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 – 10035247 Site ID – CTL02037 USID – 61168 Site Name – NEW HAVEN WHEELER ST MRCTB051762-MRCTB051774-MRCTB052200

69 WHEELER STREET
NEW HAVEN, CT 06512

Latitude: N41-17-45.57
Longitude: W72-53-52.59
Structure Type: Monopole

Report generated date: March 29, 2022
Report by: Sophie Thein
Customer Contact: Evan Giannakas

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
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
Compliant per AT&T Mobility, LLC's Policy?	No

1.2 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

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

RFDS: 10035247_PM201_220309_CTL02037_CBAND

CD's: 10035247_AE201_220315_CTL02037_Rev2_5G NR RADIO_4TXRX ANTENNA RETROFIT_5G NR 1SR CBANDwMINOR RL

RF Powers Used: Max RRH Powers

AT&T Mobility, LLC Duty Cycle: MPE Calculations are modeled with "75% Downlink Duty Cycle" for LTE and 5G.

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1.3 Signage Summary

a. Pre-Site Visit AT&T Signage (Existing Signage)

AT&T Signage Locations	Information 1		Information 2		Notice		Notice 2		Caution		Caution 2		Warning		Warning 2		Barriers	
Access Point(s)																		
Alpha																		
Beta																		
Gamma																		
Delta																		
Epsilon																		
Zeta																		
Status	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A	Existing	N/A

b. Proposed AT&T Signage

AT&T Signage Locations	Information 1		Information 2		Notice		Notice 2		Caution		Caution 2		Warning		Warning 2		Barriers	
Access Point(s)											1							
Alpha																		
Beta																		
Gamma																		
Delta																		
Epsilon																		
Zeta																		
Status	N/A	Remove	N/A	Remove	N/A	Remove	Install	Remove	N/A	Remove	Install	Remove	N/A	Remove	Install	Remove	Install	Remove

Note: The Caution sign proposed at the Monopole Base is a Caution 2B sign.

c. Final Compliance Configuration Signage Summary (Required)

AT&T Signage Locations	Information 1		Information 2		Notice		Notice 2		Caution		Caution 2		Warning		Warning 2		Barriers	
Access Point(s)												1						
Alpha																		
Beta																		
Gamma																		
Delta																		
Epsilon																		
Zeta																		
Status	N/A	N/A	N/A	N/A	N/A	N/A	Existing	Proposed	N/A	N/A	Existing	Proposed	N/A	N/A	Existing	Proposed	Existing	Proposed

Note: The Caution sign required at the Monopole Base is a Caution 2B sign.

Note: The table above represents EVERY compliance item that MUST be implemented at this location.

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2 Scale Maps of Site

The following diagrams are included:

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

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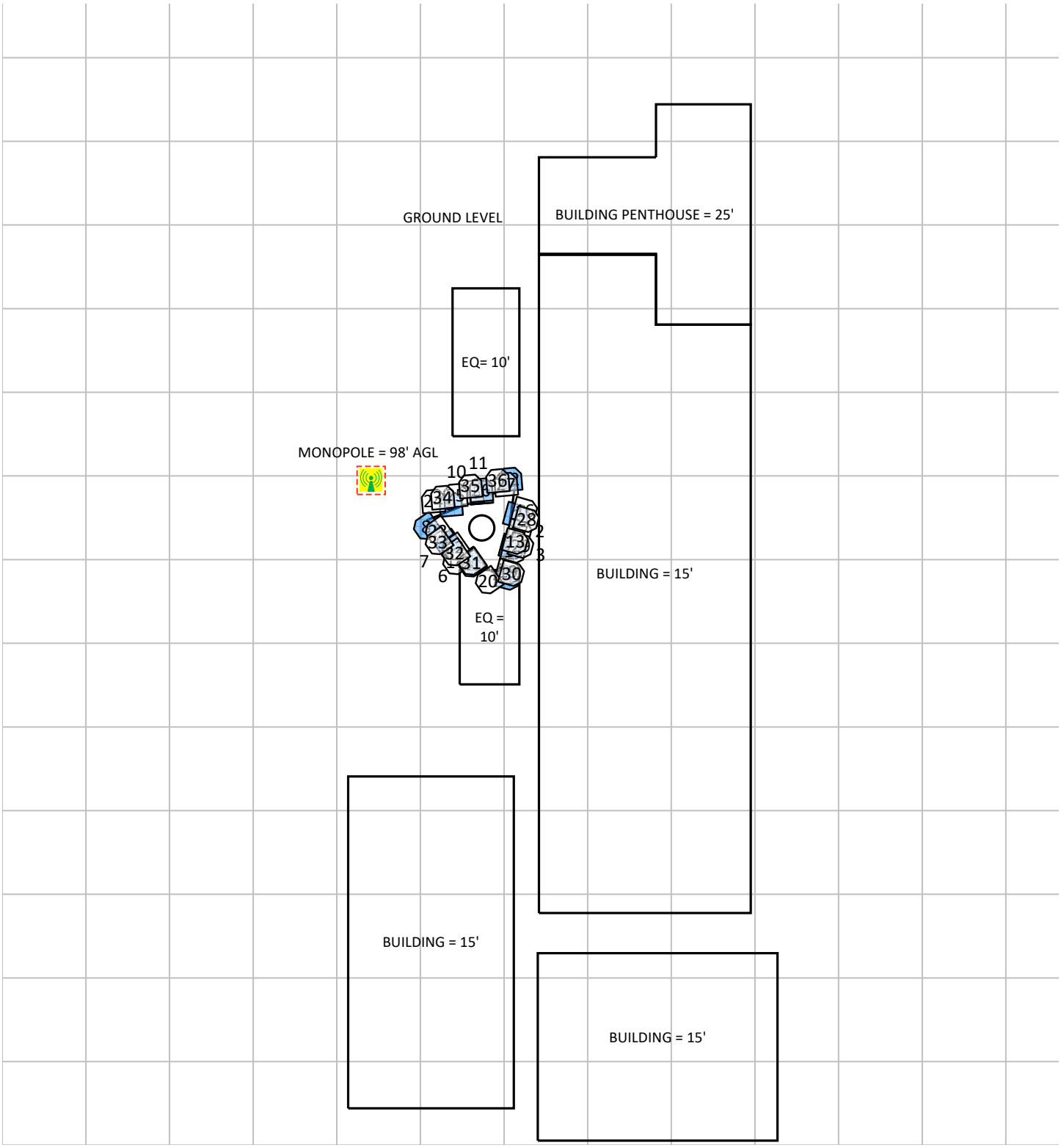
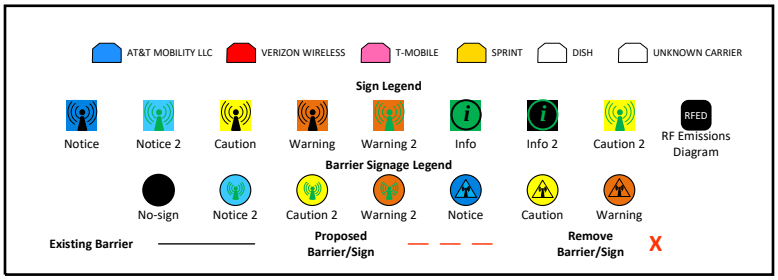
Site Scale Map For: NEW HAVEN WHEELER ST





(Feet)

0 12.6 25.3

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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)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (ft)	AGL (ft)
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	722	LTE	50	68.0	4.3	80	TPO	Watt	1	629.64	10.21	88.9	88.86
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	763	LTE	50	68.0	4.3	160	TPO	Watt	1	1259.27	10.21	88.9	88.86
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	1900	LTE	50	61.0	4.3	80	TPO	Watt	1	1640.93	14.37	88.9	88.86
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	1900	5G	50	61.0	4.3	80	TPO	Watt	1	1640.93	14.37	88.9	88.86
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	2100	LTE/AWS1	50	62.0	4.3	120	TPO	Watt	1	2774.48	14.89	88.9	88.86
1	AT&T MOBILITY LLC (Proposed)	Quintel QD4616-7	Panel	2100	5G	50	62.0	4.3	120	TPO	Watt	1	2774.48	14.89	88.9	88.86
2	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6419 (AT&T C-band)	Panel	3450	5G	50	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	91.5	91.53
3	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6449 (AT&T C-band)	Panel	3700	5G	50	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	87.9	87.93
4	AT&T MOBILITY LLC	Cci OPA65R-BU4D	Panel	737	LTE	50	61.1	4	160	TPO	Watt	1	1330.82	10.45	89	89
4	AT&T MOBILITY LLC	Cci OPA65R-BU4D	Panel	850	5G	50	66.7	4	160	TPO	Watt	1	1527.99	11.05	89	89
4	AT&T MOBILITY LLC	Cci OPA65R-BU4D	Panel	2300	LTE	50	56.1	4	100	TPO	Watt	1	2137.96	14.55	89	89
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	2100	LTE/AWS1	180	61.0	6	120	TPO	Watt	1	3282.32	15.62	88	88
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	2100	5G	180	61.0	6	120	TPO	Watt	1	3282.32	15.62	88	88
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	722	LTE	180	73.0	6	80	TPO	Watt	1	887.34	11.70	88	88
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	763	LTE	180	73.0	6	160	TPO	Watt	1	1774.68	11.70	88	88
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	1900	LTE	180	66.0	6	80	TPO	Watt	1	1807.55	14.79	88	88
5	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	1900	5G	180	66.0	6	80	TPO	Watt	1	1807.55	14.79	88	88
6	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6419 (AT&T C-band)	Panel	3450	5G	180	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	91.5	91.53
7	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6449 (AT&T C-band)	Panel	3700	5G	180	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	87.9	87.93
8	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	737	LTE	180	61.1	5.9	160	TPO	Watt	1	1841.28	11.86	88	88.04
8	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	850	5G	180	67.9	5.9	160	TPO	Watt	1	1884.17	11.96	88	88.04
8	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	2300	LTE	180	48.7	5.9	100	TPO	Watt	1	397191.55	37.24	88	88.04
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	722	LTE	300	73.0	6	80	TPO	Watt	1	887.34	11.70	88	88
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	763	LTE	300	73.0	6	160	TPO	Watt	1	1774.68	11.70	88	88
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	1900	LTE	300	66.0	6	80	TPO	Watt	1	1807.55	14.79	88	88
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	1900	5G	300	66.0	6	80	TPO	Watt	1	1807.55	14.79	88	88
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	2100	LTE/AWS1	300	61.0	6	120	TPO	Watt	1	3282.32	15.62	88	88
9	AT&T MOBILITY LLC (Proposed)	Quintel QD6616-7	Panel	2100	5G	300	61.0	6	120	TPO	Watt	1	3282.32	15.62	88	88
10	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6419 (AT&T C-band)	Panel	3450	5G	300	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	91.5	91.53
11	AT&T MOBILITY LLC (Proposed)	Ericsson AIR6449 (AT&T C-band)	Panel	3700	5G	300	11.0	2.6	108.48	TPO	Watt	1	24285.65	23.50	87.9	87.93
12	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	737	LTE	300	61.1	5.9	160	TPO	Watt	1	1841.28	11.86	88	88.04
12	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	850	5G	300	67.9	5.9	160	TPO	Watt	1	1884.17	11.96	88	88.04

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Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (ft)	AGL (ft)
12	AT&T MOBILITY LLC	CCI Antennas OPA65R-BU6D	Panel	2300	LTE	300	48.7	5.9	100	TPO	Watt	1	397191.55	37.24	88	88.04
13	UNKNOWN CARRIER	Generic	Panel	1900		50	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	94.9	94.86
14	UNKNOWN CARRIER	Generic	Panel	1900		180	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	94.9	94.86
15	UNKNOWN CARRIER	Generic	Panel	1900		300	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	94.9	94.86
16	UNKNOWN CARRIER	Generic	Panel	700		50	65.0	6.3	160	TPO	Watt	1	2884.83	12.56	76.9	76.86
17	UNKNOWN CARRIER	Generic	Panel	850		50	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	76.9	76.86
18	UNKNOWN CARRIER	Generic	Panel	1900		50	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	76.9	76.86
19	UNKNOWN CARRIER	Generic	Panel	2100		50	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	76.9	76.86
20	UNKNOWN CARRIER	Generic	Panel	700		180	65.0	6.3	160	TPO	Watt	1	2884.83	12.56	76.9	76.86
21	UNKNOWN CARRIER	Generic	Panel	850		180	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	76.9	76.86
22	UNKNOWN CARRIER	Generic	Panel	1900		180	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	76.9	76.86
23	UNKNOWN CARRIER	Generic	Panel	2100		180	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	76.9	76.86
24	UNKNOWN CARRIER	Generic	Panel	700		300	65.0	6.3	160	TPO	Watt	1	2884.83	12.56	76.9	76.86
25	UNKNOWN CARRIER	Generic	Panel	850		300	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	76.9	76.86
26	UNKNOWN CARRIER	Generic	Panel	1900		300	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	76.9	76.86
27	UNKNOWN CARRIER	Generic	Panel	2100		300	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	76.9	76.86
28	UNKNOWN CARRIER	Generic	Panel	850		50	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	66.9	66.86
29	UNKNOWN CARRIER	Generic	Panel	1900		50	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	66.9	66.86
30	UNKNOWN CARRIER	Generic	Panel	2100		50	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	66.9	66.86
31	UNKNOWN CARRIER	Generic	Panel	850		180	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	66.9	66.86
32	UNKNOWN CARRIER	Generic	Panel	1900		180	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	66.9	66.86
33	UNKNOWN CARRIER	Generic	Panel	2100		180	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	66.9	66.86
34	UNKNOWN CARRIER	Generic	Panel	850		300	65.0	6.3	160	TPO	Watt	1	3524.68	13.43	66.9	66.86
35	UNKNOWN CARRIER	Generic	Panel	1900		300	65.0	6.3	160	TPO	Watt	1	6762.7	16.26	66.9	66.86
36	UNKNOWN CARRIER	Generic	Panel	2100		300	65.0	6.3	160	TPO	Watt	1	5716.37	15.53	66.9	66.86

Note: The Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. 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.

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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 LEVEL = 0'
- MONOPOLE = 98'
- BUILDING = 15'
- BUILDING PH = 25'
- EQ = 10'

The Antenna Inventory heights are referenced to the same level.

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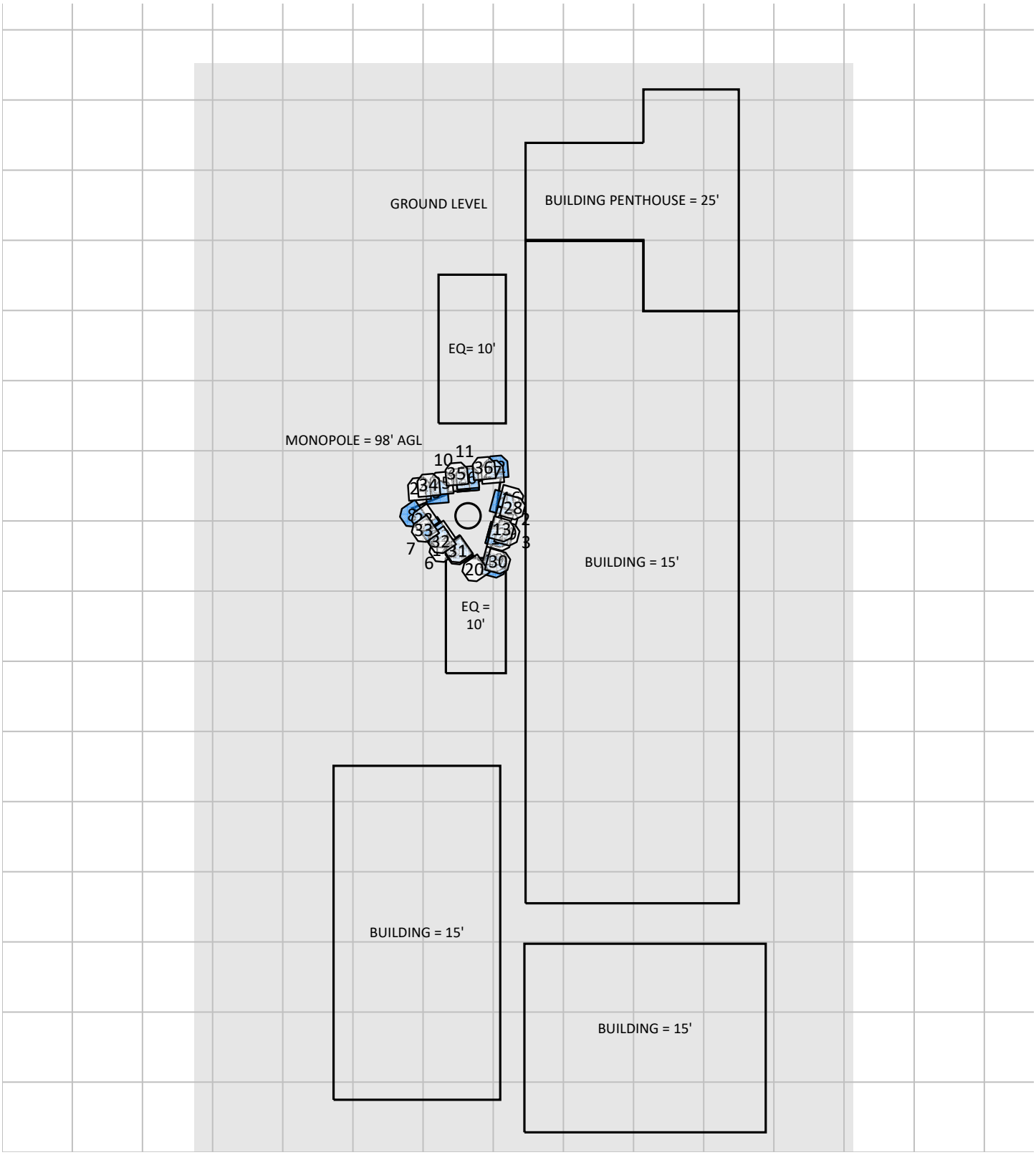
RF Exposure Simulation For: NEW HAVEN WHEELER ST
Composite View



% of FCC Public Exposure Limit

0-5	5-100	100-500	500-5000	5000+

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | DISH | UNKNOWN CARRIER

Barrier Signage Legend

No-sign | Notice | Caution | Warning

Existing Barrier | **Proposed Barrier/Sign** | **Remove Barrier/Sign** X

(Feet)

0 12.3 24.5

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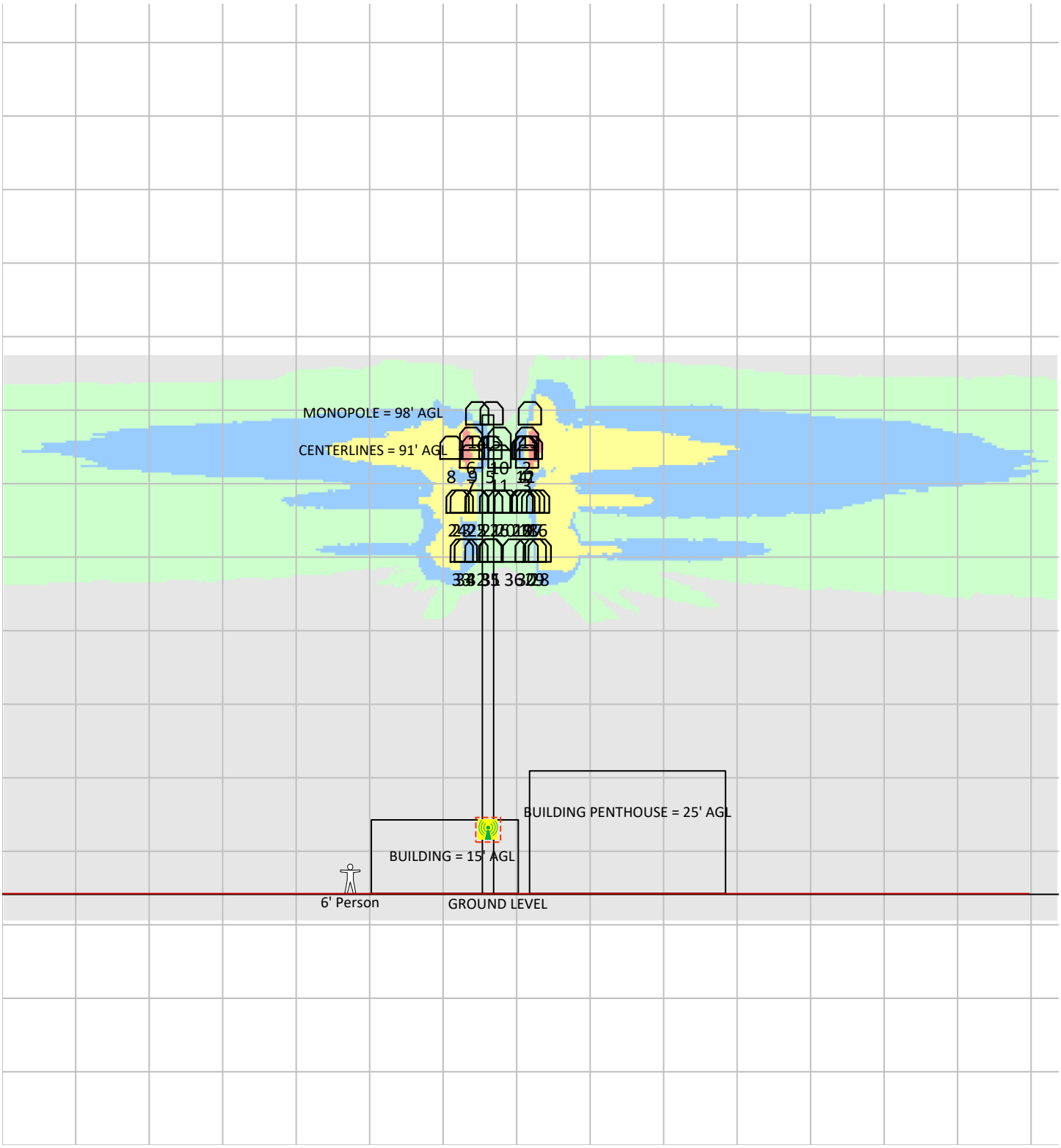
3/29/2022 3:11:22 PM

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

RF Exposure Simulation For: NEW HAVEN WHEELER ST
Elevation View



% of FCC Public Exposure Limit

0-5	5-100	100-500	500-5000	5000+

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | DISH | UNKNOWN CARRIER

Sign Legend

Notice | Notice 2 | Caution | Warning | Warning 2 | Info | Info 2 | Caution 2 | RF Emissions Diagram

Barrier Signage Legend

No-sign | Notice 2 | Caution 2 | Warning 2 | Notice | Caution | Warning

Existing Barrier | **Proposed Barrier/Sign** | **Remove Barrier/Sign** X

(Feet)

0 14.4 28.8

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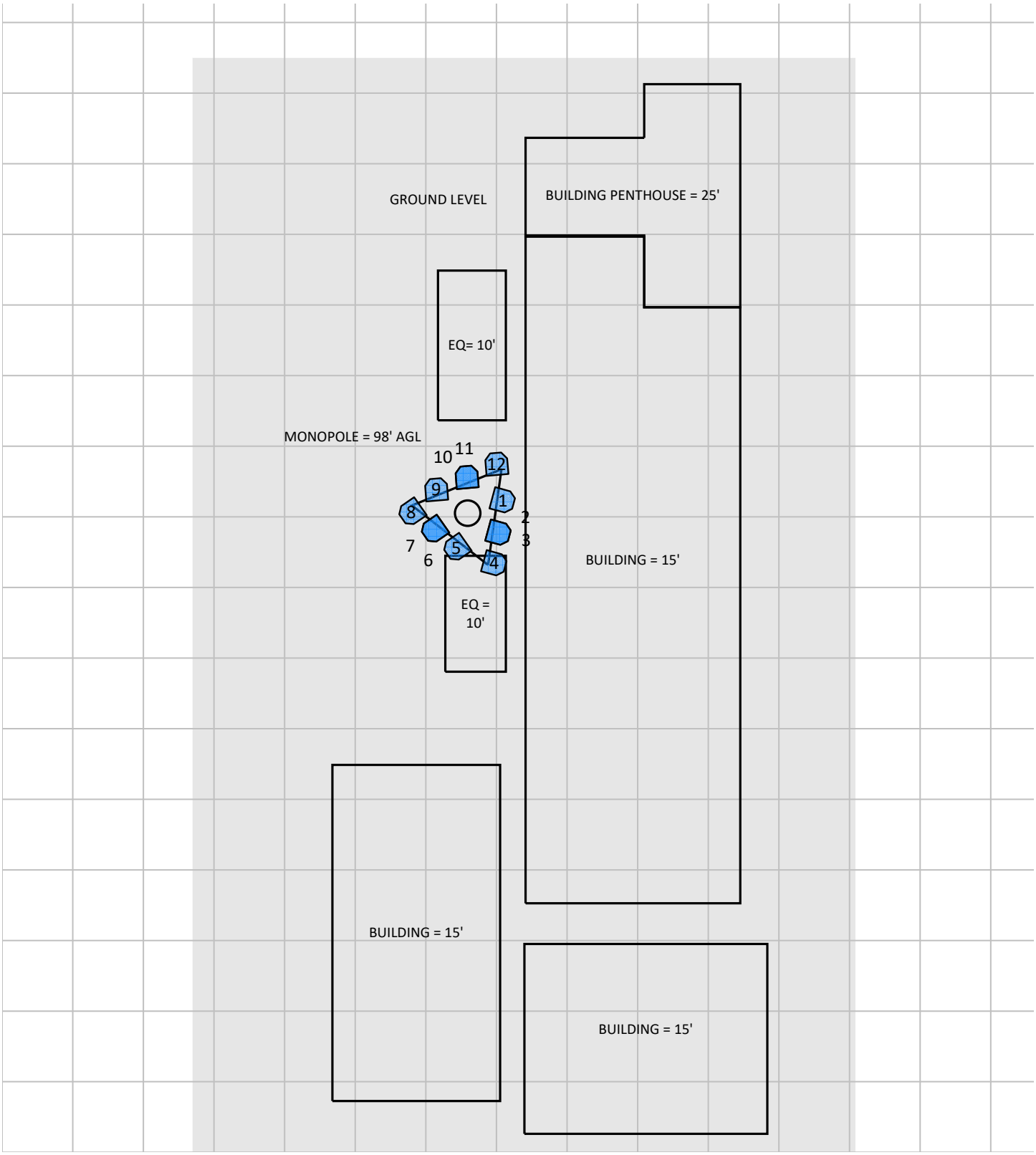
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

RF Exposure Simulation For: NEW HAVEN WHEELER ST
AT&T Mobility Contribution



% of FCC Public Exposure Limit

0-5	5-100	100-500	500-5000	5000+

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | DISH | UNKNOWN CARRIER

Barrier Signage Legend

No-sign | Notice | Caution | Warning

Existing Barrier ——— **Proposed Barrier/Sign** — — — **Remove Barrier/Sign** X

(Feet)

0 12.2 24.4

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3/29/2022 3:10:50 PM

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

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.

Based on measurement or predictions, other wireless operators on this site may be out of RF exposure compliance with FCC regulations on this site. We recommend that those operators review this site with respect to RF exposure compliance.

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:

Monopole Base Location

(1) Caution 2B sign is required.

Notes:

- There are no adjacent structures within the potential exposure areas of the AT&T Mobility, LLC C-Band antennas.

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6 Reviewer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms:

That I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Site Safe, 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 Electromagnetic Fields; 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 Sophie Thein.

March 29, 2022

Young Min Kim

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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.

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Appendix B – Regulatory Background Information

AT&T Mobility, LLC policies

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.

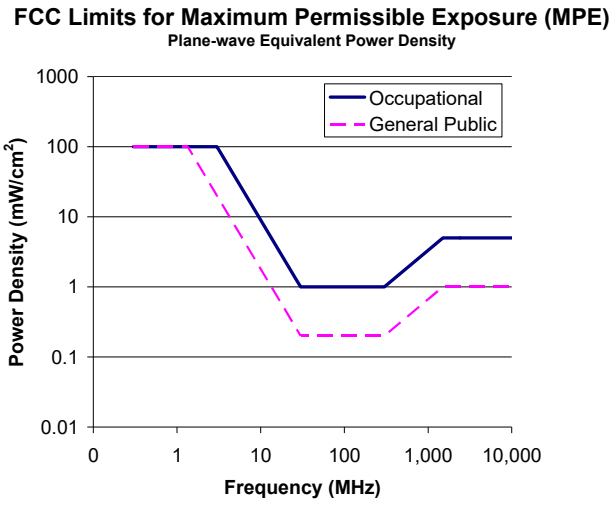
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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:



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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^2)	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
1500-100,000	--	--	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^2)	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
1500-100,000	--	--	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 Lockout/Tagout procedure aimed to control the unexpected energization or startup of machines when maintenance or service is being performed.

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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 worker's 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, unless otherwise noted. 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.

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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. **Gray areas are accessible to anyone**.
- 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.

If trained occupational personnel require access to areas that are delineated as above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the carriers to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

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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 assumed a 100% duty cycle or another duty cycle as noted in this report.

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.

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Appendix F – 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 for taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields 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) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

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

General Population/Uncontrolled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **unaware** of the potential for exposure and who have no control over 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 its 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 rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC as an area where RF 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.

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OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of RF exposure 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 Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

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 energy a 6-foot tall human body will absorb while present in an electromagnetic field of energy.

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.

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Appendix G – References

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

Site Safe, 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
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-Ionizing Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

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