

March 15th, 2018

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

Re: Notice of Exempt Modification – Triplexer Swap

Property Address: 203 Research Drive, Milford, CT 06460

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 167-feet on an existing 185-foot monopole, owned by American Tower at 10 Presidential Way, Woburn MA 01801. AT&T now intends to swap two (2) existing LGP21901 Diplexers for two (2) CCI TPX-070821 Triplexers and install in position [2] all sectors, for a total of six (6) diplexers being swapped. All of the changes will take place on the existing antenna mount.

Per the attached Zoning Permit, the construction of the aforementioned monopole was approved by the city of Milford, CT on October 20th, 1994. Please see attached 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. § 16-5l0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Stephen H. Harris - Zoning Enforcement Officer, City of Milford, CT, 70 West River St. Milford, CT 06460 and Benjamin G. Blake - Mayor, City of Milford, CT, 70 West River St. Milford, CT 06460. A copy of this letter is being sent to the property owner, Damato Investments LLC, 183 Quarry Rd. Milford, CT 06460. A copy of this letter is also being sent to the tower company, American Tower, ATTN: Zoning Department, 10 Presidential Way, Woburn MA 01801.

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

- EM-CING-084-148-014-060623 New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 185 Research Drive, Milford; 100 Northrop Road, Wallingford; 90 North Plains Industrial Road, Wallingford; and 4 Beaver Road, Branford, Connecticut.
- EM-CING-084-080917 New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 185 Research Drive, Milford, Connecticut.
- **EM-CING-084-110314** New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 203 Research Drive, **Milford**, Connecticut.
- EM-AT&T-084-160222 AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 185/203 Research Drive, Milford, Connecticut.
- EM-AT&T-084-160222 AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 185/203 Research Drive, Milford, Connecticut.
- EM-AT&T-084-170123b AT&T notice of intent to modify an existing telecommunications facility located at 181-1 Research Drive, Milford, 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 167-foot level of the 185-foot monopole.
- 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.
- 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

Kuchmair

DATE FILED /0/25/74
RECEIPT NO. /04536 FEE #22 CO Includes CZC



City of Milford, Connecticut

APPLICATION FOR ZONING PERMIT

Fill out this application in ball point pen. A scaled plot plan in duplicate, INSTRUCTIONS: based on a certified surveyor's plot plan must be submitted with this application showing the proposed or existing lot and building dimensions and the location of all buildings in relation to the street lines, side lot lines and rear lot lines.

ADDRESS OF PROPERTY 185 Research Dri	ve zone G. I.
MAPBLOCKPARCELLOT N	0.607 ADDRESS MAP NOLOT SIZE
WIDTH OF STREET RIGHT OF WAY LESS THAN 50 FT	
IS ANY PORTION OF THE LOT BELOW REGULATORY F	LOOD ELEVATION? YES NO
CITY WATER NA PRIVATE WELL* SEWER** N	A SEPTIC*** ENG. O.S. PERMIT NO. WA
OWNER John C. D' Amato Ji. Trustee le	ased to Smart SMR of New York Inc
ADDRESS OF OWNER 147 Research Dr. 1711. Street	1 ford. 575 Coperate Dr. Suite 462 City Maliwah. NJ, State 07430
PROPOSED CONSTRUCTION: NEW X ADDITION	
	bile radio transmission cellular tower facility
extend more than 14 additional	height
NO. OF STORIES HEIGHT REQUIRED PAR	
DATE OF: ZBA APPROVAL Oct 12,93 CASPR	APPROVAL EXEMPTION ISSUED
SITE PLAN APPROVAL SPECIAL PER	RMIT APPROVAL SUBD. REQUIRED YES NO
and with full authority of the Zoning Regulations per	that I am making this application on behalf of the owner of the property and that I am aware of tinent in this case and that the statements made . APPROVAL SHALL BE VALID FOR PLANS AS SUBMITTED.
THE OCCUPANCY AND USE OF LAND AND ISSUANCE OF A CERTIFICATE OF OCCU	BUILDINGS OR STRUCTURES PRIOR TO THE PANCY IS PROHIBITED.
APPROVED BY:	APPLICANTS'S NAME PETER FILMION (Please print)
$a \wedge a \wedge$	APPLICANT'S SIGNATURE
Zoning Enforcement Officer	ADDRESS ONE N BRIMWAY DOOFT.
Date Issued /0/26/94	CITY NO PONS Street STATE N.
, ,	TEL. NO. 414-448-43/6
*Permit required from State Health Dept. shopping centers and public buildings. ** Permits for sewer connections are grante *** Septic system approvals are granted by R	for apartments, subdivisions, trailer parks, led by Sewer Commission. NOV - 7 1004
5/93	BUILDING DEPARTMENT MILECRO, CONN.





Smartlink on behalf of AT&T Mobility, LLC Site FA – 10035075 Site ID – CT2169 (MRCTB019875-MRCTB019736) USID – 61189 Site Name – New haven -Woodmont Site Compliance Report

203 Research Dr Milford, CT 6460

Latitude: N41-14-25.47 Longitude: W73-0-42.99 Structure Type: Monopole

Report generated date: March 8, 2018

Report by: Scott Broyles

Customer Contact: Romina Kirchmaier

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?	Yes
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max simulated RFE level on the	<1% General Public Limit
Ground	
FCC & AT&T Compliant?	Will Be Compliant

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTU2169_2017-LTE-Next-Carrier_LTE_mm093q_PTN_10035075_61189_09-22-2016_Preliminary-Approved_v1.00

CD's: 10035075_AE201_170203_CTL02169_Rev1_4C-5C CD_\$&\$

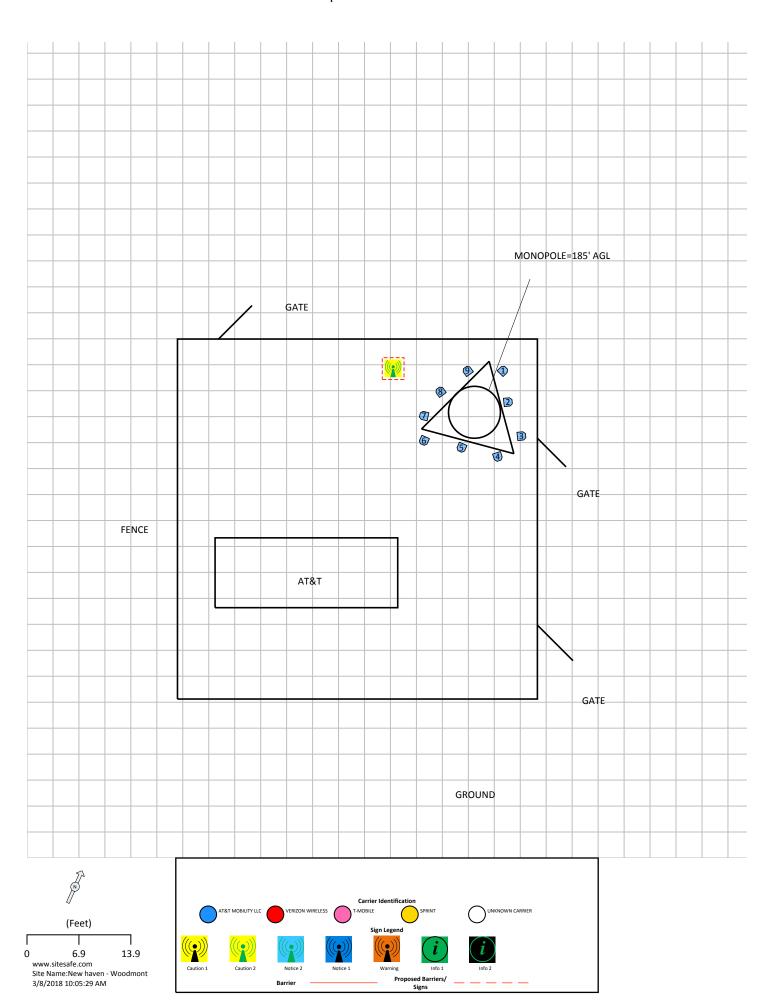
RF Powers Used: RFDS Above



2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Detailed View Side View





3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Туре	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	х	Υ	Z
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	21	82	4.6	11.51	0	2	0	335	116.1'	146.8'	164.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	21	86	4.6	13.41	0	2	0	955.1	116.1'	146.8'	164.7'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	60	60	4	11.36	0	0	1	1000	116.8'	142.2'	165'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	60	61.1	4	14.26	0	0	1	1044.7	116.8'	142.2'	165'
2	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	737	60	65.8	4	10.76	0	0	1	1475.7	116.8'	142.2'	165'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	737	60	69	6	11.46	0	0	1	574.1	118.8'	137.3'	164'
3	AT&T MOBILITY LLC	Quintel Q\$66512-2	Panel	1900	60	68	6	14.16	0	0	1	1655.8	118.8'	137.3'	164'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	138	82	4.6	11.51	0	2	0	530.9	115.3'	134.3'	164.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	138	86	4.6	13.41	0	2	0	955.1	115.3'	134.3'	164.7'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	180	60	4	11.36	0	0	1	1000	110.1'	135.6'	165'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	180	61.1	4	14.26	0	0	1	1044.7	110.1'	135.6'	165'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	737	180	65.8	4	10.76	0	0	1	1475.7	110.1'	135.6'	165'
6	AT&T MOBILITY LLC	Quintel Q\$66512-2	Panel	737	180	69	6	11.46	0	0	1	574.1	104.7'	136.6'	164'
6	AT&T MOBILITY LLC	Quintel Q\$66512-2	Panel	1900	180	68	6	14.16	0	0	1	1655.8	104.7'	136.6'	164'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	259	82	4.6	11.51	0	2	0	530.9	104.7'	140.2'	164.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	259	86	4.6	13.41	0	2	0	955.1	104.7'	140.2'	164.7'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	850	300	60	4	11.36	0	0	1	1000	107.1'	143.7'	165'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	2300	300	61.1	4	14.26	0	0	1	1044.7	107.1'	143.7'	165'
8	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H4	Panel	737	300	65.8	4	10.76	0	0	1	1475.7	107.1'	143.7'	165'
9	AT&T MOBILITY LLC	Quintel Q\$66512-2	Panel	737	300	69	6	11.46	0	0	1	574.1	111'	146.7'	164'
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	300	68	6	14.16	0	0	1	1655.8	111'	146.7'	164'

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. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

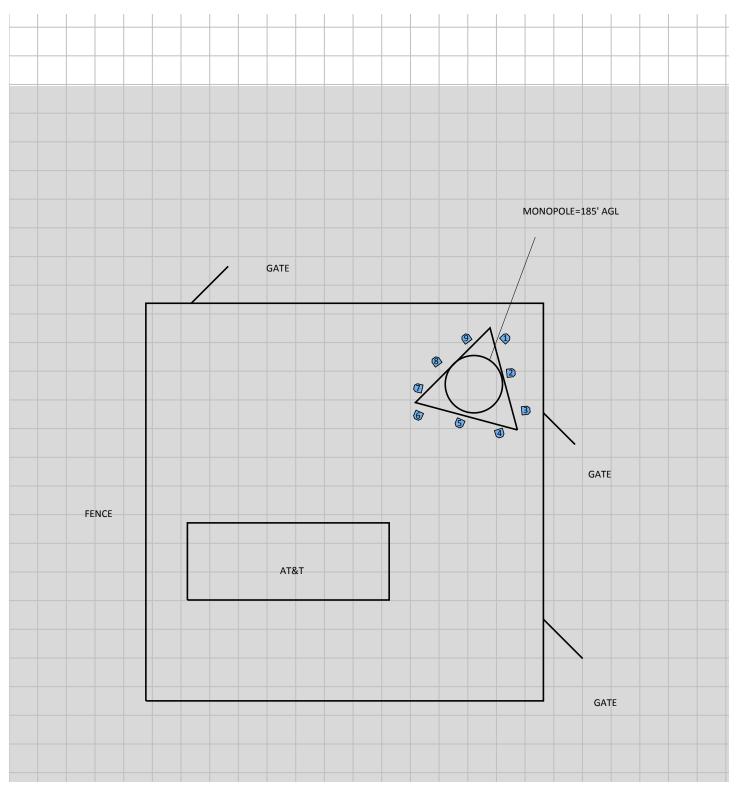
Note: The 850 and 737 MHz LTE technology is being added to existing antennas.



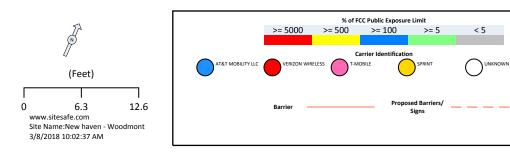
4 Emission Predictions

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 Antenna Inventory heights are referenced to the same level.

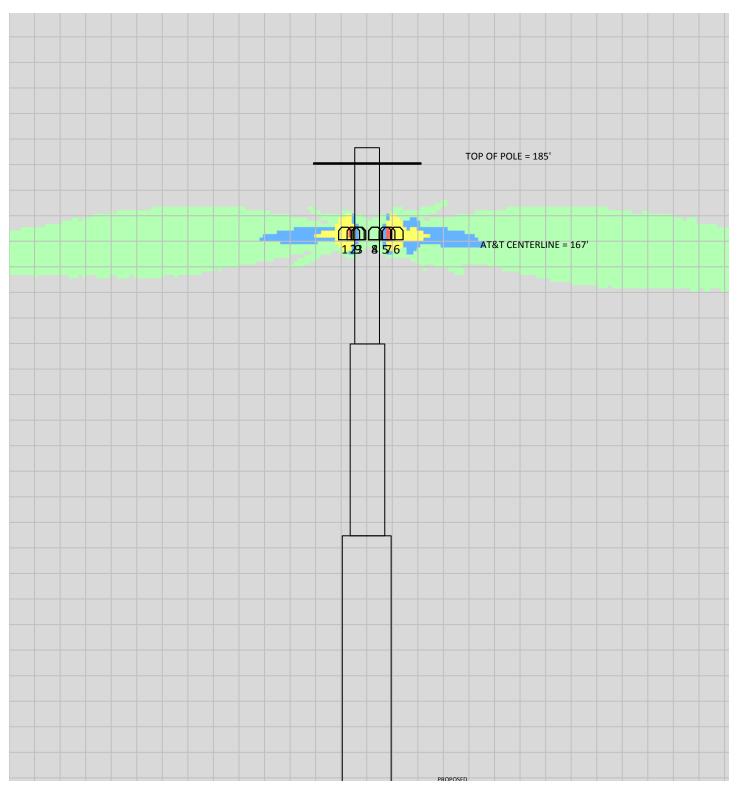


% of FCC Public Exposure Limit Spatial average 0' - 6'



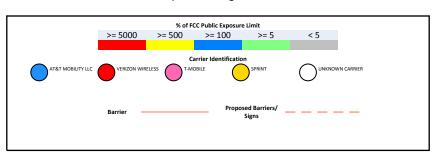
SitesafeTC Version:1.0.0.0 - 0.0.0.268 Sitesafe OET-65 Model Near Field Boundary: 1.5 * Aperture Reflection Factor: 1 Single Level (0)

RF Exposure Simulation For: New haven – Woodmont Side View



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





SitesafeTC Version:1.0.0.0 - 0.0.0.268 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, and the level of restricted access to the antennas at the site.

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

Yellow caution 2 sign required at tower climbing point.

Notes:

- Data concerning all other carriers on site was unavailable and therefore not included in this report.
- Sitesafe recommends that all AT&T Mobility, LLC signage be removed from all access points, as they are not required by AT&T Mobility, LLC's signage policy.
- 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, Inc., in Arlington, 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 Scott Broyles.

March 8, 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.

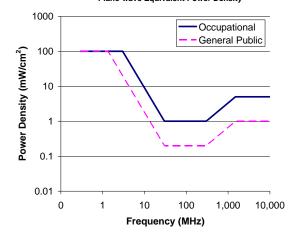
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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:







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/cm²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-			5	6
100,000				

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/cm²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-			1.0	30
100,000				

f = frequency in MHz

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 -
 - 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.

^{*}Plane-wave equivalent power density



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.

<u>General Maintenance Work</u>: 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.

<u>Iraining and Qualification Verification:</u> 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).

<u>Physical Access Control:</u> 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)

<u>RF Signage:</u> 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.

<u>Site RF Emissions Diagram:</u> 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:

- 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.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. Green areas are accessible to anyone.
- 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.
- 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.
- 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.

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, Inc.

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

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

http://ec.europa.eu/health/ph risk/committees/04 scenihr/docs/scenihr 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

Norwegian Institute of Public Health

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

StartAnte	<mark>n</mark> naData	It is advisa	ble to prov	ide an ID	(ant 1) for	all antennas												
		(MHz)	Trans	Trans	Coax	Coax	Other	Input	Calc			(ft)	(ft)	(ft)	(ft) d	Bd BWdth	Uptime	ON
ID	Name	Freq	Power	Count	Len	Type	Losses	Power	Power	Mfg	Model	Χ	Υ	Z Type	Aper 0	ain Pt Dir	Profile	flag
1	AT&T MO	B 850	11.8301	1	2	0		23.6602	3	Powerwa	v: 7770	116.	1 146.76	164.7085 Panel	4.583	11.51 82;21	100%	ON•
1	AT&T MO	B 1900	21.7771	3	2	0		43.5542	6	Powerwa	v: 7770	116.	1 146.76	164.7085 Panel	4.583	13.41 86;21	100%	ON•
2	AT&T MO	B 850	73.1139	1	1	0		73.1139	1	CCI Anter	nn OPA-65R-L	116.8	1 142.23	165 Panel	4	11.36 60;60	100%	ON•
2	AT&T MO	B 2300	39.1741	3	1	0		39.1741	8	CCI Anter	nn OPA-65R-L	116.8	1 142.23	165 Panel	4	14.26 61.1;60	100%	ON•
2	AT&T MO	B 737	123.879	7	1	0		123.879	7	CCI Anter	nn OPA-65R-L	116.8	1 142.23	165 Panel	4	10.76 65.8;60	100%	ON•
3	AT&T MO	B 737	41.0203	3	1	0		41.0203	8	Quintel	QS66512-2	118.7	6 137.32	164 Panel	6	11.46 69;60	100%	ON•
3	AT&T MO	B 1900	63.5330	9	1	0		63.5330	9	Quintel	QS66512-2	118.7	6 137.32	164 Panel	6	14.16 68;60	100%	ON•
4	AT&T MO	B 850	18.7499	1	2	0		37.4998	1	Powerwa	v: 7770	115.3	3 134.33	164.7085 Panel	4.583	11.51 82;138	100%	ON•
4	AT&T MO	B 1900	21.7771	3	2	0		43.5542	6	Powerwa	v: 7770	115.3	3 134.33	164.7085 Panel	4.583	13.41 86;138	100%	ON•
5	AT&T MO	B 850	73.1139	1	1	0		73.1139	1	CCI Anter	nn OPA-65R-L	110.	1 135.64	165 Panel	4	11.36 60;180	100%	ON•
5	AT&T MO	B 2300	39.1741	3	1	0		39.1741	8	CCI Anter	nn OPA-65R-L	110.	1 135.64	165 Panel	4	14.26 61.1;180	100%	ON•
5	AT&T MO	B 737	123.879	7	1	0		123.879	7	CCI Anter	nn OPA-65R-L	110.	1 135.64	165 Panel	4	10.76 65.8;180	100%	ON•
6	AT&T MO	B 737	41.0203	3	1	0		41.0203	8	Quintel	QS66512-2	104.6	7 136.64	164 Panel	6	11.46 69;180	100%	ON•
6	AT&T MO	B 1900	63.5330	9	1	0		63.5330	9	Quintel	QS66512-2	104.6	7 136.64	164 Panel	6	14.16 68;180	100%	ON•
7	AT&T MO	B 850	18.7499	1	2	0		37.4998	1	Powerwa	v: 7770	104.6	7 140.24	164.7085 Panel	4.583	11.51 82;259	100%	ON•
7	AT&T MO	B 1900	21.7771	3	2	0		43.5542	6	Powerwa	v: 7770	104.6	7 140.24	164.7085 Panel	4.583	13.41 86;259	100%	ON•
8	AT&T MO	B 850	73.1139	1	1	0		73.1139	1	CCI Anter	nn OPA-65R-L	107.0	5 143.73	165 Panel	4	11.36 60;300	100%	ON•
8	AT&T MO	B 2300	39.1741	3	1	0		39.1741	8	CCI Anter	nn OPA-65R-L	107.0	5 143.73	165 Panel	4	14.26 61.1;300	100%	ON•
8	AT&T MO	B 737	123.879	7	1	0		123.879	7	CCI Anter	nn OPA-65R-L	107.0	5 143.73	165 Panel	4	10.76 65.8;300	100%	ON•
9	AT&T MO	B 737	41.0203	3	1	0		41.0203	8	Quintel	QS66512-2	110.9	7 146.73	164 Panel	6	11.46 69;300	100%	ON•
9	AT&T MO	B 1900	63.5330	9	1	0		63.5330	9	Quintel	QS66512-2	110.9	7 146.73	164 Panel	6	14.16 68;300	100%	ON•

StartSymbol Data



Structural Analysis Report

Structure : 183 ft Monopole

ATC Site Name : Milford CT 2, CT

ATC Site Number : 302535

Engineering Number : OAA722086_C3_02

Proposed Carrier : AT&T Mobility

Carrier Site Name : New Haven - Woodmont

Carrier Site Number : CTL02169 / FA# 10035075

Site Location : 185 Research Drive

Milford, CT 06460-7733

41.240400,-73.011900

County : New Haven

Date : March 7, 2018

Max Usage : 100%

Result : Pass

Prepared By: Reviewed By:

Robert D. Barrett, E.I. Structural Engineer II

Robert D. Barrett

COA: PEC.0001553



Table of Contents

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 183 ft monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	Summit Manufacturing Drawing #1237-D1, dated September 9, 1994
Foundation Drawing	Summit Manufacturing Drawing #1237-F1 dated October 10, 1994
Geotechnical Report	French & Parrello Project #93N035CR1, dated November 2, 1993
Modifications	ATC Job #42659834, dated January 16, 2009
	ATC Job #43915332, dated September 2, 2009
	ATC Job #56682734, dated April 16, 2014

Analysis

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

Basic Wind Speed:	97 mph (3-Second Gust, V _{asd}) / 125 mph (3-Second Gust, V _{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	
Exposure Category:	В
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$Ss = 0.19, S_1 = 0.06$
Site Class:	D - Stiff Soil

Conclusion

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

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



Existing and Reserved Equipment

Elevation ¹ (ft)		Qty	Antonno	Mount Tree	Lines	Carrier	
Mount	Mount RAD		Antenna	Mount Type	Lines	Carrier	
		2	DragonWave Horizon Compact				
		6	Alcatel-Lucent RRH2x50-08	1			
		3	Alcatel-Lucent 1900MHz 4x45 RRH	_	(6) 5/16" Coax		
			Alcatel-Lucent		(6) 15/8" Coax		
		3	TD-RRH8x20-25 w/ Solar Shield		(4) 1 1/4" Hybriflex	Clearwire	
183.0	185.0	3	Argus LLPX310R	Platform w/ Handrails	(3) 1/2" Coax		
		2	DragonWave A-ANT-18G-2-C		(2) 2" Conduit		
		3	Andrew 844G65VTZASX				
		3	KMW ETCR-654L12H6				
		6	Decibel DB844H90E-XY	1	(12) 1 F /0" Coox	Conint Nortal	
		3	Andrew 844G65VTZASX		(12) 1 5/8" Coax	Sprint Nextel	
171.0	171.0	3	RFS APXV18-206517S-C	Flush	(6) 1 5/8" Coax	Metro PCS	
		1	Commscope WCS-IMFQ-AMT				
		6	Powerwave LGP21401		(12) 1 1 (4) (22)		
		2	Raycap DC6-48-60-18-8F				
		3	Ericsson RRUS 11 (Band 4)		(12) 1 1/4" Coax (4) 0.78" 8 AWG 6		
167.0	167.0	3	Ericsson RRUS 32 B2	Platform w/ Handrails	(2) 0.39" Fiber Trunk	AT&T Mobility	
		3	Ericsson RRUS-32		(2) 0.39 Fiber Truffk (2) 2" Conduit		
		3	Powerwave 7770.00	1	(2) 2 Conduit		
		3	CCI OPA-65R-LCUU-H4				
		3	Quintel QS66512-2				
		3	Kathrein Smart Bias Tee		(18) 1 5/8" Coax		
146.0	146.0	3	Andrew ETW200VS12UB	Sector Frames		T-Mobile	
146.0	146.0	3	Andrew ETW190VS12UB	Sector Frames		1-Mobile	
		3	Andrew SBNHH-1D65A				
		6	RFS FD9R6004/1C-3L				
		3	Alcatel-Lucent RRH2X60-1900A-4R				
		3	Alcatel-Lucent RRH2X60-AWS				
		3	Alcatel-Lucent RRH2x40-AWS		(12) 1 5/8" Coax		
127.0	127.0	2	RFS DB-T1-6Z-8AB-0Z	Platform w/ Handrails	(2) 1 1/4" Hybriflex	Verizon	
		3	Andrew HBXX-6516DS-A2M		(2) 1 5/8" Fiber		
		3	Andrew LNX-4514DS-A1M				
		3	Antel BXA-80063/6CF				
		3	Andrew HBXX-6517DS-A2M				
7.0	7.0	2	Thales PCS VP/360/2 Type 8100	Stand-Off	-	T-Mobile	

Equipment to be Removed

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



Proposed Equipment

Elevation ¹ (ft)		Ohi	Antonna	Mount Type	Lines	Corrior
Mount	RAD	Qty	Antenna	Mount Type	Lines	Carrier
167.0	167.0	6	CCI TPX-070821	Platform w/ Handrails	-	AT&T Mobility

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

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	76%	Pass
Shaft	93%	Pass
Base Plate	86%	Pass
Reinforcement	79%	Pass
Termination Bolts	100%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	4,890.6	72%
Axial (Kips)	71.4	4%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
183.0	DragonWave A-ANT-18G-2-C	Clearwire	3.473	2.222
167.0	CCI TPX-070821	AT&T Mobility	2.861	2.139

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



Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

205-215 RESEARCH DR

Location 205-215 RESEARCH DR **Mblu** 91/807/13A6//

Acct# 004864 Owner DAMATO INVESTMENTS LLC

Assessment \$943,480 **Appraisal** \$1,347,830

> **Building Count** 2 **PID** 19613

Current Value

Appraisal					
Valuation Year	Improvements	Land	Total		
2016	\$857,160	\$490,670	\$1,347,830		
	Assessment	·			
Valuation Year	Improvements	Land	Total		
2016	\$600,03	10 \$343,4	70 \$943,480		

Owner of Record

Owner DAMATO INVESTMENTS LLC Sale Price \$0

Other Certificate

Address 183 QUARRY RD **Book & Page** 02289/0578 MILFORD, CT 06460

Sale Date 07/08/1998

Instrument 03

Ownership History

Ownership History						
Owner Sale Price Certificate Book & Page Instrument Sale Date						
DAMATO INVESTMENTS LLC	\$0		02289/0578	03	07/08/1998	
DAMATO JOHN C JR & SUTHERLAND	\$587,500		01942/0499	1	12/31/1992	
DAMATO JOHN C JR & JOHN C	\$587,500		01942/0484	1	12/31/1992	
DAMATO LOUIS J & JOHN C	\$0		01416/0090		12/11/1985	

Building Information

Building 1: Section 1

Year Built: 1988 Living Area: 9,600 Replacement Cost: \$472,416 **Building Percent** 75

Good:

Replacement Cost

Less Depreciation: \$354,310

	\$354,310 ling Attributes				
Field Description					
STYLE	Office/Warehs				
MODEL	Industrial				
Grade	AVERAGE				
Stories:	1				
Occupancy	12				
Exterior Wall 1	Brick/Stn Vene				
Exterior Wall 2					
Roof Structure	Gable/Hip				
Roof Cover	Asph/F Gls/Cmp				
Interior Wall 1	Drywall/Sheet				
Interior Wall 2					
Interior Floor 1	Carpet				
Interior Floor 2	Concr-Finished				
Heating Fuel	Gas				
Heating Type	Hot Air-no Duc				
AC Type	Central				
Bldg Use	IND OFFICE				
Total Rooms					
Total Bedrms	00				
Total Baths	2				
Bath Desc.	2-Full				
1st Floor Use:	4020				
Heat/AC	HEAT/AC PKGS				
Frame Type	WOOD FRAME				
Baths/Plumbing	AVERAGE				
Ceiling/Wall	SUS-CEIL & WL				
Rooms/Prtns	AVERAGE				
Wall Height	10				
% Comn Wall	0				

Building Photo



(http://images.vgsi.com/photos/MilfordCTPhotos//\00\04\59/85...

Building Layout

	240	
40	BAS	∞40
2020	240	8

(http://images.vgsi.com/photos/MilfordCTPhotos//Sketches/1961

	<u>Legend</u>		
Code	Description	Gross Area	Living Area
BAS	First Floor	9,600	9,600
		9,600	9,600

Building 2 : Section 1

Year Built: 1988
Living Area: 11,200
Replacement Cost: \$540,960
Building Percent 75

Good:

Replacement Cost

Less Depreciation: \$405,720

Building Attributes : Bldg 2 of 2

Field	Description
STYLE	Office/Warehs
MODEL	Industrial
Grade	AVERAGE
Stories:	1
Occupancy	14
Exterior Wall 1	Brick/Stn Vene
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	Concr-Finished
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	Central
Bldg Use	IND BLDG MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	2
Bath Desc.	2-Full
1st Floor Use:	4022
Heat/AC	HEAT/AC PKGS
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL
Rooms/Prtns	AVERAGE
Wall Height	10
% Comn Wall	0

Building Photo



(http://images.vgsi.com/photos/MilfordCTPhotos//\00\02\16/16.j

Building Layout

	280	
40	BAS	40
200	280	11/2

(http://images.vgsi.com/photos/MilfordCTPhotos//Sketches/1961

	Building Sub-Areas (sq ft)		
Code	Description	Gross Area	Living Area
BAS	First Floor	11,200	11,200
		11,200	11,200

Extra Features

Extra Features	<u>Legend</u>
No Data for Extra Features	

Land

Land Use		Land Line Valuation		
Use Code	4020	Size (Acres)	2.14	

Description IND OFFICE

Zone ID Neighborhood N Alt Land Appr No

Category

 Frontage
 0

 Depth
 0

Assessed Value \$343,470 **Appraised Value** \$490,670

Outbuildings

	Outbuildings <u>Legend</u>					
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	PAVING-ASPHALT			70000 S.F.	\$97,130	1

Valuation History

Appraisal				
Valuation Year	Improvements	Land	Total	
2016	\$857,160	\$490,670	\$1,347,830	
2013	\$857,160	\$481,500	\$1,338,660	
2012	\$857,160	\$481,500	\$1,338,660	

Assessment				
Valuation Year	Improvements	Land	Total	
2016	\$600,010	\$343,470	\$943,480	
2013	\$600,010	\$337,050	\$937,060	
2012	\$600,010	\$337,050	\$937,060	

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