



June 18<sup>th</sup>, 2018

Melanie A. Bachman Executive  
Director Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**Re:** Notice of Exempt Modification – Antenna and RRU Add  
**Property Address:** 126 Pioneer Heights Road, Somers, CT 06071  
**Applicant:** AT&T Mobility, LLC

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 136-feet on an existing 161-foot self-support tower, owned by Crown Castle at 3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065. AT&T now intends to remove one (1) 8' Andrew SBNH-1D6565C antenna and (2) 8' Powerwave P65-17-XLH-RR Panel Antennas, each currently located in position [4] all sectors, and swap these for three (3) 8' CCI TPA-65R-LCUUUU-H8, each to be installed in position [4] all sectors. In addition, AT&T intends to swap one (1) RRUS-12 A2 in position [2] with one (1) RRUS-32 B2, in each sector, for a total of three (3) RRUs to be swapped. Furthermore, AT&T is will be adding two (2) additional RRUs-32 in position [4] all sectors, for a total of six (6) RRUs to be added. AT&T is also proposing to add (1) Raycap Squid, as well as one (1) fiber line and (2) DC Power Cables to their equipment configuration. All of the changes will take place on the existing antenna mount.

Per the attached Decision and Order, the construction of the aforementioned self-support tower was approved by the Connecticut Siting Council on July 11<sup>th</sup>, 1986. Please see the attached Decision and Order for conditions.

Attached is a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Please accept this letter pursuant to Regulation 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., a copy of this letter is being sent to Jennifer Roy – Zoning Enforcement Officer, Town of Somers, CT at 600 Main St. Somers, CT 06071 and C.G. 'Bud' Knorr, Jr. – First Selectman, Town of Somers, CT at 600 Main St. Somers, CT 06071. A copy of this letter is being sent to the property owner, Lena G. & Gately Faye Farnham, 126 Pioneer Heights Rd. Somers, CT 06071 and to the tower company, Crown Castle at 3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-CING-025-034-088-129-145-166-070612** - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 1119 Summit Road, Cheshire; 48 Newtown Road, Danbury; 585 So. Main Street (a/k/a New Haven Road), Naugatuck; 126 Pioneer Heights Road, Somers; 23 Holland Road, Union; and 347 East Street, Wolcott, Connecticut.
- **EM-CING-129-120723** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 126 Pioneer Heights Road, Somers, Connecticut.
- **EM-AT&T-129-160226** - AT&T notice of intent to modify an existing telecommunications facility located at 126 Pioneer Heights Road, Somers, Connecticut.
- **EM-AT&T-129-160818** - AT&T notice of intent to modify an existing telecommunications facility located at 126 Pioneer Heights Road, Somers, Connecticut.



The planned modifications to AT&T's 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 tower. AT&T's replacement antennas will be installed at the 136-foot level of the 161-foot self-support tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

Romina Kirchmaier

CC w/enclosures:

Jennifer Roy – Zoning Enforcement Officer, Town of Somers, CT  
C.G. 'Bud' Knorr, Jr. – First Selectman, Town of Somers, CT  
Lena G. & Gately Faye Farnham – Property Owners  
Crown Castle – Tower Company

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR  
COPANY FOR A CERTIFICATE OF  
ENVIRONMENTAL COMPATIBILITY AND PUBLIC  
NEED FOR THE CONSTRUCTION, MAINTENANCE,  
AND OPERATION OF FACILITIES TO PROVIDE  
CELLULAR SERVICE IN HARTFORD, TOLLAND AND  
MIDDLESEX COUNTIES.

CONNECTICUT SITING  
COUNCIL

July 11, 1986.

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

- 1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.
- 2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.
- 3) The Portland and Rocky Hill towers shall be monopoles.
- 4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of
  - a) 193' at the Haddam site;
  - b) 173' at the Portland site;

- c) 153' at the Rocky Hill site;
- d) 173' at the Somers site;
- e) 173' at the Vernon site;
- f) 153' at the Willington site;
- g) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decision shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile (applicant)  
5 Eversley Avenue  
Norwalk, Connecticut 06855  
ATTN: Armand Mascioli  
General Manager

Howard L. Slater, Esq. (its attorneys)  
Scott A. Gursky, Esq.  
Byrne, Slater, Sandler,  
Shulman & Rouse, P.C.  
111 Pearl Street  
Hartford, Connecticut 06103

Richard Rubin, Esq.  
Fleischman and Walsh, P.C.  
1725 N Street, N.W.  
Washington, D. C. 20036

Mr. William Wamester  
1225 Randolph Road  
Middletown, Connecticut 06457

The Southern New England Telephone Company  
227 Church Street  
New Haven, Connecticut 06506  
ATTN: Peter J. Tyrrell, Esq.

Mr. James W. Tilney

represented by:  
Patricia A. Ayars  
Samuel Baily, Jr.  
Robinson & Cole  
One Commercial Plaza  
Hartford, CT. 06103-3597

Mr. Samuel DuBosar, Chairman  
Bessie Bennett, Esq.  
Town Plan & Zoning Commission  
P.O. Box 337  
Bloomfield, Connecticut 06002

Town of Somers

represented by:

Mr. Robert F. Peters  
Town Counsel  
Tatoian, Devline, Peters  
& Davis  
11 South Road  
P.O. Box 415  
Somers, CT. 06071

Town of Haddam  
represented by:

Lucy R. Petrella  
Chairperson  
Town Office Building  
Route 9A  
P.O. Box 87  
Haddam, CT. 06438

Midstate Regional Planning Agency

represented by:

Thomas M. Gilligan  
Regional Planner  
P.O. Box 139  
Middletown, CT. 06457

Dr. Donald P. LaSalle  
Director  
Talcott Mountain Science Center  
Montevideo Road  
Avon, Connecticut 06001

Barnard Tilson (service waived)  
Secretary  
Avon Planning and Zoning  
60 West Main Street  
Avon, Connecticut 06001

Alden Giddings  
33 Privelege Road  
Bloomfield, Connecticut 06002

Town of Bloomfield

represented by:

Joseph M. Suggs, Jr.  
Deputy Mayor  
Town Hall  
880 Bloomfield Avenue  
P.O. Box 337  
Bloomfield, CT. 06002  
(service waived)

Town of Middlefield

represented by:

David Silverstone, Esq.  
Silverstone & Koontz  
37 Lewis Street  
Hartford, CT. 06103

with a copy to:

Geoffrey Colegrove  
Midstate Regional Planning Agency  
100 DeKoven Drive  
Middletown, CT. 06457

Zoning Commission  
Town of Somers

represented by:

Joseph A. Paradis  
Chairman  
Town Hall  
600 Main Street  
P.O. Box 803  
Somers, CT. 06071



Barbara Sirwilo, Secretary (service waived)  
Planning & Zoning Commission  
Town of Rocky Hill  
600 Old Main Street  
P.O. Box 657  
Rocky Hill, Connecticut 06067

H. Robert Goodrich (service waived)  
Goodrich Lane  
Portland, Connecticut 06480

The Honorable Richard P. Antonetti  
State Representative (service waived)  
5 Sachem Circle  
Meriden, Connecticut 06450

John Hevrin  
R.D. #1 - Plains Road  
Haddam, Connecticut 06438

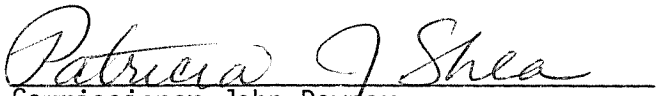



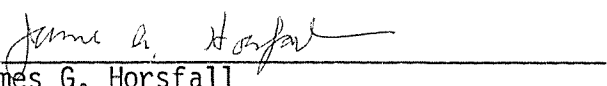
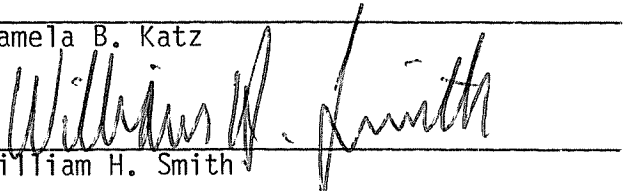
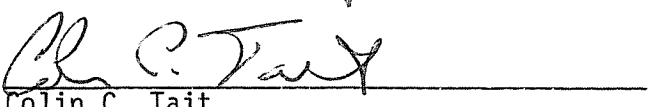
Norman and Darlene Manning (represented by)

Elizabeth Allen, Esq.  
P.O. Box 467  
Higganum, CT. 06441  
(service waived)

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:


Dated at New Britain, Connecticut, this 11th day of July, 1986.

<u>Council Members</u>	<u>Vote Cast</u>
_____) Gloria Dibble Pond Chairperson	Absent
 _____) Commissioner John Downey Designee: Patricia Shea	Yes
 _____) Commissioner Stanley Pac Designee: Christopher Cooper	Yes
 _____) Owen L. Clark	Yes
 _____) Mortimer A. Gelston	Yes
 _____) James G. Horsfall	Yes
_____) Pamela B. Katz	Absent
 _____) William H. Smith	Yes
 _____) Colin C. Tait	Yes

STATE OF CONNECTICUT            )  
  :  
COUNTY OF HARTFORD            )        ss.        New Britain, July 11, 1986

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

  
\_\_\_\_\_  
Christopher S. Wood, Executive Director  
Connecticut Siting Council



8618 Westwood Center Drive, Suite 315, Vienna, VA 22182  
703.276.1100 • 703.276.1169 fax  
info@sitesafe.com • www.sitesafe.com



**Smartlink on behalf of  
AT&T Mobility LLC  
Site FA – 10035066  
Site ID – CT1079 (MRCTB025139-  
MRCTB025241-MRCTB025332)  
USID – 59368  
Site Name – SOMERS**

**126 PIONEER HEIGHTS ROAD  
SOMERS, CT 06071**

Latitude: N41-56-55.97  
Longitude: W72-29-31.60  
Structure Type: Self-Support

Report generated date: May 21, 2018  
Report by: Zyotty Thamsil  
Customer Contact: Romina Kirchmaier

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**AT&T Mobility LLC will be compliant when the  
remediation recommended in Section 5.2 or  
other appropriate remediation is implemented.**

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# 1 General Site Summary

## 1.1 Report Summary

AT&T Mobility LLC	Summary
Access to Antennas Locked?	No
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant
Optional AT&T Mitigation Items?	No










The following documents were provided by the client and were utilized to create this report:

**RFDS:** NEW-ENGLAND\_CONNECTICUT\_CTV1079\_2018-LTE-Next-Carrier\_LTE\_rx855w\_2051A0CZQW\_10035066\_59368\_06-13-2017\_Final-Approved\_v1.00

**CD's:** 10035066\_AE201\_171016\_CTL01079\_REV1

**RF Powers Used:** NEW-ENGLAND\_CONNECTICUT\_CTV1079\_2018-LTE-Next-Carrier\_LTE\_rx855w\_2051A0CZQW\_10035066\_59368\_06-13-2017\_Final-Approved\_v1.00

## 1.2 Signage Summary

AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]
Alpha	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]
Beta	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]
Gamma	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]

## 1.3 Fall Arrest Anchor Point Summary

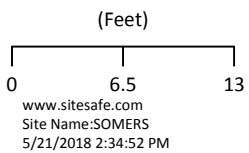
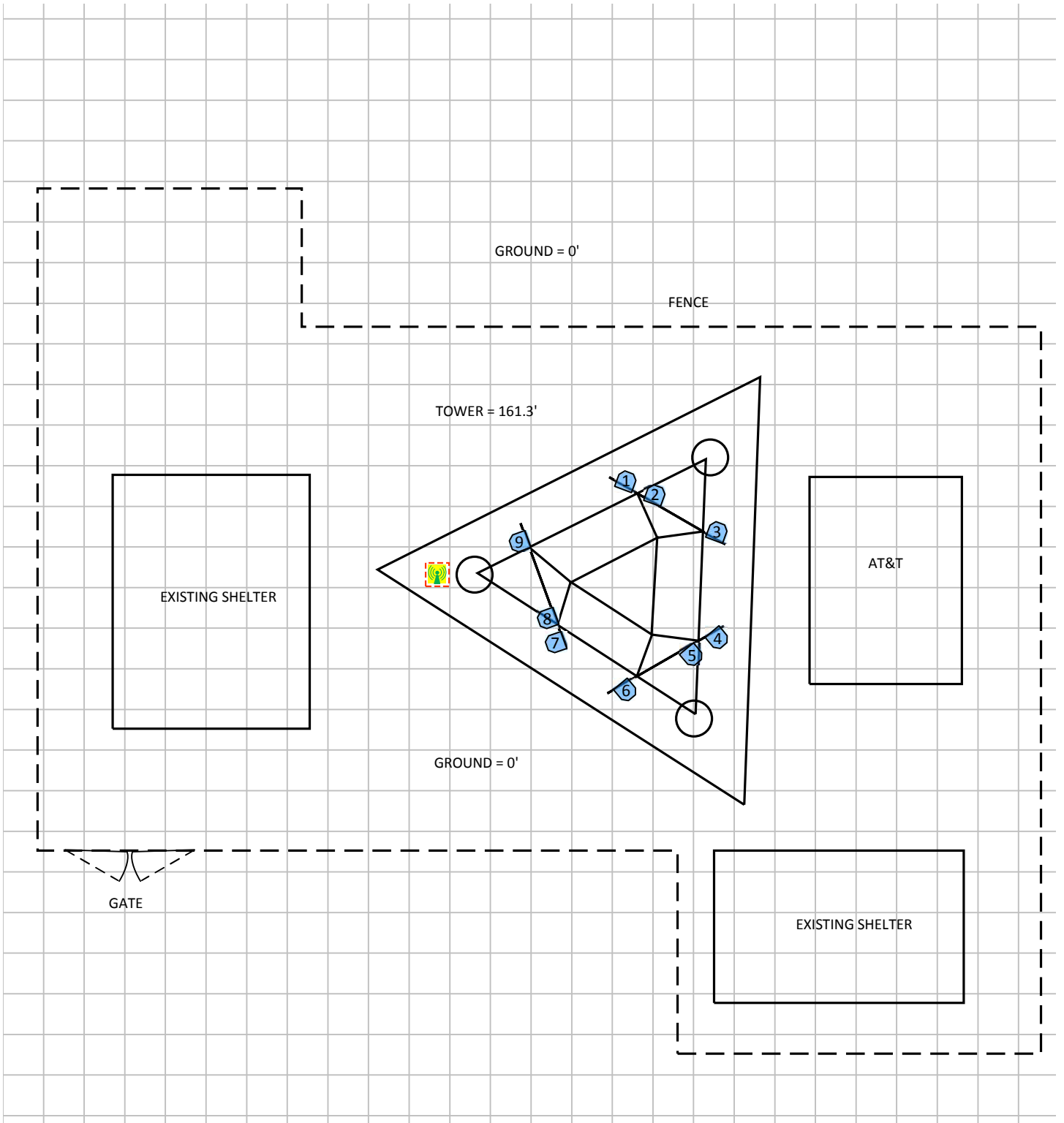
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	N/A	N

## 2 Scale Maps of Site

The following diagrams are included:

- ) Site Scale Map
- ) RF Exposure Diagram
- ) RF Exposure Diagram – Elevation View

# Site Scale Map For: SOMERS



Carrier Identification					
	AT&T MOBILITY LLC		VERIZON WIRELESS		T-MOBILE
	SPRINT		UNKNOWN CARRIER		
Sign Legend					
	Caution 1		Caution 2		Notice 2
	Notice 1		Warning		Warning 2
	Info 1		RSP		Info 2
Barrier			Proposed Barriers/ Signs		



### 3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	20	82	4.6	11.51	1	0	276.1	60.3'	83.3'	133.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	20	86	4.6	13.41	1	0	388.1	60.3'	83.3'	133.7'
2	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	737	20	64.9	7.7	13.26	0	1	1475.7	63'	82'	132.2'
2	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	20	63.1	7.7	14.76	0	2	4842.1	63'	82'	132.2'
3	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	20	65.2	8	13.96	0	1	5070.3	68.7'	78.6'	132'
3	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2300	20	65	8	14.36	0	1	1285.3	68.7'	78.6'	132'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	140	82	4.6	11.51	1	0	276.1	68.8'	68.7'	133.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	140	86	4.6	13.41	1	0	388.1	68.8'	68.7'	133.7'
5	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	737	140	64.9	7.7	13.26	0	1	1475.7	66.4'	67.1'	132.2'
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	140	63.1	7.7	14.76	0	2	4842.1	66.4'	67.1'	132.2'
6	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	140	65.2	8	13.96	0	1	5070.3	60.3'	63.9'	132'
6	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	140	65.2	8	13.96	0	1	1285.3	60.3'	63.9'	132'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	250	82	4.6	11.51	1	0	276.1	53.8'	68.3'	133.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	250	86	4.6	13.41	1	0	388.1	53.8'	68.3'	133.7'
8	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	737	250	64.9	7.7	13.26	0	1	1475.7	53.1'	70.5'	132.2'
8	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	250	63.1	7.7	14.76	0	2	4842.1	53.1'	70.5'	132.2'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
9	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	250	65.2	8	13.96	0	1	5070.3	50.5'	77.6'	132'
9	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2300	250	65	8	14.36	0	1	1285.3	50.5'	77.6'	132'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed.

**Note:** The 1900 MHz LTE technology is being added to an existing antenna.

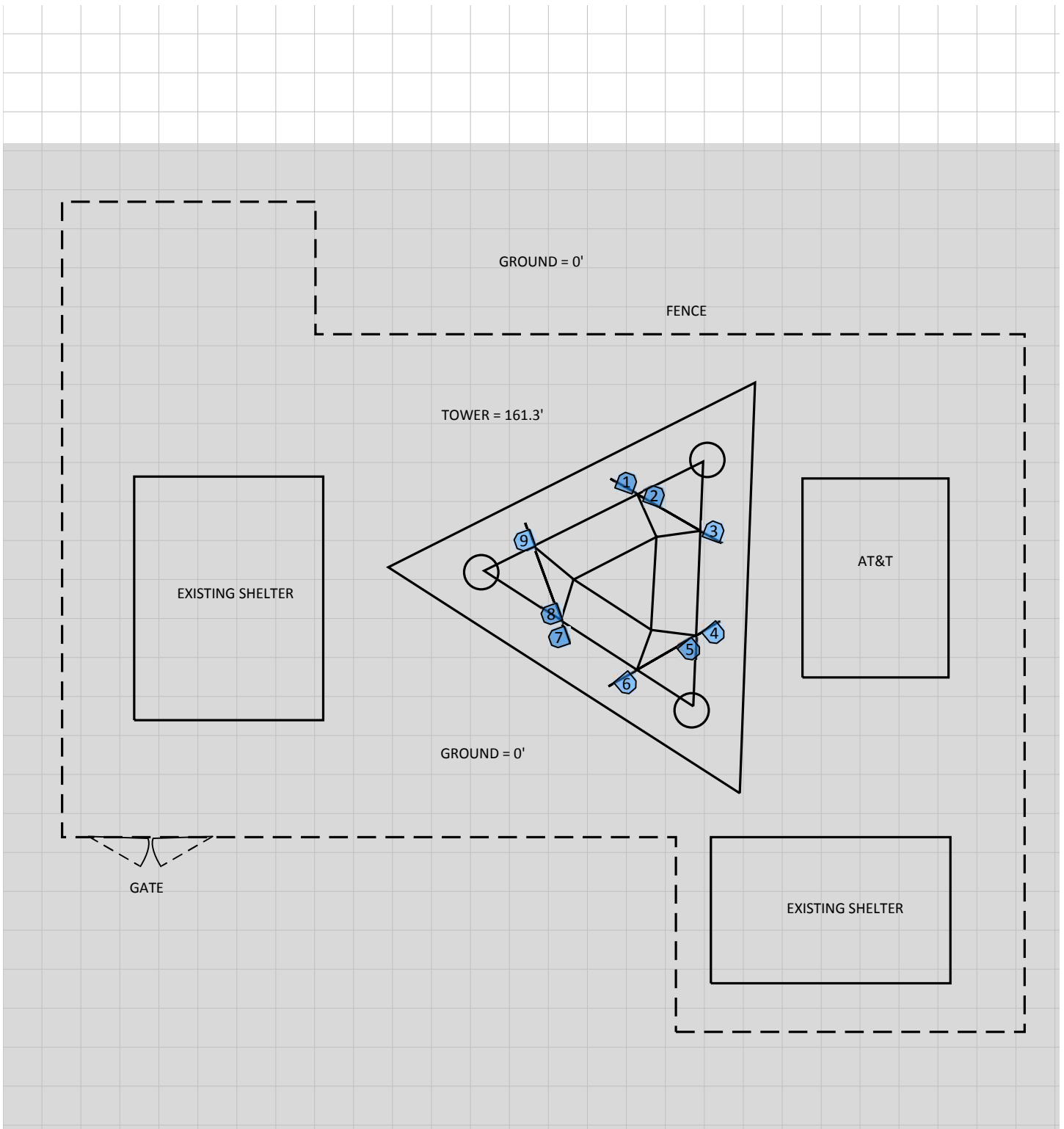
## 4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas. The total analyzed elevations in the below RF Exposure Simulations are listed below.

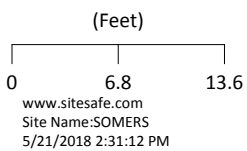
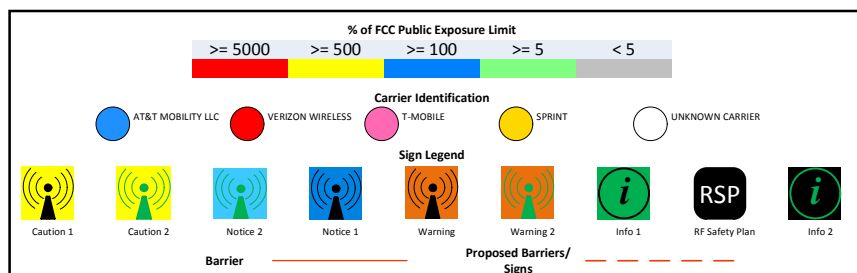
) Ground = 0'

The Antenna Inventory heights are referenced to the same level.

# RF Exposure Simulation For: SOMERS

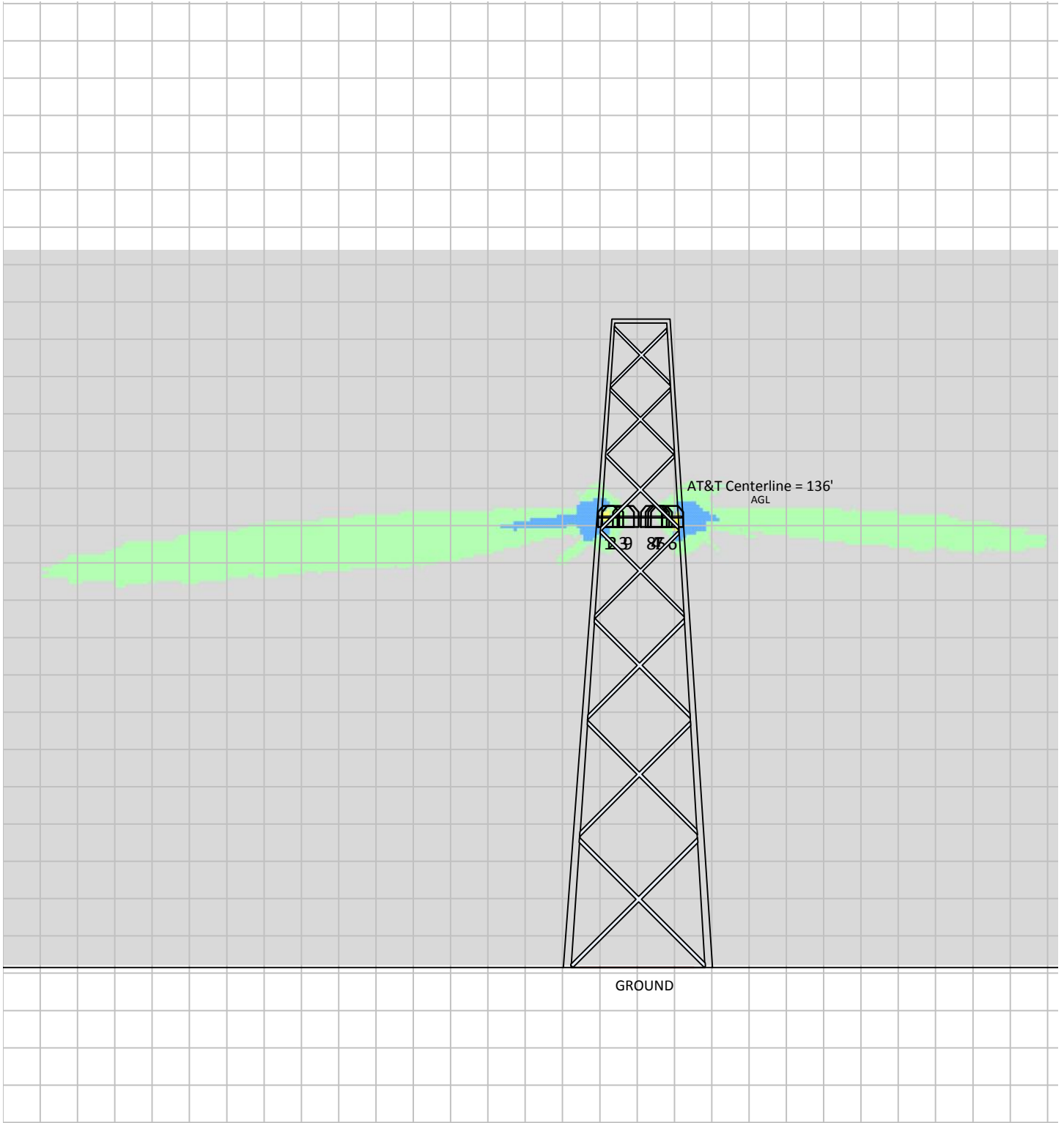


% of FCC Public Exposure Limit  
Spatial average 0' - 6'

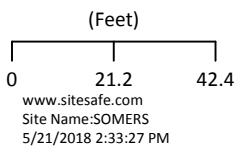


Sitesafe OET-65 Model  
Near Field Boundary:  
1.5 \* Aperture  
Reflection Factor: 1  
Spatially Averaged

# RF Exposure Simulation For: SOMERS Elevation View



% of FCC Public Exposure Limit



% of FCC Public Exposure Limit				
>= 5000	>= 500	>= 100	>= 5	< 5
Carrier Identification				
● AT&T MOBILITY LLC	● VERIZON WIRELESS	● T-MOBILE	● SPRINT	● UNKNOWN CARRIER
Sign Legend				
Caution 1	Caution 2	Notice 2	Notice 1	Warning
Warning 2	Info 1	RSP	Info 2	
Proposed Barriers/ Signs				
Barrier	Proposed Barriers/ Signs			Signs

Sitesafe OET-65 Model  
Near Field Boundary:  
1.5 \* Aperture  
Reflection Factor: 1  
Single Level (0)

## 5 Site Compliance

### 5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

### 5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

#### Site Access Location

(1) Yellow Caution 2 sign is required to be installed on the access peg.

#### Notes:

- ) This report's diagrams do not show the Access locations because the data provided did not include them.
- ) Data concerning all other carriers on site was unavailable and therefore not included in this report.
- ) Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.

## 6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, LLC., in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Zyotty Thamsil.

May 21, 2018



## Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.



## Appendix B – Regulatory Background Information

### FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

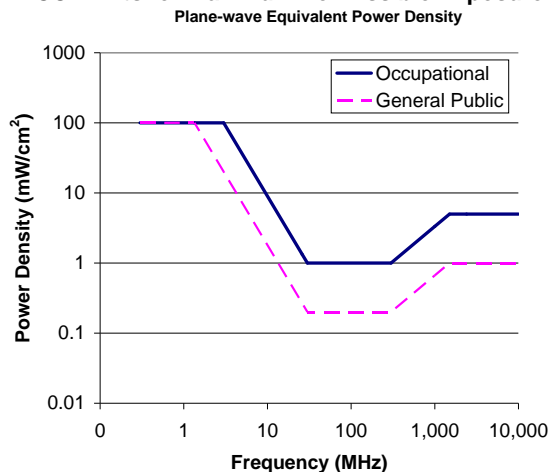
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

#### FCC Limits for Maximum Permissible Exposure (MPE)



### Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

### Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

\*Plane-wave equivalent power density

### OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

- (a) Each employer –
  - (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
  - (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

## Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

**General Maintenance Work:** Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

**Training and Qualification Verification:** All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

**Physical Access Control:** Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- ) Locked door or gate
- ) Alarmed door
- ) Locked ladder access
- ) Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

**RF Signage:** Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

**Assume all antennas are active:** Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

**Maintain a 3 foot clearance from all antennas:** There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

**Site RF Emissions Diagram:** Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

## Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- J Areas indicated as Gray are predicted to be below 5% of the MPE limits. Gray represents areas more than 20 times below the most conservative exposure limit.
- J Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- J Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers.**
- J Yellow represents areas predicted to exceed Occupational MPE limits. Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.
- J Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

## Appendix E – Assumptions and Definitions

### General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

### Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

## Definitions

**5% Rule** – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

**Compliance** – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

**Decibel (dB)** – A unit for measuring power or strength of a signal.

**Duty Cycle** – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

**Effective (or Equivalent) Isotropic Radiated Power (EIRP)** – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

**Effective Radiated Power (ERP)** – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

**Gain (of an antenna)** – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

**General Population/Uncontrolled Environment** – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

**Generic Antenna** – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

**Isotropic Antenna** – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

**Maximum Measurement** – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

**Maximum Permissible Exposure (MPE)** – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

**Occupational/Controlled Environment** – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

**OET Bulletin 65** – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

**OSHA (Occupational Safety and Health Administration)** – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit [www.osha.gov](http://www.osha.gov).

**Radio Frequency (RF)** – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

**Radio Frequency Exposure (RFE)** – The amount of RF power density that a person is or might be exposed to.

**Spatial Average Measurement** – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

**Transmitter Power Output (TPO)** – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

## Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, LLC.

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

[http://www.cancer.org/docroot/PED/content/PED\\_1\\_3X\\_Cellular\\_Phone\\_Towers.asp?sitearea=PED](http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED)

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

[http://ec.europa.eu/health/ph\\_risk/committees/04\\_scenihp/docs/scenihp\\_o\\_022.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf)

Fairfax County, Virginia Public School Survey

<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-ionising Radiation

[http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb\\_C/1317133826368](http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368)

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>



# 126 PIONEER HEIGHTS

**Location** 126 PIONEER HEIGHTS

**Mblu** 01/ 13/ A/ /

**Acct#** 00228200

**Owner** FARNHAM LENA G & FAYE F GATELY

**Assessment** \$134,200

**Appraisal** \$191,600

**PID** 1814

**Building Count** 1

**Dev Lot**

**Dev Map**

**Exempt Code**

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$111,600	\$80,000	\$191,600

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$78,200	\$56,000	\$134,200

## Owner of Record

**Owner** FARNHAM LENA G & FAYE F GATELY  
**Co-Owner** C/O CROWN ATLANTIC CO LLC  
**Address** PMB 353 4017 WASHINGTON R  
MCMURRAY, PA 15317

**Sale Price** \$0  
**Certificate**  
**Book & Page** 280/ 125  
**Sale Date** 08/21/2008

## Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
FARNHAM LENA G & FAYE F GATELY	\$0		280/ 125	08/21/2008
FARNHAM CLARENCE D JR ET AL	\$0		255/ 671	11/28/2005

## Building Information

### Building 1 : Section 1

**Year Built:**  
**Living Area:** 0  
**Replacement Cost:** \$0


**Building Percent****Good:****Replacement Cost****Less Depreciation:** \$0

Building Attributes	
Field	Description
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy:	
Exterior Wall 1:	
Exterior Wall 2:	
Roof Structure:	
Roof Cover:	
Interior Wall 1:	
Interior Wall 2:	
Interior Flr 1:	
Interior Flr 2	
Heat Fuel:	
Heat Type:	
AC Type:	
Total Bedrooms	
Total Full Baths	
Total Half Baths	
Total Xtra Fixtrs:	
Total Rooms	
Bath Style:	
Kitchen Style:	
Fireplace, Plain	
Basement garage	
Extra Kitchens	
Fin Bsmt Area	
Fin Bsmt Quality	
Whirlpool Tub	
Foundation	

**Building Photo**

(<http://images.vgsi.com/photos/SomersCTPhotos//\00\00\76\46>)

**Building Layout**

 Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

**Extra Features**

Extra Features	Legend
No Data for Extra Features	

## Land

### Land Use

**Use Code** 299  
**Description** Vac Comm Lnd  
**Zone** A-1  
**Neighborhood** C  
**Alt Land Appr Category** No

### Land Line Valuation

**Size (Acres)** 0,5  
**Frontage**  
**Depth**  
**Assessed Value** \$56,000  
**Appraised Value** \$80,000

## Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN1	Fence, Chain	8	8 ft	400 LF	\$5,500	1
CB1	PreCast Cell Shed	CB		315 SF	\$47,300	1
CB1	PreCast Cell Shed	CB		192 SF	\$28,800	1
TWR	Tower			160 LF	\$0	1
CB1	PreCast Cell Shed	CB		200 SF	\$30,000	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$111,900	\$85,000	\$196,900
2013	\$111,900	\$85,000	\$196,900
2012	\$111,900	\$85,000	\$196,900

Assessment			
Valuation Year	Improvements	Land	Total
2014	\$78,400	\$59,500	\$137,900
2013	\$78,400	\$59,500	\$137,900
2012	\$78,400	\$59,500	\$137,900

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Date: **November 1, 2017**

Marianne Dunst  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277  
704.405.6580

Paul J. Ford and Company  
250 East Broad St., Suite 600  
Columbus, OH 43215  
RDorris@pjfweb.com  
614.221.6679

**Subject: Structural Analysis Report**

**Carrier Designation:** **AT&T Mobility Co-Locate**  
**Carrier Site Number:** CTL01079  
**Carrier Site Name:** SOMERS - PIONEER HEIGHTS RD

**Crown Castle Designation:** **Crown Castle BU Number:** 806378  
**Crown Castle Site Name:** HRT 086 943248  
**Crown Castle JDE Job Number:** 461865  
**Crown Castle Work Order Number:** 1466020  
**Crown Castle Application Number:** 407740 Rev. 1

**Engineering Firm Designation:** **Paul J. Ford and Company Project Number:** 37517-3412.001.8700

**Site Data:** **126 PIONEER HEIGHTS RD, SOMERS, Tolland County, CT**  
**Latitude 41° 56' 55.98", Longitude -72° 29' 31.55"**  
**160 Foot - Self Support Tower**

Dear Marianne Dunst,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1087121, in accordance with application 407740, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment

**Insufficient Capacity**

Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 122 mph converted to a nominal 3-second gust wind speed of 95 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Rebekah M. Dorris, EI  
Structural Designer

Date: **November 1, 2017**

Marianne Dunst  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277  
704.405.6580

Paul J. Ford and Company  
250 East Broad St., Suite 600  
Columbus, OH 43215  
RDorris@pjfweb.com  
614.221.6679

**Subject: Structural Analysis Report**

**Carrier Designation:** **AT&T Mobility Co-Locate**  
**Carrier Site Number:** CTL01079  
**Carrier Site Name:** SOMERS - PIONEER HEIGHTS RD

**Crown Castle Designation:** **Crown Castle BU Number:** 806378  
**Crown Castle Site Name:** HRT 086 943248  
**Crown Castle JDE Job Number:** 461865  
**Crown Castle Work Order Number:** 1466020  
**Crown Castle Application Number:** 407740 Rev. 1

**Engineering Firm Designation:** **Paul J. Ford and Company Project Number:** 37517-3412.001.8700

**Site Data:** **126 PIONEER HEIGHTS RD, SOMERS, Tolland County, CT**  
**Latitude 41° 56' 55.98", Longitude -72° 29' 31.55"**  
**160 Foot - Self Support Tower**

Dear Marianne Dunst,

*Paul J. Ford and Company* is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1087121, in accordance with application 407740, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

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Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 122 mph converted to a nominal 3-second gust wind speed of 95 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at *Paul J. Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

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Structural Designer

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## 1) INTRODUCTION

This tower is a 160-ft Self Support tower designed by ROHN in December of 1986. The tower was originally designed for EIA Zone "A" w/ 1/2" radial ice.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 94.5 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
135.0	137.0	3	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	2 1	3/4 3/8	-
		3	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe			
		6	powerwave technologies	7020.00			
		1	raycap	DC6-48-60-18-8F			
		3	ericsson	RRUS 32 B2			
		3	kaelus	DBC0062F1V51-1			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B66			

**Table 2 - Existing Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
157.0	157.0	2	antel	LPA-80063/4CF w/ Mount Pipe	20	1-5/8	1
		2	rfs celwave	APL866513-42T6 w/ Mount Pipe			
		2	antel	LPA-80063/4CFx5 w/ Mount Pipe			
		3	andrew	LNx-6514DS-VTM w/ Mount Pipe			
		6	commscope	HBXX-6517DS-VTM w/ Mount Pipe			
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-AWS			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Sector Mount [SM 504-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
135.0	137.0	2	andrew	SBNH-1D6565C w/ Mount Pipe	-	-	2	
		4	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe				
		3	ericsson	RRUS 12				
		3	ericsson	RRUS A2				
		3	communication components inc.	DTMABP7819VG12A				
	135.0	135.0	3	powerwave technologies	7770.00 w/ Mount Pipe	12 2 1	1-1/4 3/4 3/8	1
			3	powerwave technologies	TT19-08BP111-001			
			1	raycap	DC6-48-60-18-8F			
			3	ericsson	RRUS 11			
125.0	126.0	1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	1 3	5/8 1-1/4	1	
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe				
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe				
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER				
		3	alcatel lucent	TD-RRH8x20-25				
		3	alcatel lucent	1900MHz RRH (65MHz)				
	125.0	1	tower mounts	Sector Mount [SM 402-3]				
113.0	114.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	3 1 6	7/8 1-3/16 1-5/8	1	
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe				
	113.0	1	tower mounts	Pipe Mount [PM 601-3]				
		1	tower mounts	Side Arm Mount [SO 702-3]				
57.0	60.0	1	gps	GPS_A	1	1/2	1	
	57.0	1	tower mounts	Side Arm Mount [SO 202-1]				
48.0	50.0	1	empty	EMPTY_MOUNT w/ Mount Pipe	1	1/2	1	
	48.0	1	tower mounts	Side Arm Mount [SO 202-1]				

- Notes:  
 1) Existing Equipment  
 2) Equipment To Be Removed



### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
Geotechnical Reports	FDH, 11/6/2006	1275233	CCISITES
Tower Structural Analysis Reports (With Manufacturer Drawings)	VSI, 2/1/2005 - Rohn, 12/16/1986	1918334	CCISITES
Tower Structural Analysis Reports (With Foundation Drawings)	Rohn, 4/19/1984	1918334	CCISITES
Tower Reinforcement Design (Includes PMI)	VSI, 11/8/2006	1278690	CCISITES
Tower Reinforcement Design	VSI, 2/17/2011	2961397	CCISITES
Post-Modification Inspection	VSI, 9/16/2011	2961404	CCISITES
Tower Reinforcement Design	VSI, 6/15/2012	3265393	CCISITES
Post-Modification Inspection	TEP, 2/19/2013	3684249	CCISITES
Tower Reinforcement Design	VSI, 2/26/2015	5615504	CCISITES
Post-Modification Inspection	TEP, 8/20/2015	5852475	CCISITES

#### 3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically, and must be replaced if damaged or cracked. Refer to crown document PRC-10012, Base Plate Grout Inspection & Classification.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	160 - 140	Leg	Pipe 2.375" x 0.154" (2 STD)	1	-18.65	36.84	50.6	Pass
T2	140 - 135	Leg	Pipe 2.875" x 0.276" (2.5 EH)	37	-23.32	74.43	31.3	Pass
T3	135 - 130	Leg	Pipe 2.875" x 0.276" (2.5 EH)	51	-33.60	74.43	45.1	Pass
T4	130 - 125	Leg	Pipe 2.875" x 0.276" (2.5 EH)	60	-42.30	74.43	56.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	125 - 120	Leg	Pipe 2.875" x 0.276" (2.5 EH)	69	-52.48	74.43	70.5	Pass
T6	120 - 113.333	Leg	Pipe 3.5" x 0.300" (3 EH)	78	-63.93	94.34	67.8	Pass
T7	113.333 - 106.667	Leg	Pipe 3.5" x 0.300" (3 EH)	87	-77.17	94.35	81.8	Pass
T8	106.667 - 100	Leg	Pipe 3.5" x 0.300" (3 EH)	96	-90.38	123.17	73.4	Pass
T9	100 - 93.333	Leg	Pipe 4" x 0.318" (3.5 EH)	108	-103.36	125.72	82.2	Pass
T10	93.333 - 86.667	Leg	Pipe 4" x 0.318" (3.5 EH)	117	-116.10	125.73	92.3	Pass
T11	86.667 - 80	Leg	Pipe 4" x 0.318" (3.5 EH)	126	-128.57	153.94	83.5	Pass
T12	80 - 73.333	Leg	Pipe 4.5" x 0.337" (4 XS)	138	-141.53	159.90	88.5	Pass
T13	73.333 - 66.667	Leg	Pipe 4.5" x 0.337" (4 XS)	147	-153.52	187.42	81.9	Pass
T14	66.667 - 60	Leg	Pipe 4.5" x 0.337" (4 XS)	159	-166.14	187.44	88.6	Pass
T15	60 - 50	Leg	Pipe 5.563" x 0.375" (5 EH)	171	-182.09	201.25	90.5	Pass
T16	50 - 40	Leg	Pipe 5.563" x 0.375" (5 EH)	180	-200.57	253.14	79.2 82.5 (b)	Pass
T17	40 - 30	Leg	Pipe 5.563" x 0.375" (5 XS)	192	-219.21	253.16	86.6	Pass
T18	30 - 20	Leg	Pipe 5.563" x 0.375" (5 XS)	204	-237.28	269.72	88.0	Pass
T19	20 - 0	Leg	BU 806378 (PJF) - 6.625"x0.34" pipe w/ 2" SR	246	-274.43	250.77	109.4	Fail
T1	160 - 140	Diagonal	L 1.75 x 1.75 x 3/16	11	-2.89	8.66	33.4 49.6 (b)	Pass
T2	140 - 135	Diagonal	L 1.75 x 1.75 x 3/16	48	-2.97	6.73	44.2 48.4 (b)	Pass
T3	135 - 130	Diagonal	L 1.75 x 1.75 x 3/16	57	-4.46	6.10	73.2 77.8 (b)	Pass
T4	130 - 125	Diagonal	L 1.75 x 1.75 x 3/16	66	-4.55	5.54	82.1	Pass
T5	125 - 120	Diagonal	L 2 x 2 x 3/16	75	-5.45	7.65	71.2 86.7 (b)	Pass
T6	120 - 113.333	Diagonal	L 2.5 x 2.5 x 1/4	84	-6.05	14.86	40.7 79.3 (b)	Pass
T7	113.333 - 106.667	Diagonal	L 2.5 x 2.5 x 1/4	93	-6.61	13.49	49.0 87.0 (b)	Pass
T8	106.667 - 100	Diagonal	L 2.5 x 2.5 x 1/4	102	-6.93	11.85	58.4 89.4 (b)	Pass
T9	100 - 93.333	Diagonal	L 2.5 x 2.5 x 3/16	114	-6.91	9.80	70.5	Pass
T10	93.333 - 86.667	Diagonal	L 2.5 x 2.5 x 1/4	123	-7.35	11.85	62.0	Pass
T11	86.667 - 80	Diagonal	2L 2.5 x 2.5 x 3/16 (1/4)	132	-7.70	29.83	25.8 28.5 (b)	Pass
T12	80 - 73.333	Diagonal	L 3 x 3 x 3/16	144	-7.65	12.92	59.2	Pass
T13	73.333 - 66.667	Diagonal	L 3 x 3 x 3/16	153	-8.29	10.49	79.1	Pass
T14	66.667 - 60	Diagonal	L 3 x 3 x 3/16	165	-8.33	9.67	86.1	Pass
T15	60 - 50	Diagonal	2L 3 x 3 x 3/16 (1/4)	177	-9.93	32.02	31.0 65.2 (b)	Pass
T16	50 - 40	Diagonal	2L 3 x 3 x 3/16 (1/4)	186	-10.54	29.17	36.1 68.2 (b)	Pass
T17	40 - 30	Diagonal	2L 3 x 3 x 1/4 (1/4)	198	-10.81	35.43	30.5 68.8 (b)	Pass
T18	30 - 20	Diagonal	2L 3 x 3 x 1/4 (1/4)	223	-11.42	57.63	19.8 71.7 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T19	20 - 0	Diagonal	2L 3.5 x 3.5 x 1/4 (1/4)	252	-11.80	45.74	25.8 76.4 (b)	Pass
T18	30 - 20	Horizontal	L 3 x 3 x 3/16	219	-4.12	7.83	52.6	Pass
T8	106.667 - 100	Secondary Horizontal	L 1.75 x 1.75 x 1/4	104	-1.57	5.95	26.3	Pass
T11	86.667 - 80	Secondary Horizontal	L 2 x 2 x 3/16	134	-2.23	4.84	46.1	Pass
T13	73.333 - 66.667	Secondary Horizontal	L 1.75 x 1.75 x 1/4	155	-2.66	3.34	79.8	Pass
T14	66.667 - 60	Secondary Horizontal	L 2 x 2 x 3/16	167	-2.88	3.53	81.5	Pass
T16	50 - 40	Secondary Horizontal	L 2.5 x 2.5 x 3/16	188	-3.48	5.56	62.5	Pass
T17	40 - 30	Secondary Horizontal	L 3 x 3 x 1/4	200	-3.80	11.20	33.9	Pass
T1	160 - 140	Top Girt	L 2 x 2 x 1/8	5	-0.55	3.21	17.2	Pass
T2	140 - 135	Top Girt	L 2 x 2 x 1/8	40	-0.43	3.17	13.5	Pass
T18	30 - 20	Redund Horz 1 Bracing	L 2 x 2 x 3/16	217	-4.12	9.19	44.8	Pass
T18	30 - 20	Redund Diag 1 Bracing	L 2 x 2 x 3/16	240	-2.40	6.77	35.4	Pass
							Summary	
						Leg (T19)	109.4	Fail
						Diagonal (T8)	89.4	Pass
						Horizontal (T18)	52.6	Pass
						Secondary Horizontal (T14)	81.5	Pass
						Top Girt (T1)	17.2	Pass
						Redund Horz 1 Bracing (T18)	44.8	Pass
						Redund Diag 1 Bracing (T18)	35.4	Pass
						Bolt Checks	89.4	Pass
						Rating =	109.4	Fail

**Table 5 - Tower Component Stresses vs. Capacity – LC5**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	85.0	Pass
1	Base Foundation Structural	-	38.2	Pass
1	Base Foundation Soil Interaction	-	74.4	Pass
<b>Structure Rating (max from all components) =</b>				<b>109.4%</b>

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.

**4.1) Recommendations**

The tower does not have sufficient capacity to carry the proposed loading configuration. Modifications will be required to bring the tower into compliance with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda for the proposed loading configuration. The following components require modifications:

- Tower legs from 0-ft to 20-ft

Further engineering and detailing is required to design the necessary modifications.