335-89s1*, American National Standards Institute/American Institute for Steel Construction
- Building Classification: II
- Basic Wind Speed: 95 mph
- Exposure: B

### **4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES**

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure and the foundation system are assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed additions and alterations. Any deviation of the proposed equipment and placement, etc., will require Destek to generate an additional structural analysis.

### **5.0 ANALYSIS AND ASSUMPTIONS**

The structure is considered to have adequate strength for the proposed loading if the existing structural members that will be used to support the proposed equipment are structurally adequate per the applicable Code criteria or if the additions or alterations to the existing structure do not increase the force in any structural element by more than 5%, in accordance with the applicable referenced Code.

This analysis was performed by utilizing Risa 3-D, a commercially available structural engineering software package by Risa Technologies, as applicable.

## 6.0 **RESULTS AND CONCLUSION**

**Flagpole:** The existing flagpole is considered to have **adequate** structural capacity for the proposed changes by T-Mobile. The proposed antennas will be enclosed within the RF friendly concealment cylinders, similar to the existing antennas to be removed. Therefore, the proposed antennas do not increase the wind forces on the flagpole and the previous analysis is this valid.

**Building Roof:** The building is found to have **adequate** structural capacity for the proposed changes by T-Mobile. Under controlling load combinations and as a maximum, the wooden truss members are stressed to **93.5%** of their structural capacity.

Therefore, the proposed additions by T-Mobile **can** be implemented as intended and with the conditions outlined in this report.

Should you have any questions about this report, please contact us at (770) 693-0835.

**APPENDIX A  
CALCULATIONS**



**PURPOSE**

The purpose of these calculations is to determine whether the building located at 287 Main Street, East Hartford, CT 06108, has adequate structural capacity for proposed changes by T-Mobile.

All calculations in accordance with 2005 Connecticut Building Code, with 2009 supplement.

**Wind Load**

reference Connecticut Building Code 2005 With 2009 Amendment section - Appendix R

**Input:**

Location:	East Hartford, CT	<a href="#">ASCE 7 Reference</a>
Classification:	II	table 1-1 pg 4
Equipment height:	z := 80 ft	
Exposure category:	Exp := "B"	section 6.5.6.2 pg. 28

$$z_g := \begin{cases} 1200 & \text{if Exp} = \text{"B"} \\ 900 & \text{if Exp} = \text{"C"} \\ 700 & \text{if Exp} = \text{"D"} \end{cases} = 1.2 \times 10^3 \quad \alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} = 7$$

Velocity pressure exposure coefficient:

$$K_z := 2.01 \cdot \left( \frac{z}{z_g} \right)^{\frac{2}{\alpha}} = 0.927$$

table 6-3 pg 75

Topographic factor:	$K_{zt} := 1.0$	section 6.5.7.2 pg. 30
Wind directional factor:	$K_d := 0.85$	table 6-4 pg. 76
Basic wind speed:	V := 95 mph	figure 6-1C pg. 40
Importance factor:	I := 1.00	table 6-1 pg 73
Gust response factor:	G := 0.85	section 6.5.84

**Velocity Pressure:**  $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot \text{psf}$   $q_z = 18.21 \cdot \text{psf}$  equation (6-15)

**Force Coefficients:**

$$C_{F\_flat} := \begin{pmatrix} 1 & 1.3 \\ 7 & 1.4 \\ 25 & 2 \end{pmatrix} \quad C_{F\_round} := \begin{pmatrix} 1 & 0.7 \\ 7 & 0.8 \\ 25 & 1.2 \end{pmatrix} \quad \text{Figure (6-19), Pg 69}$$

Loads on Flagpole

$$C_f := 1.1$$

$$\text{Width} := 1.83 \text{ ft}$$

$$F_{P2.0} := q_z \cdot G \cdot C_f \cdot \text{Width} = 31.156 \cdot \text{plf}$$

Loads on Flag

$$G := 1.14$$

$$C_h := 1.24$$

$$\text{Width}_{\text{Flag}} := 10 \text{ ft}$$

$$\text{Length}_{\text{Flag}} := 15 \text{ ft}$$

$$\text{Area}_{\text{Flag}} := \text{Width}_{\text{Flag}} \cdot \text{Length}_{\text{Flag}} = 150 \text{ ft}^2$$

$$F_{\text{Flag}} := 0.0014 \cdot (V)^2 \cdot \sqrt{\frac{\text{Area}_{\text{Flag}}}{\text{ft}^2}} \cdot C_h \cdot G \cdot \text{lbf} = 218.75 \text{ lbf}$$

Loads on Existing Antennas (DBXNH6565A-A2M):

$$\text{Dimensions: } H := 55.9 \text{ in } \quad W := 13.3 \text{ in } \quad D := 3.15 \text{ in } \quad W_{\text{ant1}} := 40.7 \text{ lbf}$$

ALL ANTENNAS ARE WITHIN RF FRIENDLY CONCEALMENT CYLINDERS  
THEREFORE SHIELDED

Front:

$$\text{Area} := H \cdot W = 5.163 \text{ ft}^2$$

$$C_f := \text{linterp}\left(C_{F\_flat}^{(0)}, C_{F\_flat}^{(1)}, \frac{H}{W}\right) = 1.353$$

Figure (6-19), Pg 69

$$F_{\text{ant1\_front}} := 0q_z \cdot G \cdot C_f \cdot \text{Area} = 0 \cdot \text{lbf}$$

Equation (6-15)

Side:

$$\text{Area} := H \cdot D = 1.223 \text{ ft}^2$$

$$C_f := \text{linterp}\left(C_{F\_flat}^{(0)}, C_{F\_flat}^{(1)}, \frac{H}{D}\right) = 1.758$$

Figure (6-19), Pg 69

$$F_{\text{ant1\_side}} := 0q_z \cdot G \cdot C_f \cdot \text{Area} = 0 \cdot \text{lbf}$$

Equation (6-15)

**Loads on Proposed Antennas (DBXNH6565A-A2M):**

Dimensions: H := 63.3in W := 16.1in D := 11.6in W<sub>ant2</sub> := 60.0lbf

ALL ANTENNAS ARE WITHIN RF FRIENDLY CONCEALMENT CYLINDERS  
THEREFORE SHIELDED

Front:

$$\text{Area} := H \cdot W = 7.077 \text{ ft}^2$$

$$C_f := \text{linterp}\left(C_{F\_flat}^{(0)}, C_{F\_flat}^{(1)}, \frac{H}{W}\right) = 1.349$$

Figure (6-19), Pg 69

$$F_{ant2\_front} := 0q_z \cdot G \cdot C_f \cdot \text{Area} = 0 \cdot \text{lbf}$$

Equation (6-15)

Side:

$$\text{Area} := H \cdot D = 5.099 \text{ ft}^2$$

$$C_f := \text{linterp}\left(C_{F\_flat}^{(0)}, C_{F\_flat}^{(1)}, \frac{H}{D}\right) = 1.374$$

Figure (6-19), Pg 69

$$F_{ant2\_side} := 0q_z \cdot G \cdot C_f \cdot \text{Area} = 0 \cdot \text{lbf}$$

Equation (6-15)

**Dead Load**

Maximum Vertical Load from URS Analysis:  $P_y := 2 \cdot 1.65 \text{ kip}$

Previous Antenna Weight:  $W_{ant\_existing} := 3 \cdot W_{ant1} + 3 \cdot 20 \text{ lbf} = 182.1 \text{ lbf}$

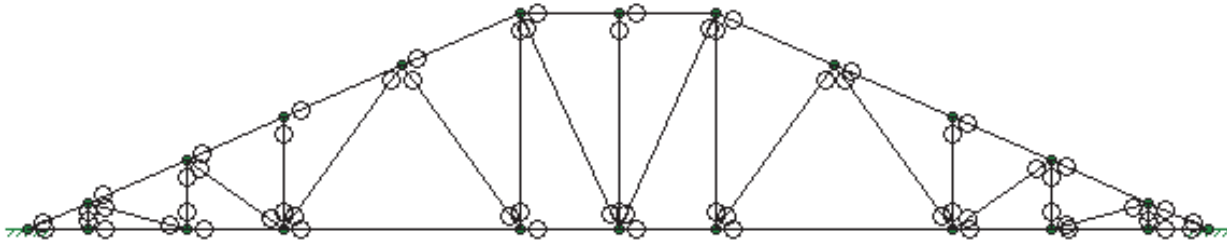
Weight of the Pole:  $W_{Pole} := P_y - W_{ant\_existing} = 3.118 \cdot \text{kip}$

Weight of the Proposed Antennas:  $W_{ant\_proposed} := 3 \cdot W_{ant2} + 15 \cdot 20 \text{ lbf} = 480 \text{ lbf}$

$$\text{Increase} := \frac{W_{ant\_proposed}}{W_{Pole}} = 15.395 \cdot \%$$

$$P_{proposed} := W_{Pole} + W_{ant\_proposed} = 3.598 \cdot \text{kip}$$

Truss Check



Member	S...		Axial[k]	LC	y Shear[k]	L...
M1	1	max	11.599	3	.12	2
		min	2.894	2	.12	1

Maximum Axial Compression Load:  $C_{max} := 11.599\text{kip}$

Allowable Compression in member:  $C_{allow} := 12.4\text{kip}$

$$\frac{C_{max}}{C_{allow}} = 93.5\% \quad \text{OK}$$

Member	S...		Axial[k]	LC	y Shear[k]	L...
M23	1	max	-.27	3	0	1
		min	-1.921	1	0	1

Maximum Axial Tensile Load:  $T_{max} := 1.921\text{kip}$

Allowable Tension in member:  $T_{allow} := 4.33\text{kip}$

$$\frac{T_{max}}{T_{allow}} = 44.4\% \quad \text{OK}$$

# Exhibit E

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

**T-Mobile Existing Facility**

**Site ID: CT11882H**

**CT882/287 Main St\_RT  
287 Main Street  
East Hartford, CT 06118**

**June 14, 2016**

**EBI Project Number: 6216002747**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>9.69 %</b>

June 14, 2016

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

Emissions Analysis for Site: **CT11882H – CT882/287 Main St\_RT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **287 Main Street, East 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 **287 Main Street, East 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 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 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.
- 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) Since the radios are ground mounted there are additional cabling losses accounted for. For each RF path the following losses were calculated. 0.89 dB of additional cable loss for all 700 MHz Channels, 1.64 dB of additional cable loss for all 1900 MHz channels and 1.69 dB of additional cable loss for all 2100 MHz channels. This is based on manufacturers Specifications for 159 feet of 1-5/8" coax cable on each path.
- 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 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.
- 9) The antennas used in this modeling are the **Andrew DBXNH-6565A-VTM** for 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Andrew DBXNH-6565A-VTM** has a maximum gain of **11.3 dBd** at its main lobe at 700 MHz, 15.5 dBd at its main lobe at 1900 MHz and 15.0 dBd at 2100 MHz. 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 **80 feet** above ground level (AGL).
- 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.

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:	Andrew DBXNH-6565A-VTM	Make / Model:	Andrew DBXNH-6565A-VTM	Make / Model:	Andrew DBXNH-6565A-VTM
Gain:	11.3 dBd / 15.5 dBd / 15 dBd	Gain:	11.3 dBd / 15.5 dBd / 15 dBd	Gain:	11.3 dBd / 15.5 dBd / 15 dBd
Height (AGL):	80	Height (AGL):	80	Height (AGL):	80
Frequency Bands	700 MHz / 1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	700 MHz / 1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	700 MHz / 1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	9	Channel Count	9	Channel Count	9
Total TX Power(W):	330	Total TX Power(W):	330	Total TX Power(W):	330
ERP (W):	10,589.06	ERP (W):	10,589.06	ERP (W):	10,589.06
Antenna A1 MPE%	5.03	Antenna B1 MPE%	5.03	Antenna C1 MPE%	5.03

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	5.03 %
AT&T	3.66 %
MetroPCS	1.00 %
<b>Site Total MPE %:</b>	<b>9.69 %</b>

T-Mobile Sector 1 Total:	5.03 %
T-Mobile Sector 2 Total:	5.03 %
T-Mobile Sector 3 Total:	5.03 %
<b>Site Total:</b>	<b>9.69 %</b>

T-Mobile _Max 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	1285.73	80	16.88	2100	1000	1.69 %
T-Mobile 1900 MHz (PCS) GSM	2	729.66	80	9.58	1900	1000	0.96 %
T-Mobile 1900 MHz (PCS) UMTS	2	729.66	80	9.58	1900	1000	0.96 %
T-Mobile 2100 MHz (AWS) UMTS	2	729.66	80	9.58	2100	1000	0.96 %
T-Mobile 700 MHz LTE	1	329.70	80	2.16	700	467	0.46 %
						<b>Total:</b>	<b>5.03 %</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:	5.03 %
Sector 2:	5.03 %
Sector 3:	5.03 %
T-Mobile Per Sector Maximum:	5.03 %
Site Total:	9.69 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **9.69%** 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.

### Proposed Safety Plan

The proposed site involves a stealth flagpole transmitting over a rooftop. This subject structure is a (4) story building. Currently, T-Mobile has (3) antennas concealed inside a 23-foot flag pole constructed from RF friendly concealment cylinders supported by wood members. The RAD center of the antennas is 80 feet AGL. For purposes of T-Mobile signage policy, the roof top is considered to be the nearest walking/working surface and equivalent to ground level. As per the T-Mobile signage policy, the following signage is recommended.

	Blue “Notice” Sign	Post at access point to site (next to roof top compound access gate)
	Yellow “Guidelines” Sign	Post adjacent to the NOTICE sign at the access point

No further RF mitigation measures are required.