

RADIO FREQUENCY - ELECTROMAGNETIC ENERGY (RF-EME) COMPLIANCE REPORT

Report Type: Antenna Modification/Theoretical

Site ID: SF72032M

Site Name: SF2032 The Square

Address: 2045 Novato Boulevard Novato, CA 94947

Date of Calculation: July 5, 2024

Date of Report: July 5, 2024

Latitude: 38.111134 N
Longitude: -122.593234 W



Prepared By:



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1.0 Executive Summary / Report Summary

Purpose of Report

Global Technology Associates (GTA) has been contracted by T-Mobile to conduct radio frequency electromagnetic (RF-EME) modeling for T-Mobile site **SF72032M** located at **2045 Novato Boulevard Novato, CA 94947** to determine RF-EME exposure levels from existing and proposed T-Mobile wireless communications equipment at this site.

This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields. This report contains a detailed summary of the RF-EME analysis for the site. As described in greater detail in Section named **“Federal Communications Commission (FCC) Requirements”** of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general population exposures and occupational exposures. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

T-Mobile Site Summary			
Site ID	SF72032M	Street Address	2045 Novato Boulevard
Site Name	SF2032 The Square	City, State, Zip	Novato, CA 94947
Site Type	building	Latitude	38.111134 N
Classification	general population	Longitude	-122.593234 W
Access Restrictions	uncontrolled	Access Type	ladder to roof
Site Description	all the antennas are mounted on the roof of the building		
Max Predictive (Recalibrated) RF-EME at T-Mobile Facility (General Population)	4495.900% of FCC’s general population limit at roof level		
Max On-Site RF-EME at T-Mobile Facility (General Population for existing antennas)	97.200% of FCC’s general population limit at roof level		
Max Predictive RF-EME at Ground Level (General Population for proposed antennas)	77.000% of FCC’s general population limit		
Max On-Site RF-EME at Ground Level (General Population for existing antennas)	1.250% of FCC’s general population limit		
Predictive RF-EME Analysis at T-Mobile Facility	The Proposed Antenna Configuration is In Compliance With FCC Rules & Regulations Upon Completion of the GTA Recommendations		

Table 1

Site ID: SF72032M

A result of over 100% does not make a site out of compliance with FCC guidelines. For predicted EME over 100% of the applicable FCC limit, further remediation (e.g. signage and/or barriers preventing access) is required to consider the site compliant. Areas exceeding the FCC limit are presented with the barriers and appropriate signages. Accessible areas outside the demarcated are the safety zones that have predicted EME values below the FCC's limits. Installation of the recommended mitigation or remediation measures brings the site into compliance. The predictions models antennas as if they are operating at full power, and this assumption yields a worst case scenario with more conservative results. On-site measurements may yield different results, as antennas do not always operate at full capacity.

Methodology

The site to be determined as the compliance is based on theoretical modeling using RoofView® modeling tool, appropriate RF signage placement recommendations, proposed antenna inventory as provided by T-Mobile in the construction drawings and the type & level of restricted access to the antennas at the site.

Compliance Statement

T-Mobile's operation at **2045 Novato Boulevard Novato, CA 94947** will comply with FCC rules and regulations upon completion of recommendations that includes the installation of appropriate RF Safety Signages and/or Barriers as described in Section 10 and Appendix A.

Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. If required, RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Where applicable, barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

T-Mobile will be compliant when the following changes are implemented:

T-Mobile proposed Access Point Location

Ensure that a 1 Guideline, 1 Information & 1 Notice signs are installed at the Access Point location, as depicted in the site map in the later sections of the report.

T-Mobile proposed Alpha Sector Location

2 Caution sign on the antenna as depicted in the site map in the later sections of the report.
Install Striping that is 360 Sq. ft. long along with 6 Caution sign on the Striping as depicted in the site map in the later sections of the report.

T-Mobile proposed Beta Sector Location

1 Caution sign on the antenna as depicted in the site map in the later sections of the report.
Install Striping that is 256 Sq. ft. long along with 4 Caution sign on the Striping as depicted in the site map in the later sections of the report.

T-Mobile proposed Gamma Sector Location

1 Caution sign on the antenna as depicted in the site map in the later sections of the report.

Site ID: SF72032M

Install Striping that is 225 Sq. ft. long along with 3 Caution sign on the Striping as depicted in the site map in the later sections of the report.

T-Mobile proposed Equipment/BTS Location

Ensure that a 1 Guideline, 1 Information & 1 Notice signs are installed at the Equipment/BTS location, as depicted in the site map in the later sections of the report.

2.0 MPE Calculations

For this MPE predictive analysis, GTA considered the area around the accessible areas of the T-Mobile antennas on the site to determine EME field strength levels with respect to the FCC's human exposure limits. Further GTA has identified any areas with higher levels exceeding FCC MPE limits and then determined spatially averaged field levels in areas with highest fields.

GTA has utilized computer generated modeling software RoofView® 4.15 to generate the compliance report.

Modeling & Input Assumptions

In this Site Compliance Report, it is assumed that

- All antennas are operating at full power at all times.
- The Antenna Inventory Table (Section 3) shows all transmitting antennas at the site.
- A 75% duty cycle and maximum radiated power for each antenna is assumed unless T-Mobile has specified otherwise.
- Obstructions like (screens, trees, buildings etc.) that would normally attenuate the signal are not taken into account.
- GTA obtained information used in this Compliance Report from T-Mobile which is considered reliable and believes them to be true and correct.
- Due to the complexity of some wireless sites, GTA performed this analysis and created this report utilizing best industry practices and due diligence. The scales and the determinations are based on the A&E drawings provided by T-Mobile.

3.0 Antenna Inventory

ID	Technology	Frequency (MHz)	Input Power (Watts)	ERP (Watts)	Antenna Make	Antenna Model	Antenna Gain (dBd)	Azimuth (°)	Bottom of ANT from Main Roof (ft)	Bottom of ANT from Ground (ft)
S1A1	N600	600.00000	160.0000	2506.8017	RFS	APXVAALL18_43-U-NA20	11.95	60	2.08	25.42
S1A1	L700	700.00000	40.0000	753.4596	RFS	APXVAALL18_43-U-NA20	12.75	60	2.08	25.42
S1A1	L1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	60	2.08	25.42
S1A1	N1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	60	2.08	25.42
S1A1	L2100	2100.00000	160.0000	6904.3052	RFS	APXVAALL18_43-U-NA20	16.35	60	2.08	25.42
S1A4	N2500	2500.00000	200.0000	36815.4400	ERICSSON	AIR6419 B41	22.65	60	5.15	28.49
S2A2	N600	600.00000	160.0000	2506.8017	RFS	APXVAALL18_43-U-NA20	11.95	180	2.08	25.42
S2A2	L700	700.00000	40.0000	753.4596	RFS	APXVAALL18_43-U-NA20	12.75	180	2.08	25.42
S2A2	L1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	180	2.08	25.42
S2A2	N1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	180	2.08	25.42
S2A2	L2100	2100.00000	160.0000	6904.3052	RFS	APXVAALL18_43-U-NA20	16.35	180	2.08	25.42
S2A5	N2500	2500.00000	200.0000	36815.4400	ERICSSON	AIR6419 B41	22.65	180	5.15	28.49
S3A3	N600	600.00000	160.0000	2506.8017	RFS	APXVAALL18_43-U-NA20	11.95	300	2.08	25.42
S3A3	L700	700.00000	40.0000	753.4596	RFS	APXVAALL18_43-U-NA20	12.75	300	2.08	25.42
S3A3	L1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	300	2.08	25.42
S3A3	N1900	1900.00000	160.0000	6443.4725	RFS	APXVAALL18_43-U-NA20	16.05	300	2.08	25.42
S3A3	L2100	2100.00000	160.0000	6904.3052	RFS	APXVAALL18_43-U-NA20	16.35	300	2.08	25.42
S2A6	N2500	2500.00000	200.0000	36815.4400	ERICSSON	AIR6419 B41	22.65	300	5.15	28.49

Table 2

4.0 Signage at the Facility Identifying All WTS Equipment

AND SAFETY PRECAUTIONS FOR PEOPLE NEARING THE EQUIPMENT AS MAY BE REQUIRED BY THE APPLICABLE FCC ADOPTED STANDARDS

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. It is recommended that additional signage be installed for the new antennas making people aware of the antennas locations. The plan should be that there are no exposures above the FCC limits in front of the proposed antennas, however, wherever the exposures exceed the FCC limits in the front of the proposed antennas, barriers are recommended to control the areas with the exposures that are above the FCC limits. Additionally, there are areas where workers elevated above the roof/structure may be exposed to power densities greater than the general population and/or occupational limits. Workers and the general population should be informed about the presence and locations of antennas and their associated fields. Access to this site is considered open to public or occupational, based on the controls for access to the facility/structure, the assumption was made that there were no security mechanisms in place for general population and security mechanisms in place for the occupational population at the site for purposes of this report unless otherwise specified specifically by T-Mobile.

5.0 Statement on Who Produced This Report and Qualifications

Please see the certifications attached in Appendix A below.

6.0 Federal Communications Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radio frequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general population/uncontrolled exposure limits for members of the general population.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

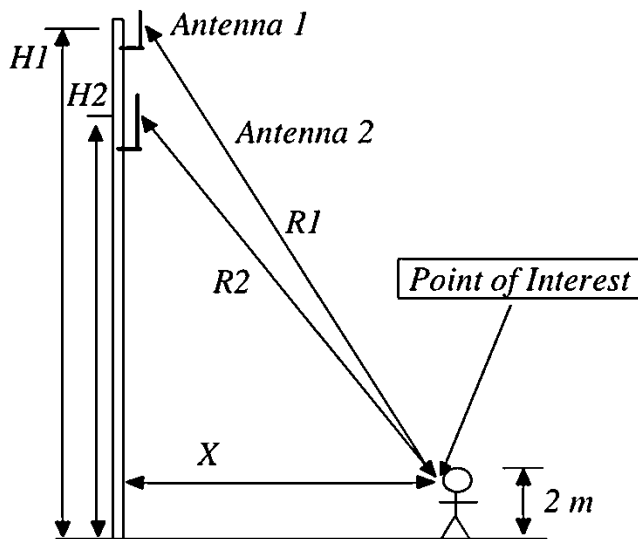


Figure 1

Table 3 and Figure 2 (below), which are included within the FCC’s OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are “time-averaged” limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC’s MPEs are measured in terms of power (mW) over a unit surface area (cm²). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm²) and an uncontrolled MPE of 1 mW/cm² for equipment operating in the 1900 MHz frequency range. For the T-Mobile equipment operating at 800 MHz, the FCC’s occupational MPE is 2.66 mW/cm² and an uncontrolled MPE of 0.53 mW/cm². These limits are considered protective of these populations.

(A) Limits for Occupational/Controlled Exposure				
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	6 4	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
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	6 4	1.63	(100)*	30
1.34-30	1842/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

Table 3

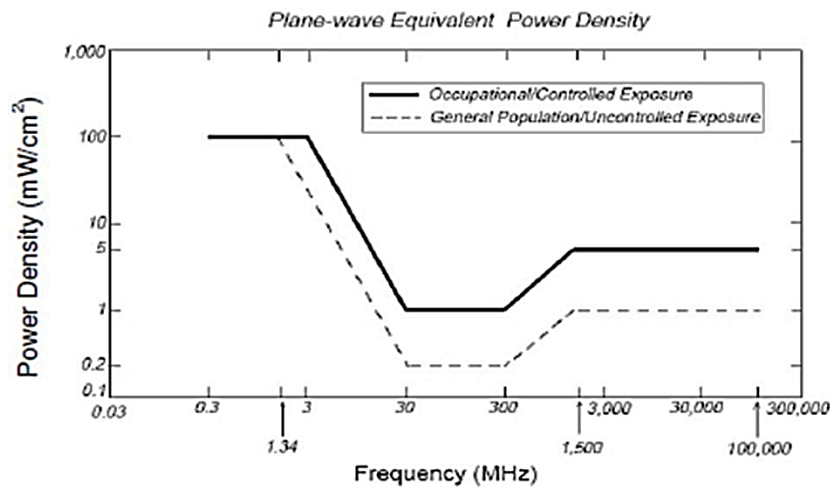


Figure 2

Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Cellular Telephone	870 MHz	2.90 mW/cm ²	0.58 mW/cm ²
Specialized Mobile Radio	855 MHz	2.85 mW/cm ²	0.57 mW/cm ²
Most Restrictive Freq. Range	30-300 MHz	1.00 mW/cm ²	0.20 mW/cm ²

Table 4

Personal Communication (PCS) facilities used by T-Mobile in this area operate within a frequency range of 600-2500 MHz. Facilities typically consist of:

- 1) Electronic transceivers (the radios or cabinets) connected to wired telephone lines; and
- 2) Antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

Statement of Compliance

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 100% of the applicable MPE must participate in mitigating these RF hazards.

7.0 Limitations

This report was prepared for the use of T-Mobile. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by GTA are based solely on the information provided by T-Mobile. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to GTA so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

8.0 Safety Recommendations

Occupational Safety and Health Administration (OSHA) Requirements

OSHA requires that those in the Occupational classification must complete training in RF Safety, RF Awareness, and Utilization of Personal Protective Equipment. OSHA also provides options for Hazard Prevention and Control:

Hazard Prevention	Control
<ul style="list-style-type: none"> Utilization of good equipment Enact control of hazard areas Limit exposures Employ medical surveillance and accident response 	<ul style="list-style-type: none"> Employ Lockout/Tag out Utilize personal alarms & protective clothing Prevent access to hazardous locations Develop or operate an administrative control program

Table 5

RF Signage and Barriers

All RF signs should be obeyed by at all times.



Figure 3

If there are workers in an area with a sign that they do not understand, they can call the NOC Number at 877-611-5868 for guidance.

9.0 Federal Communications Commission (FCC) Limits

Contribution to Co-Located areas

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. All co-located sites should have a separate 5% modeling that shows only T-Mobile antennas transmitting. This separate modeling indicates T-Mobile's contribution in all areas that is recognized to be greater 100% MPE limits.

Occupational Limits

Apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

General Population limits

Apply in situations in which the general population may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. (Those without significant and documented RF Safety & Awareness training)

Controlled Environment

Applies to environments that are restricted or "controlled" in order to prevent access from members of the General Population classification.

Uncontrolled Environment

Applies to environments that are unrestricted or "uncontrolled" that allow access from members of the General Population classification.

Generic Values

The use of "Unknown" for an operator means the information with regard to the carrier, their FCC license and / or antenna information was not available. Generic values used as estimation for Effective Radiated Power (ERP) and antenna characteristics for unknown antennas.

10.0 Compliance Measures

The site needs the following mitigation and/or compliance plan.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. At the time of our analysis, T-Mobile will be compliant with the FCC rules and regulations, as described in OET Bulletin 65 upon implementation of below remediation and/or compliance recommendations.

On building :

Recommendations for Site Compliance	Signages on Access Points, Sectors & Equipment										Enclosing Sectors			
	Guidelines		NOC INFO		NOTICE		CAUTION		DANGER		Sign	Count	Length	Striping
Access Point(s)	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			Striping
Sector Alpha	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	2	<input type="checkbox"/>		<input checked="" type="checkbox"/>	6	360 Sq. ft.	Striping
Sector Beta	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	1	<input type="checkbox"/>		<input checked="" type="checkbox"/>	4	256 Sq. ft.	Striping
Sector Gamma	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	1	<input type="checkbox"/>		<input checked="" type="checkbox"/>	3	225 Sq. ft.	Striping
Equipment/BTS	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			Striping
Total Signage	2	2	2	2	2	2	4	0	0	0	13		841 Sq. ft.	

Table 6

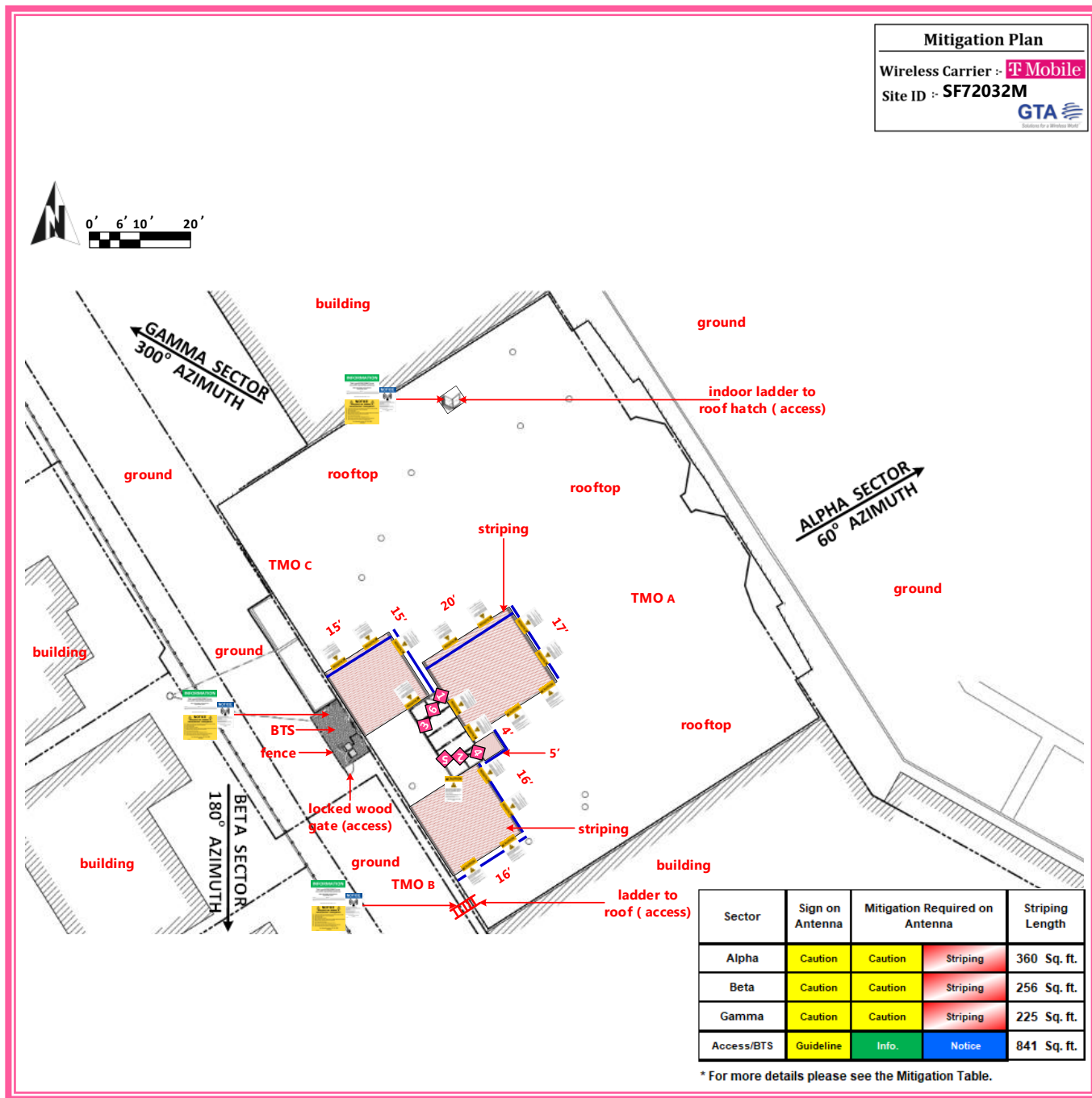
CAUTION: - The table above represents EVERY compliance item that MUST be implemented by the carrier at the site location; please see the Site Plan shown in diagram 1.

It is recommended to have periodic inspections of the components that are involved in radiation of RF energy. Periodic Electromagnetic Emission (EME) measurement should be conducted to reevaluate the RF radiation level at this site.




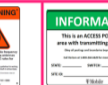

GTA recommends that T-Mobile and the authorized personal at the site take additional measures to ensure that persons accessing the roof (for example, roofers or other maintenance workers) are informed of areas where RF levels exceed the FCC general population limit and made aware that these areas must be avoided to maintain compliance with FCC requirements. This is important especially when the placement of barriers, striping, taping or any other positive access control (areas of the roof that exceed the RF levels of general population limit) is not possible due to the physical construction or constraints or safety measures surrounding the antennas or on the roof like sloped roof, tiled roof, chimney, steeples, cupolas, hilly terrain, etc.

It is further recommended to distribute this report to anyone accessing the roof and ensuring the confirmation that it has been read and understood.

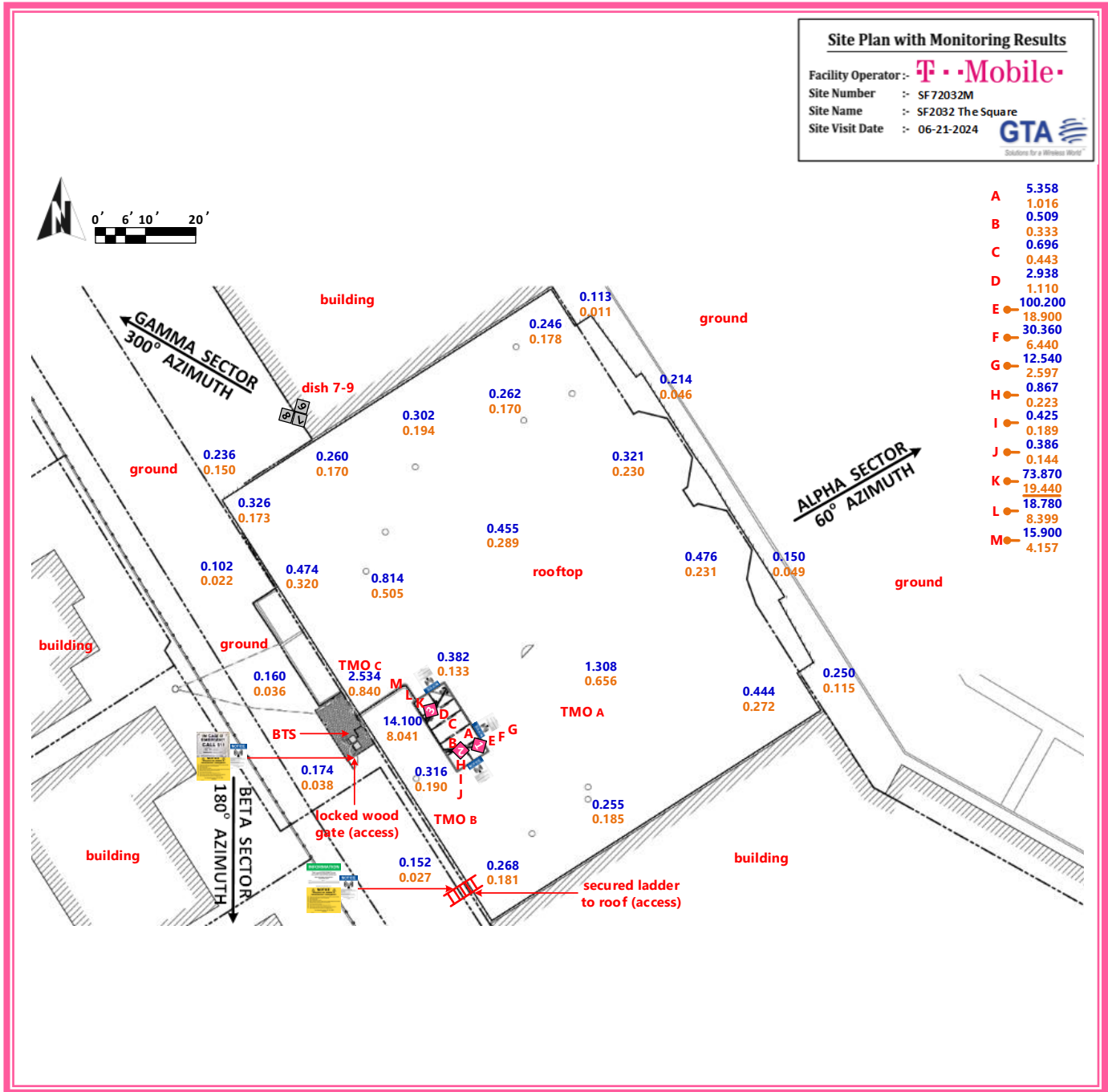
Diagram 1: Site Scale Plan



◆ T-Mobile Antennas
 Striping
 Physical Measurement
▶ ENTRY Important Notes
Standard uses 'FCC exposure limits of 5.0 mW/cm2 for occupational and 1.0 mW/cm2 for general population'

				
GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO

On-Site T-Mobile's RF measurements at roof & ground level for the occupational standard for the existing antennas On-Site



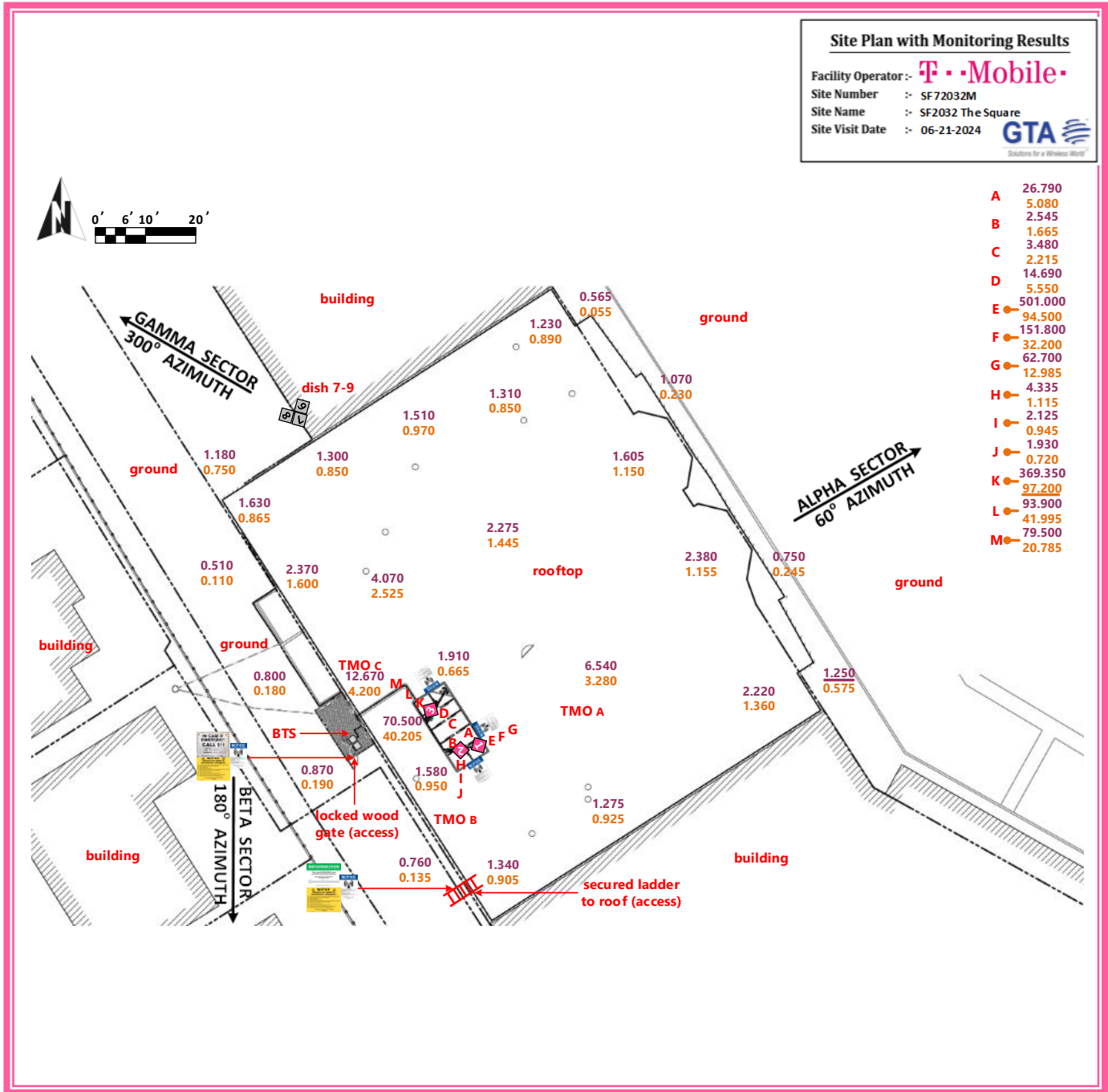
Site Plan with Monitoring Results

Facility Operator: **T-Mobile**
 Site Number: SF72032M
 Site Name: SF2032 The Square
 Site Visit Date: 06-21-2024

A	5.358
B	1.016
C	0.509
D	0.333
E	0.696
F	0.443
G	2.938
H	1.110
I	100.200
J	18.900
K	30.360
L	6.440
M	12.540
	2.597
	0.867
	0.223
	0.425
	0.189
	0.386
	0.144
	73.870
	19.440
	18.780
	8.399
	15.900
	4.157

	T-Mobile Antennas	%	RF Max Roof-Top and/or Occupational Population Area Measurement
	T-Mobile MW Dish Antennas	%	RF Max Ground and/or General Population Area Measurement
	Other(s) Antennas(s)	%	RF Max Spatial Average Measurement
	Other(s) MW Dish Antennas(s)	%	RF Max Spatial Average Measurement
	RF Signage	ENTRY	Important Notes

On-Site T-Mobile's RF measurements at roof & ground level for the general population standard for the existing antennas On-Site



	T-Mobile Antennas	%	RF Max Roof-Top and/or Occupational Population Area Measurement
	T-Mobile MW Dish Antennas	%	RF Max Ground and/or General Population Area Measurement
	Other(s) Antennas(s)	%	RF Max Spatial Average Measurement
	Other(s) MW Dish Antennas(s)	%	RF Max Spatial Average Measurement
	RF Signage	ENTRY	Important Notes

11.0 Summary And Conclusions

GTA has prepared this Radiofrequency Emissions Compliance Report for the proposed T-Mobile telecommunications equipment at the site located at **2045 Novato Boulevard Novato, CA 94947**.

GTA has conducted theoretical modeling to estimate the worst-case power density from T-Mobile antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements.

As presented in the preceding sections, based on worst-case predictive modeling, **there are modeled exposures on any accessible roof-level walking/working surface** related to proposed equipment in the area that exceed the FCC's **general population** exposure limits at this site. Any of the modeled exposure areas exceeding the **general population** limits need to follow the mitigation/compliance plan proposed in the report in order to bring the T-Mobile antennas to compliance. As such, the proposed T-Mobile project is in compliance with FCC rules and regulations. **Posting of the signages and the recommendations** presented in Appendix A **brings the site into compliance with FCC rules and regulations**.

Recalibrated Predictive Modeling Utilizing Field Measurements on Roof Level (General Population)		
Existing Configuration	Max Predictive %MPE	2623.300%
	Max Measured %MPE	97.200%
	dB Margin, Actual Maximum	14.312
Proposed Configuration	Max Predictive %MPE	10065.000%
	Predictive %MPE, Calibrated Maximum (-14.312)	372.934%
	Predictive %MPE, Calibrated Adjusted (-3.5 dB)	4495.900%

In order to fully ensure and conclude the hypothesis drawn from the on-field EME study, T-Mobile is recommended to conduct another on-field EME study post construction and commissioning of the proposed antenna configuration and technologies in order to be certain that the new antennas meet the compliance requirements of FCC's General Population limits. If at all the results exceed the exposure limits, T-Mobile shall take the necessary on-site mitigation plan to bring all the transmitting antennas into compliance.

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

Modeling indicates that there will be no accessible areas on the walking/working surfaces at the roof-level in front of the T-Mobile antennas that may exceed the FCC standards for general population and/or occupational exposure after implementation of mitigation measures. To reduce the risk of exposure and/or injury, GTA recommends that access to the **building** or areas associated with the active antenna installation or mitigation measures are restricted and secured where possible.

In order to alert any workers or general population potentially accessing the site, a blue Notice sign and/or yellow Caution sign and/or orange Warning sign based on the simulated exposure limits along with a yellow Guidelines sign are recommended for installation at the access to the rooftop/structure along with the barriers/stripping to exclude the RF radiations exceeding areas per the applicable limits.

12.0 Certification

This report has been prepared under the direction of the following Registered Professional Engineer:

I **Michael A. McGuire PE**, on the date indicated near my seal below hereby certify that:

I am registered as a Professional Engineer with License number listed below and that I am thoroughly familiar with the Regulations of the Federal Communication Commission (FCC), both in general and specifically as they apply to FCC guidelines for human exposure to Radiofrequency electromagnetic radiation and the EME predictive analysis for site identified as **SF72032M** located at **2045 Novato Boulevard Novato, CA 94947**, has performed on **July 5, 2024** in order to determine where there might be electromagnetic energy that is in excess of both the Controlled Environment and Uncontrolled Environment levels; and that I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge.

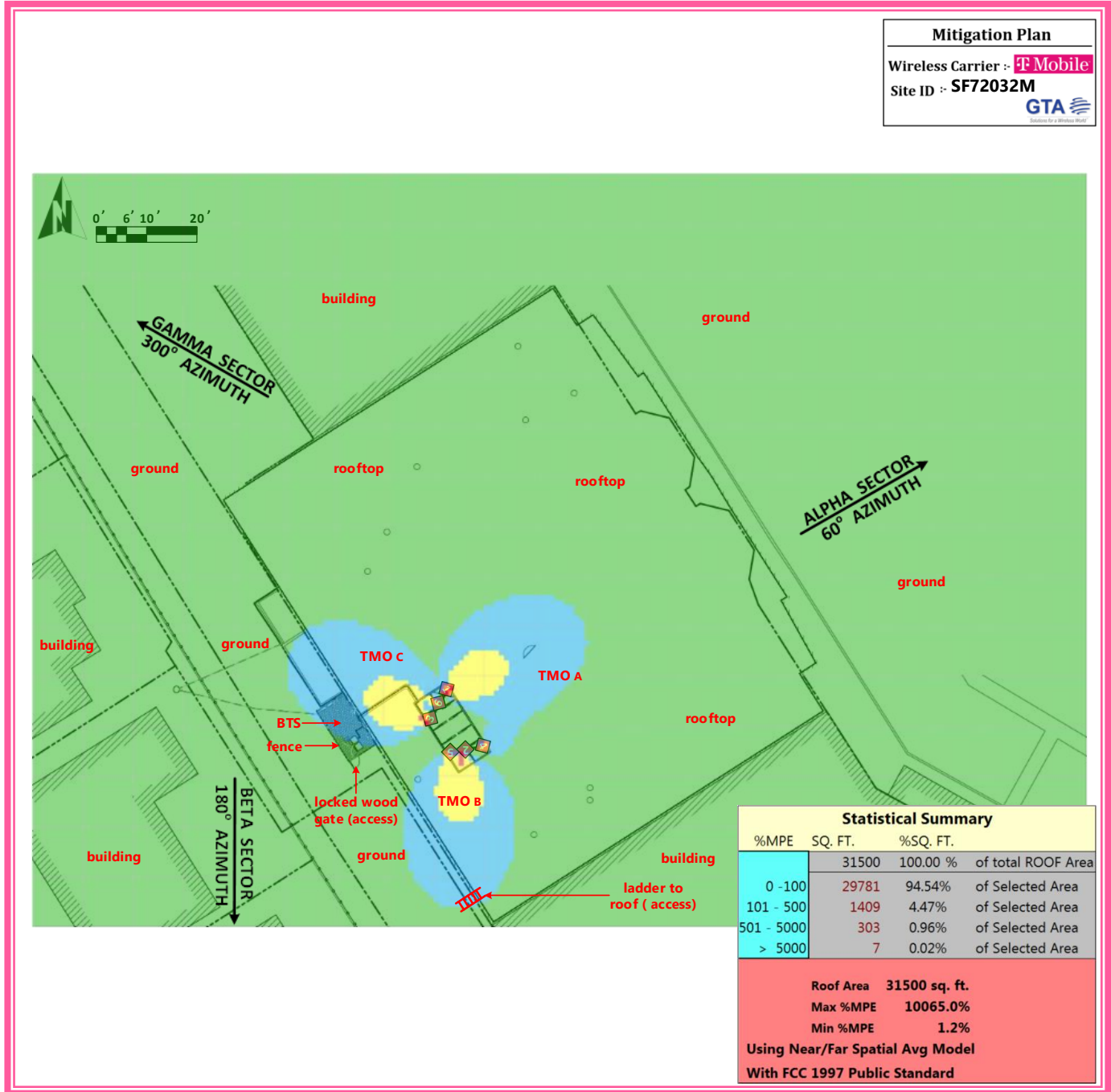


sealed 9jul2024

APPENDIX A

RoofView[®] Export File & Area Plot When Applicable/Pertinent

Predictive T-Mobile's RF contribution at nearest walking roof level from building for the general population standard



T-Mobile Antennas

Striping

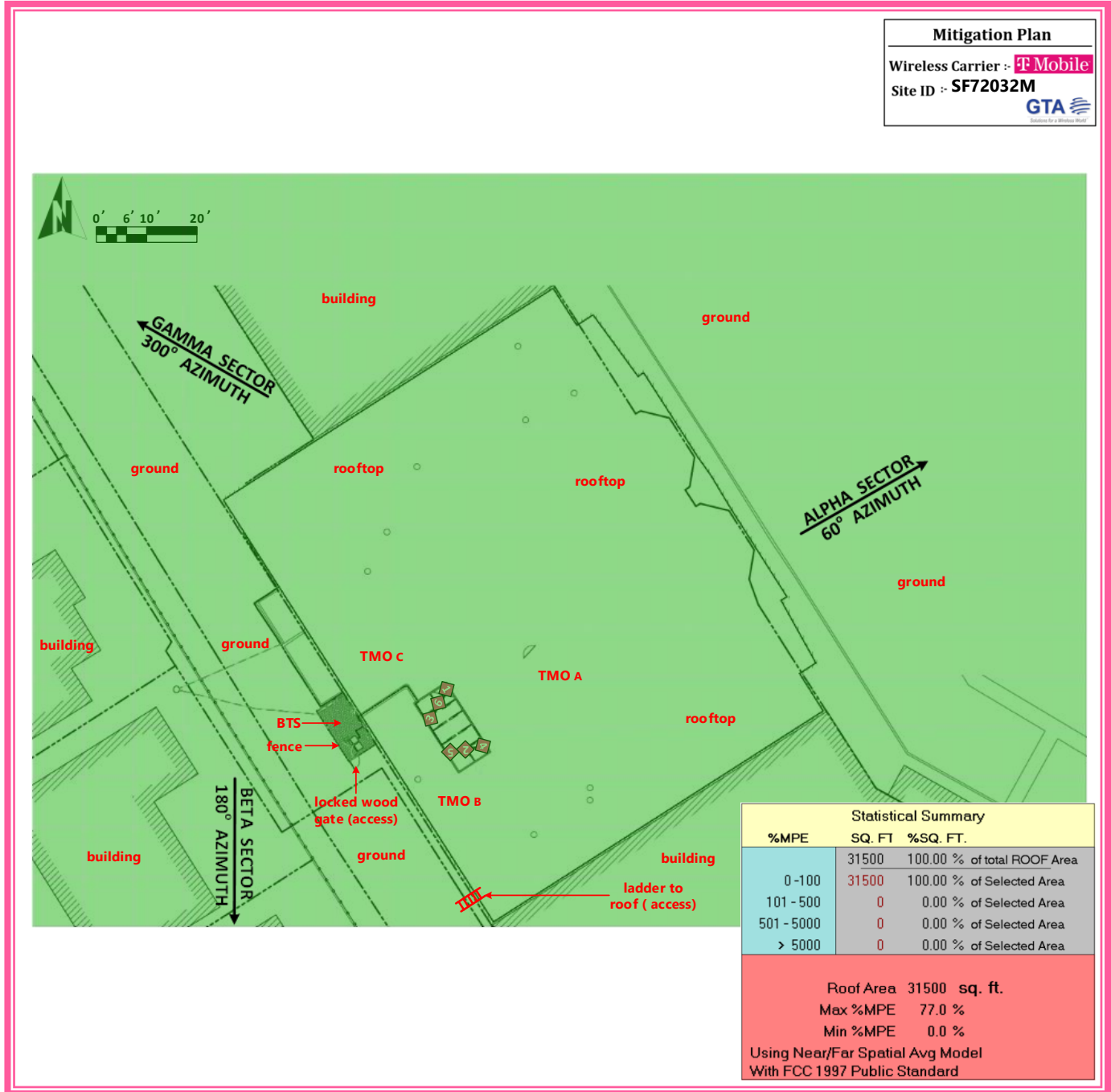
Physical Measurement

ENTRY Important Notes

Standard uses 'FCC exposure limits of 5.0 mW/cm2 for occupational and 1.0 mW/cm2 for general population'

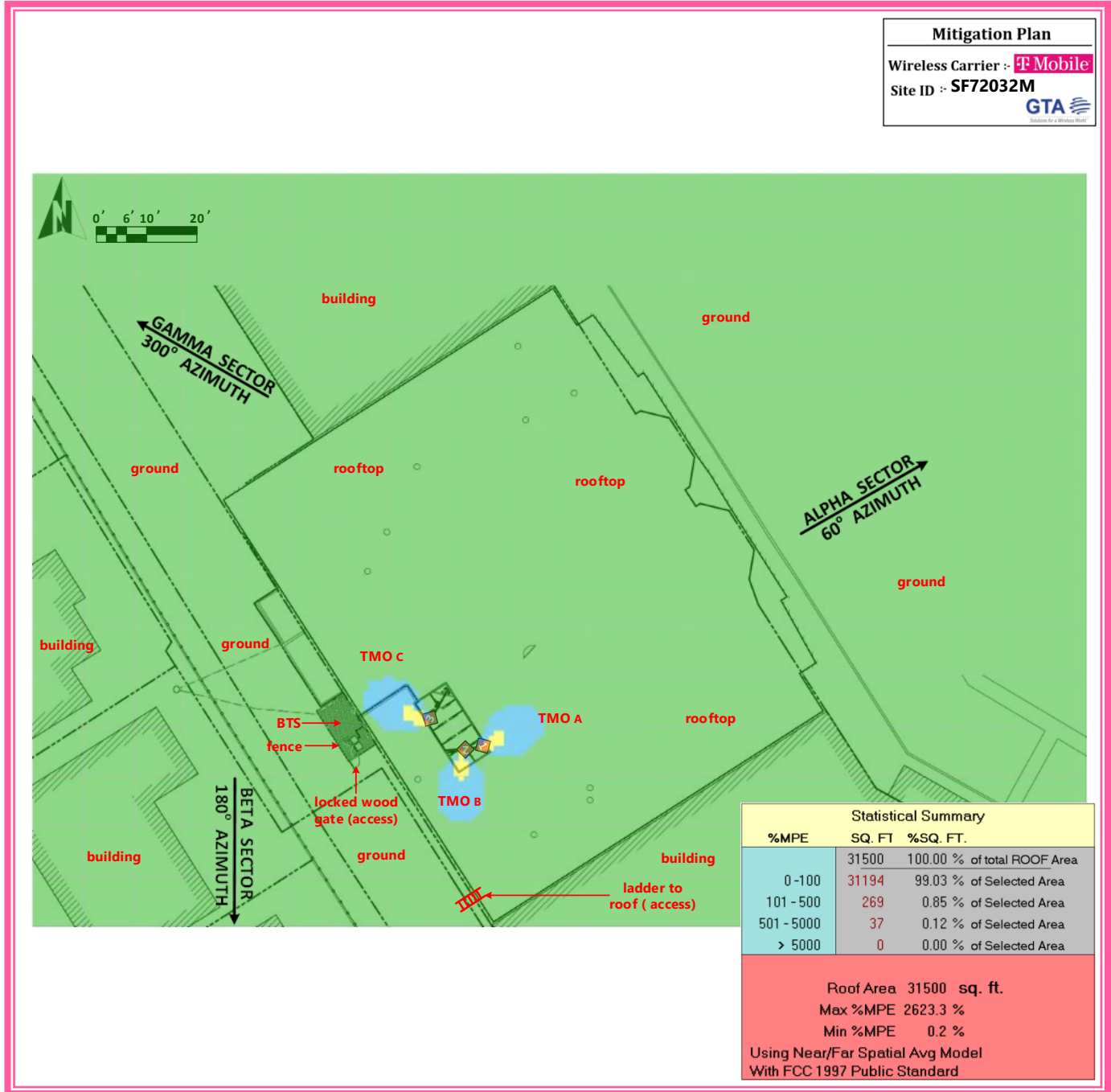
	0 - 100 %
	100 - 500 %
	500 - 5000 %
	Above 5000 %

Predictive T-Mobile's RF contribution at ground level for the general population standard



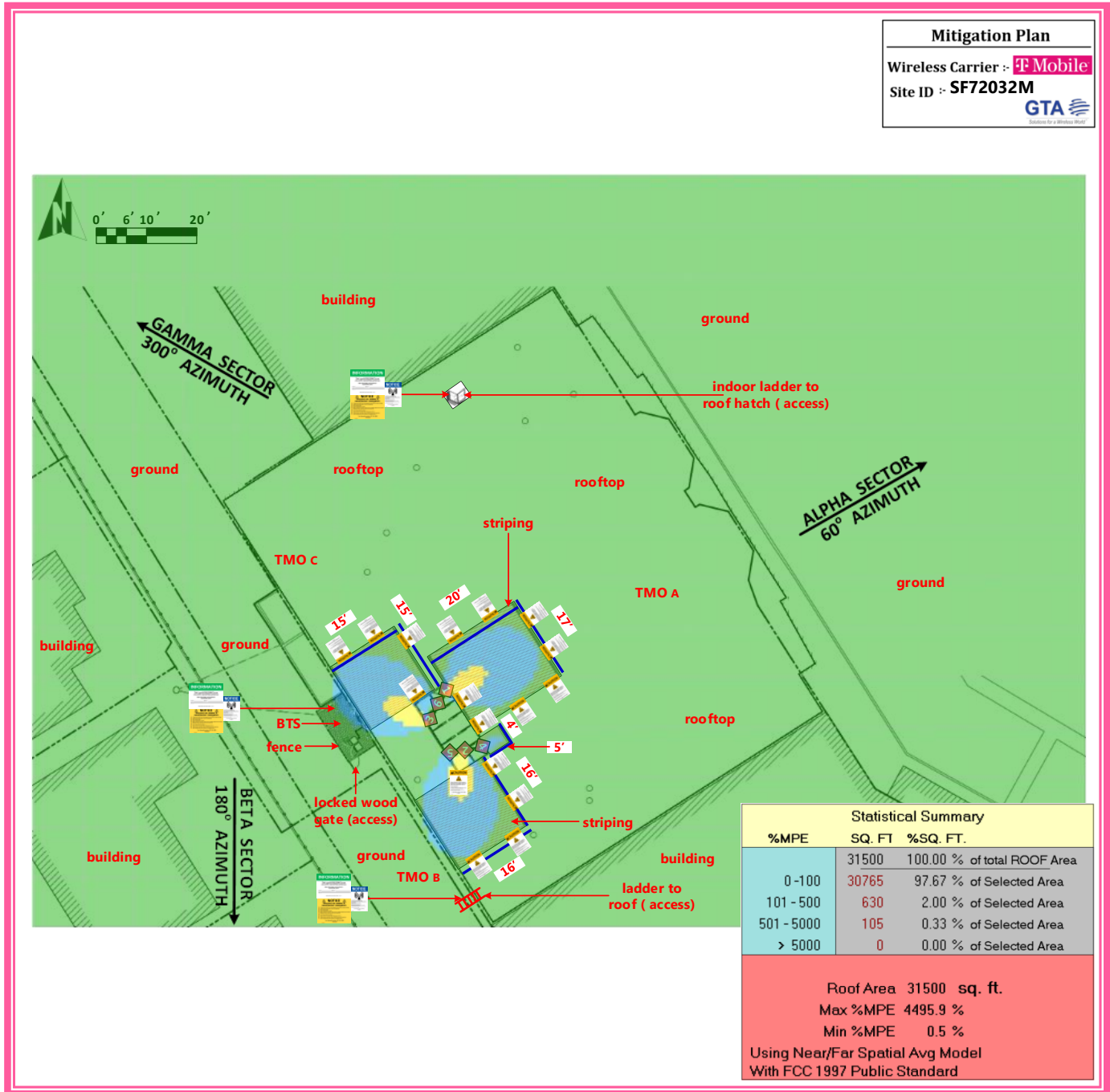
<p> T-Mobile Antennas</p> <p> Striping</p> <p> Physical Measurement</p> <p>ENTRY Important Notes</p> <p style="font-size: small;">Standard uses 'FCC exposure limits of 5.0 mW/cm2 for occupational and 1.0 mW/cm2 for general population'</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td>GUIDELINES</td> <td>NOTICE</td> <td>CAUTION</td> <td>WARNING</td> <td>NOC INFO</td> </tr> </table>						GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td>0 - 100 %</td> </tr> <tr> <td></td> <td>100 - 500 %</td> </tr> <tr> <td></td> <td>500 - 5000 %</td> </tr> <tr> <td></td> <td>Above 5000 %</td> </tr> </table>		0 - 100 %		100 - 500 %		500 - 5000 %		Above 5000 %
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Existing Predictive T-Mobile's RF contribution at nearest walking roof level from building for the general population standard



<p> T-Mobile Antennas</p> <p> Striping</p> <p> Physical Measurement</p> <p>ENTRY Important Notes</p> <p style="font-size: small;">Standard uses 'FCC exposure limits of 5.0 mW/cm2 for occupational and 1.0 mW/cm2 for general population'</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td style="text-align: center;">GUIDELINES</td> <td style="text-align: center;">NOTICE</td> <td style="text-align: center;">CAUTION</td> <td style="text-align: center;">WARNING</td> <td style="text-align: center;">NOC INFO</td> </tr> </table>						GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; background-color: #90EE90;"></td> <td style="text-align: center;">0 - 100 %</td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: #ADD8E6;"></td> <td style="text-align: center;">100 - 500 %</td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: #FFFF00;"></td> <td style="text-align: center;">500 - 5000 %</td> </tr> <tr> <td style="width: 20px; height: 20px; background-color: #FF0000;"></td> <td style="text-align: center;">Above 5000 %</td> </tr> </table>		0 - 100 %		100 - 500 %		500 - 5000 %		Above 5000 %
GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO																
	0 - 100 %																			
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	500 - 5000 %																			
	Above 5000 %																			

Recalibrated Predictive T-Mobile's RF contribution at nearest walking roof level from building for the general population standard



T-Mobile Antennas

Striping

Physical Measurement

ENTRY Important Notes

Standard uses 'FCC exposure limits of 5.0 mW/cm2 for occupational and 1.0 mW/cm2 for general population'

	0 - 100 %
	100 - 500 %
	500 - 5000 %
	Above 5000 %

APPENDIX B

Statement of Limiting Conditions

Statement of Limiting Conditions

GTA has run MPE predictive analysis with regards to the RF environment. For MPE Predictive analysis, GTA considered the accessible areas of the site to determine approximate field strength levels and to identify any areas with higher levels exceeding FCC MPE GPL limits and then determined spatially averaged field levels in areas with highest fields and documented in report. GTA will not be responsible for matters of a legal nature that affect the site of property.

Due to the complexity of some wireless sites, GTA performed this analysis and created this report utilizing best industry practices and due diligence. GTA cannot be held accountable of responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by T-Mobile, the site manager, or their affiliates, subcontractors or assigns.

GTA 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 GTA's recommendations.

GTA may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the analysis of the subject property or that vendor became aware of during the normal research involved in performing this predictive study. GTA 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 GTA 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. The RF MPE is valid and accurate for RF Emitters data provided by T-Mobile at the time predictive study analysis. GTA does not take any responsibility for FCC compliance of the site if the radio conditions have changed after that time.

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

APPENDIX C

Rules & Regulations

Explanation of Applicable Rules And Regulations

FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Currently, there are two different levels of MPE – General population MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General population is defined as anyone who does not meet the conditions of being Occupational. FCC Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations.

A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the general population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- are exposed to RF energy as a consequence of their employment;
- have been made aware of the possibility of exposure; and
- can exercise control over their exposure.

FCC guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General population. Compliance is also maintained when any non-occupational individuals (the General population) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

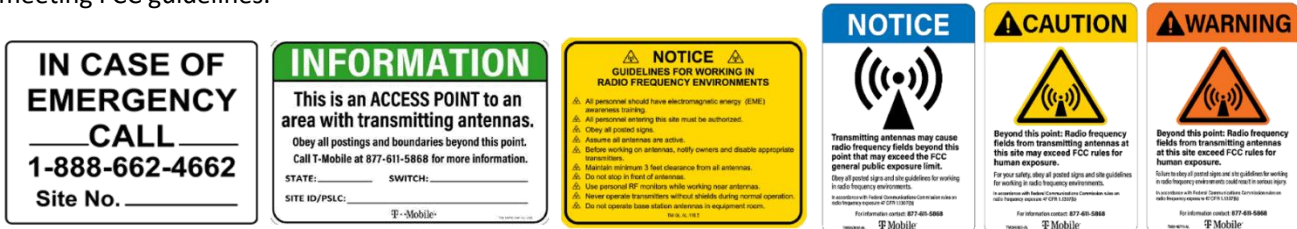
APPENDIX D

General Safety Recommendations

Site ID: SF72032M

The following are general recommendations appropriate for any site with accessible areas in excess of 100% General population MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.
2. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:
 - adding new antennas that may have been located on the site.
 - removing of any existing antennas
 - changes in the radiating power or number of RF emitters
3. Post the appropriate NOTICE, CAUTION & WARNING sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure diagrams, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are example of signs meeting FCC guidelines.



4. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general population if deemed as policy by the building/site owner.
5. For a General population environment, the three-color levels identified in measured RF emission diagram can be interpreted in the following manner:
 - Green represents areas predicted to be greater than or equal to 0% and less than 100% of the MPE general population limits. The General population can access these areas with no restrictions.
 - Blue represents areas predicted to be greater than or equal to 100% and lesser than 500% of the MPE General population limits. The General population should be restricted from accessing these areas.
 - Yellow represents areas predicted to be greater than or equal to 500% and less than 5000% of the MPE general population limits. The General population should be restricted from accessing these areas as it can cause serious injuries.
 - Red represents areas predicted to be greater than or equal to 5000% of the MPE general population limits. The General population should be restricted from accessing these areas as it can cause serious injuries.
6. For an Occupational environment, the three-color levels identified in a measured RF emission diagram can be interpreted in the following manner:
 - Green represents areas predicted to be greater than or equal to 0% and less than 100% of the MPE occupational limits. Workers can access these areas with no restrictions.
 - Blue represents areas predicted to be greater than or equal to 100% and less than 500% of the MPE occupational limits. Access is restricted for workers. Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and can exercise control over their exposure.
 - Yellow represents areas predicted to be greater than or equal to 500% and less than 5000% of the MPE occupational limits. Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and can exercise control over their exposure. Special procedures may be required such as transmitter power reduction to minimize workers exposure to EME as it can cause serious injuries near and on contact.
 - Red represents areas predicted to be greater than or equal to 5000% of the MPE occupational limits. Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and can exercise control over their exposure. Special procedures may be required such as transmitter power reduction to minimize workers exposure to EME as it can cause serious injuries near and on contact.

APPENDIX E

References

Site Safety 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 operator 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 of 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 locations (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 telecommunication 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.

RF Emissions Diagram:

Section 7 of this report contains an RF Emissions Diagram that outlines various theoretical MPE/EME simulations and assumes a duty cycle of 75% for each transmitting antenna at full power. This analysis is a worst-case scenario. This analysis is based on one of two access control criteria: General population criteria means that the access to the site is uncontrolled and anyone can gain access. Occupational criteria means that the access is restricted and only properly trained individuals can gain access to the antenna locations.

Site ID: SF72032M

Additional Information

Additional RF information is available at the following sites:

<https://www.fcc.gov/general/radio-frequency-safety-0>

<https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety>

OSHA has additional information available at:

<https://www.osha.gov/SLTC/radiofrequencyradiation/index.html>

APPENDIX F

Proprietary Statement

Site ID: SF72032M

This report was prepared for the use of T-Mobile to meet requirements specified in T-Mobile's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under same/similar circumstances. The conclusions provided by GTA, are based solely on the information provided by T-Mobile and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to GTA, so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions of Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made. For any report or site specific questions, please contact Compliance Manager at mpe@gtatelecom.com or (703)-476-8999.