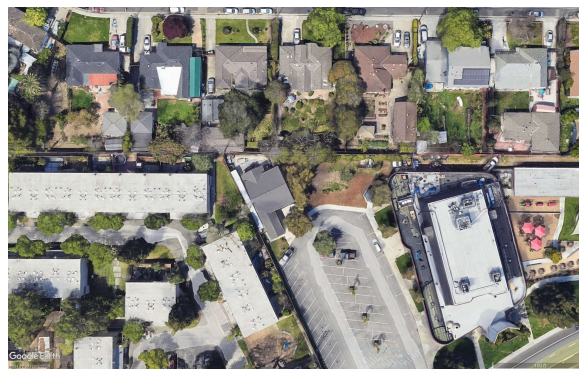


Radio Frequency – Electromagnetic Energy (RF-EME) Compliance Report

Prepared For AT&T Mobility, LLC

Site name:	CCL06126
FA#:	15376635
USID:	298767
Site ID:	CCL06126
EBI Project Number	027543-PR
Address:	3111 Benton Street, Santa Clara, California
County:	Santa Clara
Latitude:	37.34685833
Longitude:	-121.98483889
Structure Type:	Roof
Ordered by:	Complete Wireless
Pace Job:	MRSFR073883/ MRSFR083099/ MRSFR083010/ MRSFR083093/ MRSFR083975
RFDS ID:	
Report Writer:	Rebecca Sinisgalli
Report Date:	5 September 2024



Statement of Compliance

AT&T Mobility Compliance Statement: Based on the information collected, AT&T Mobility will be Compliant with FCC Rules and Regulations at the nearest walking surface if recommendations in the Compliance Summary are implemented.

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1. Executive summary

Purpose of Report

EBI Consulting has been contracted by AT&T Mobility, LLC to provide a Radio Frequency Electromagnetic Energy (RF-EME) compliance analysis and report for the above listed AT&T base station facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations to determine RF-EME exposure levels from proposed AT&T wireless communications equipment at this site. The Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public 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.

This report contains the RF EME analysis for the site, including the following:

- Site Plan with antenna locations
- Graphical representation of recommended signage and/or barriers

This document addresses the compliance of AT&T's transmitting facilities independently and in relation to all collocated facilities at the site.

Table 1: Compliance status	
Max Predictive Spatial Average MPE% at Ground Level (General Public):	49.33%
AT&T Mobility Site Compliance:	AT&T Mobility Compliance Statement: Based on the information collected, AT&T Mobility will be Compliant with FCC Rules and Regulations at the nearest walking surface if recommendations in the Compliance Summary are implemented.

Table 2: Documents used to prepare this report	
Construction Drawings	100_ZD_12-5-23_15376635_298767_CCL06126_CV_DM_RF
RFDS	PRELIM_RFDS_12_06_2023_CCL06126

2. Predicted Emissions

This section details predicted RF emissions levels present on any on-site applicable walking/working surfaces identified as well as applicable off-site areas, such as ground level or other points of interest, such as adjacent buildings. Results are provided as a percentage of the FCC OET 65 standard (unless otherwise specified).

EBI has conducted theoretical modeling to estimate the worst-case power density from AT&T antennas and other carrier antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC requirements, as well as AT&T's corporate RF safety policies.

The assumptions used and inputs modelled are based upon information provided by AT&T and information gathered from other sources. T-Mobile, Verizon, and Dish were observed to have antennas on the adjacent rooftop.

Information about the RF Compliance software and calculation methodology used are detailed in Appendix E: RF Compliance Simulation Software. Scale maps are included in highlighting mitigation strategies deployed or proposed to ensure EMF compliance, where applicable, as shown in Section 0: .

3. Mitigation Recommendations

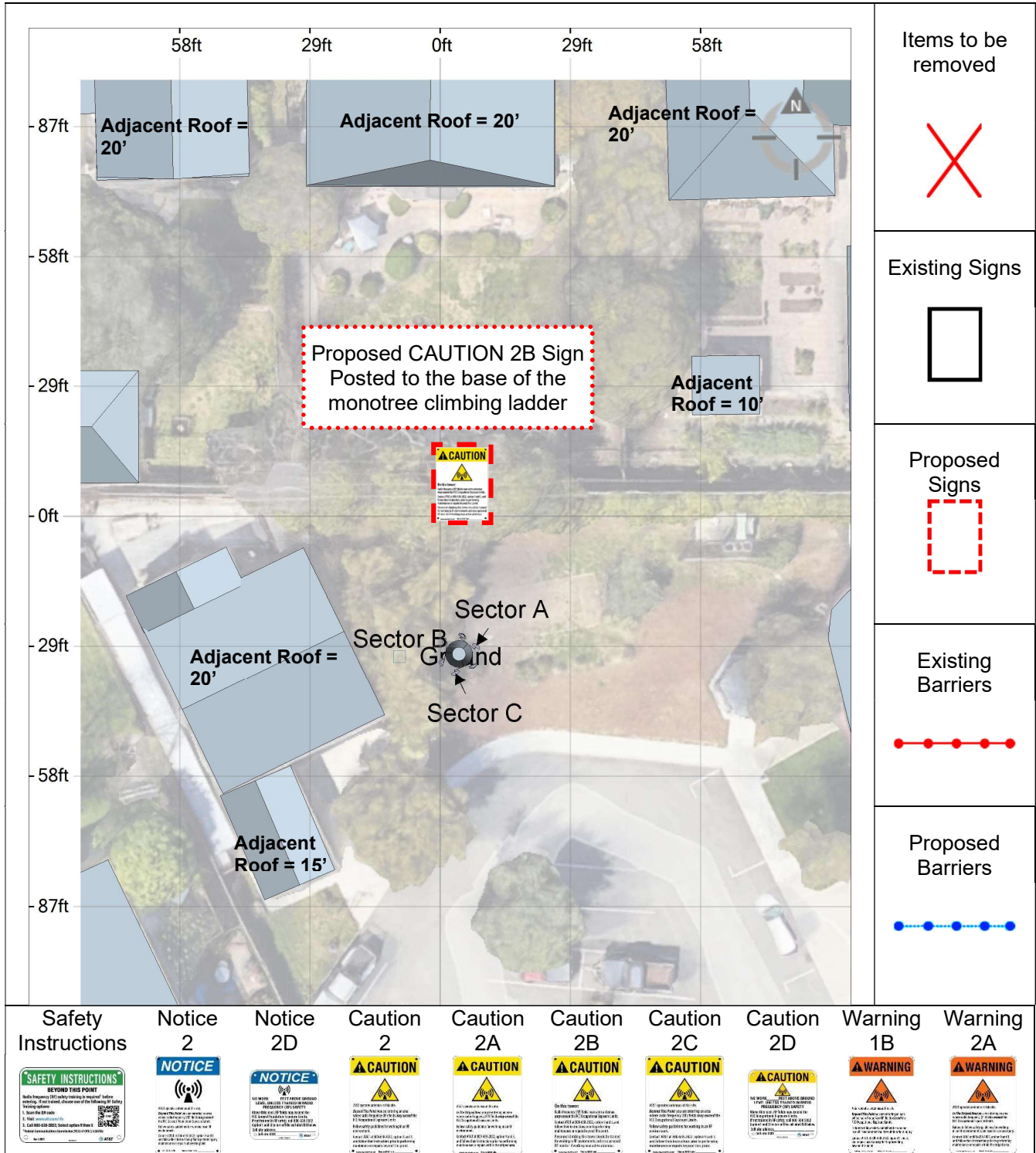
To reduce the risk of exposure and/or injury, EBI recommends that access to the rooftop or areas associated with the active antenna installation be restricted and secured where possible. Signage is recommended as presented below. Posting of the signage and installation of the recommended barriers brings the site into compliance with FCC rules and regulations and AT&T's corporate RF safety policies. Workers or members of the general public accessing areas directly in front of the other carrier antennas should contact the carrier and/or landlord to determine appropriate setbacks or measures to safely occupy those areas.

Table 5: Recommended Mitigation		
Location	Proposed Signage	Proposed Barrier(s)
Access	<ul style="list-style-type: none"> ▪ Yellow CAUTION 2B sign posted to the base of the monotree climbing ladder. 	None
Alpha Sector	<ul style="list-style-type: none"> ▪ No action required. 	None
Beta Sector	<ul style="list-style-type: none"> ▪ No action required. 	None
Gamma Sector	<ul style="list-style-type: none"> ▪ No action required. 	None

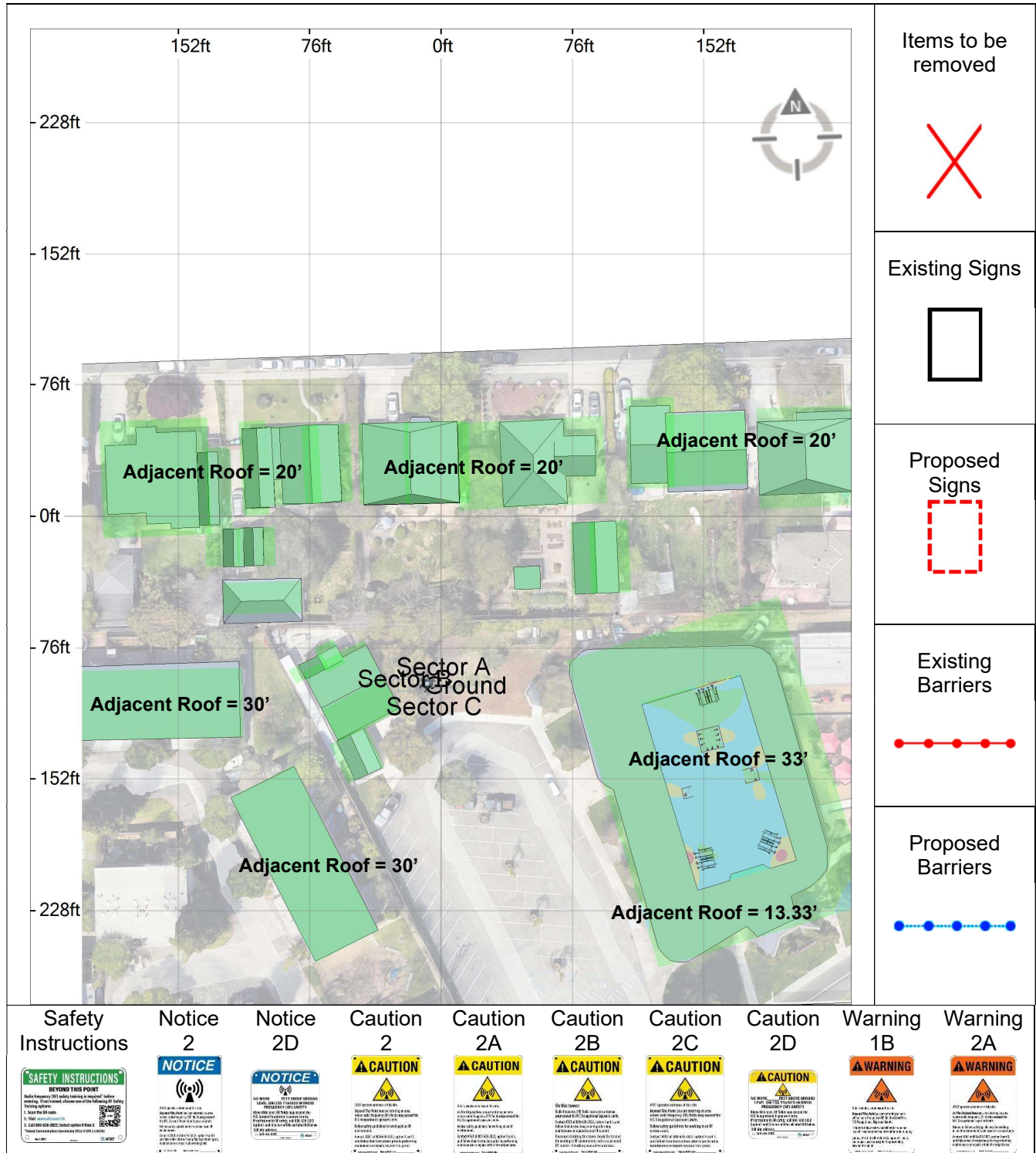
Barriers should be constructed of weather-resistant plastic or wood fencing. Barriers may consist of railing, rope, chain, or weather-resistant plastic if no other types are permitted or are feasible. Painted stripes should only be used as a last resort and only in regions where there is little chance of snowfall. If painted stripes are selected as barriers, it is recommended that the stripes and signage be illuminated. The signage and any barriers are graphically represented in the Signage Plan presented below. It is important to note that this Signage Plan is specific for AT&T antennas only and does not address RF emissions of other carrier antennas.

All workers and individuals accessing the monotree or persons (including arborists), accessing elevated structures or trees within areas exceeding the general public MPE, must be made aware of the presence and locations of antennas and their associated fields, where applicable.

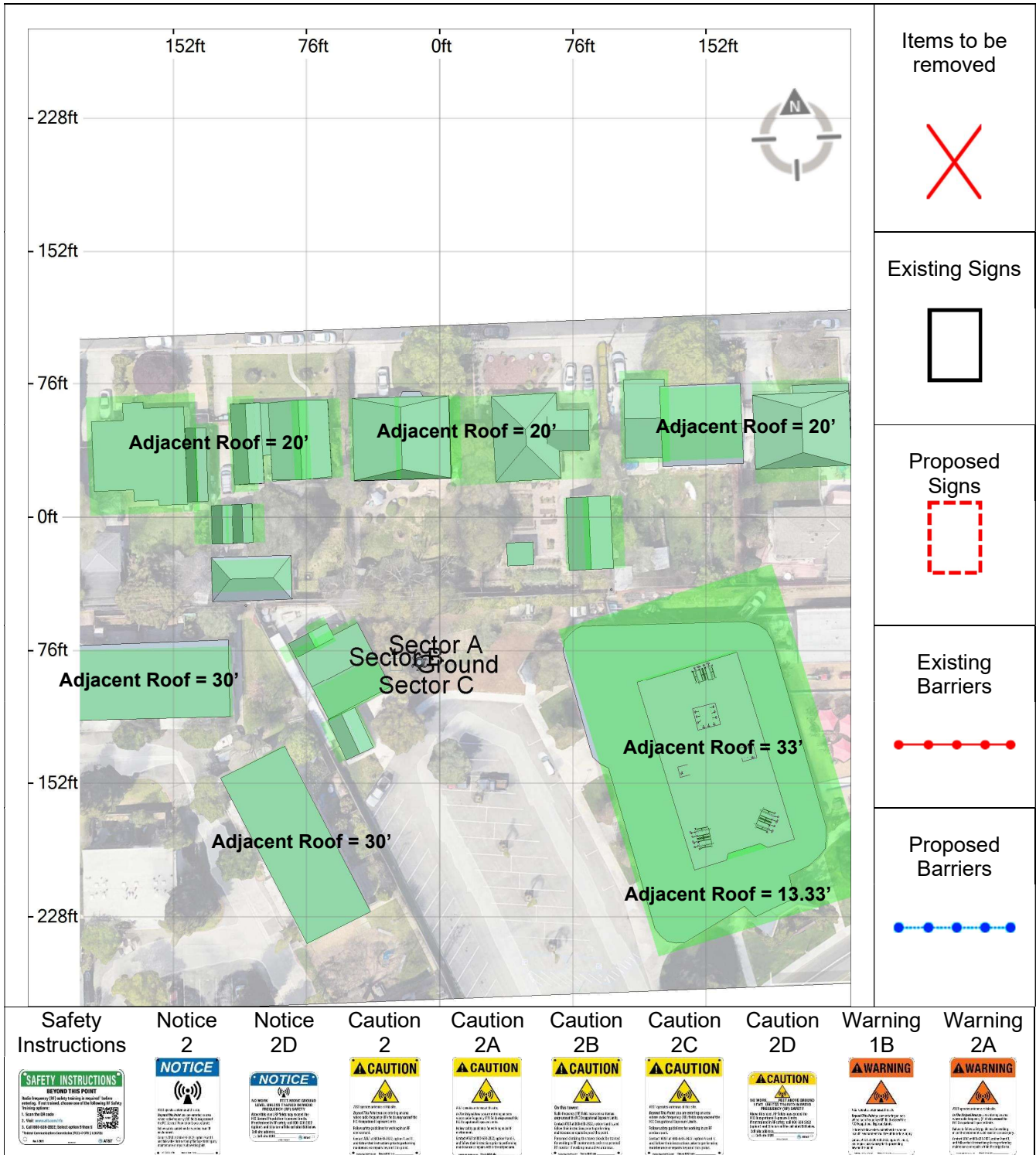
Mitigation Overview



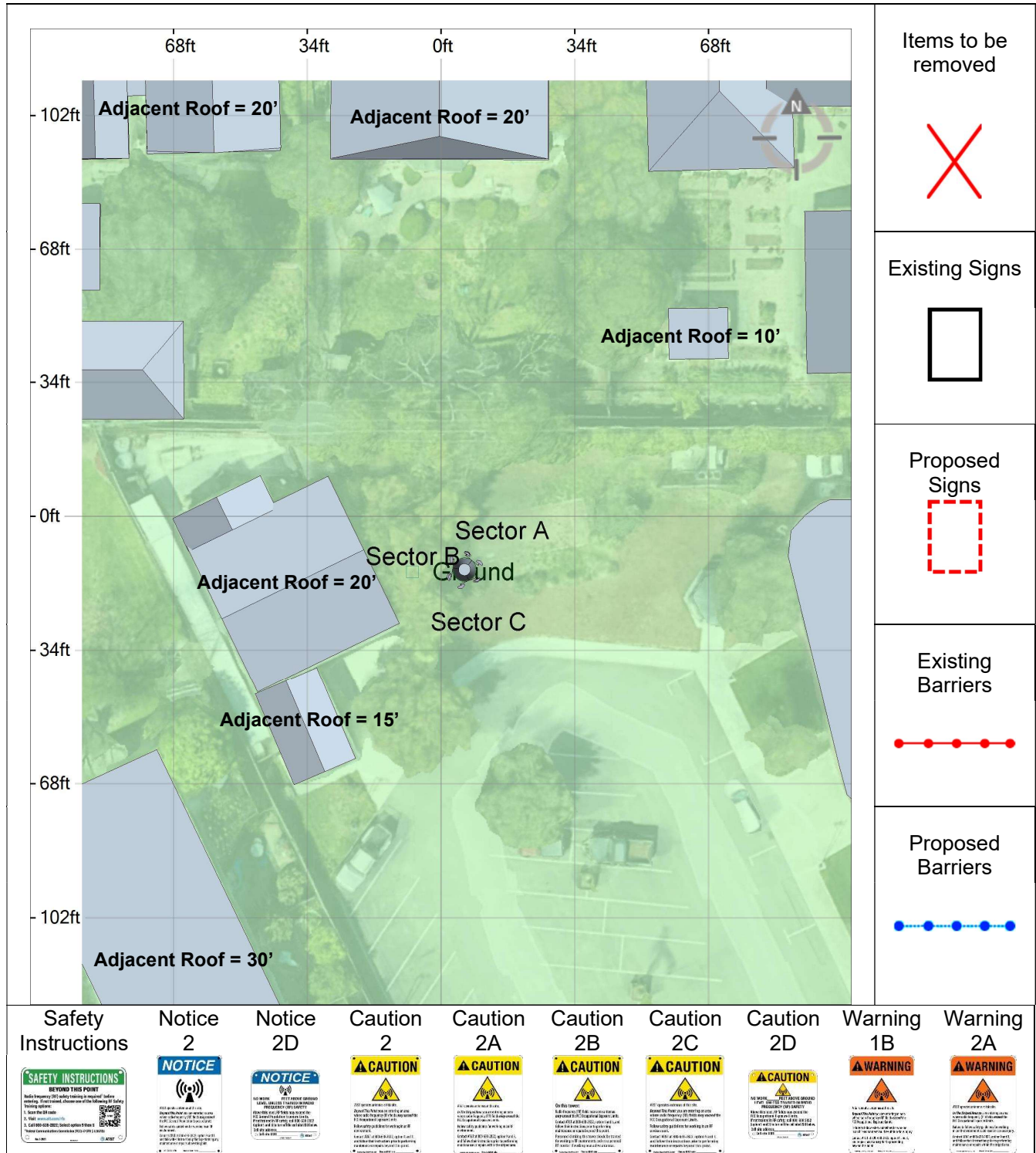
Exposure Threshold - Adjacent Roofs All Carriers



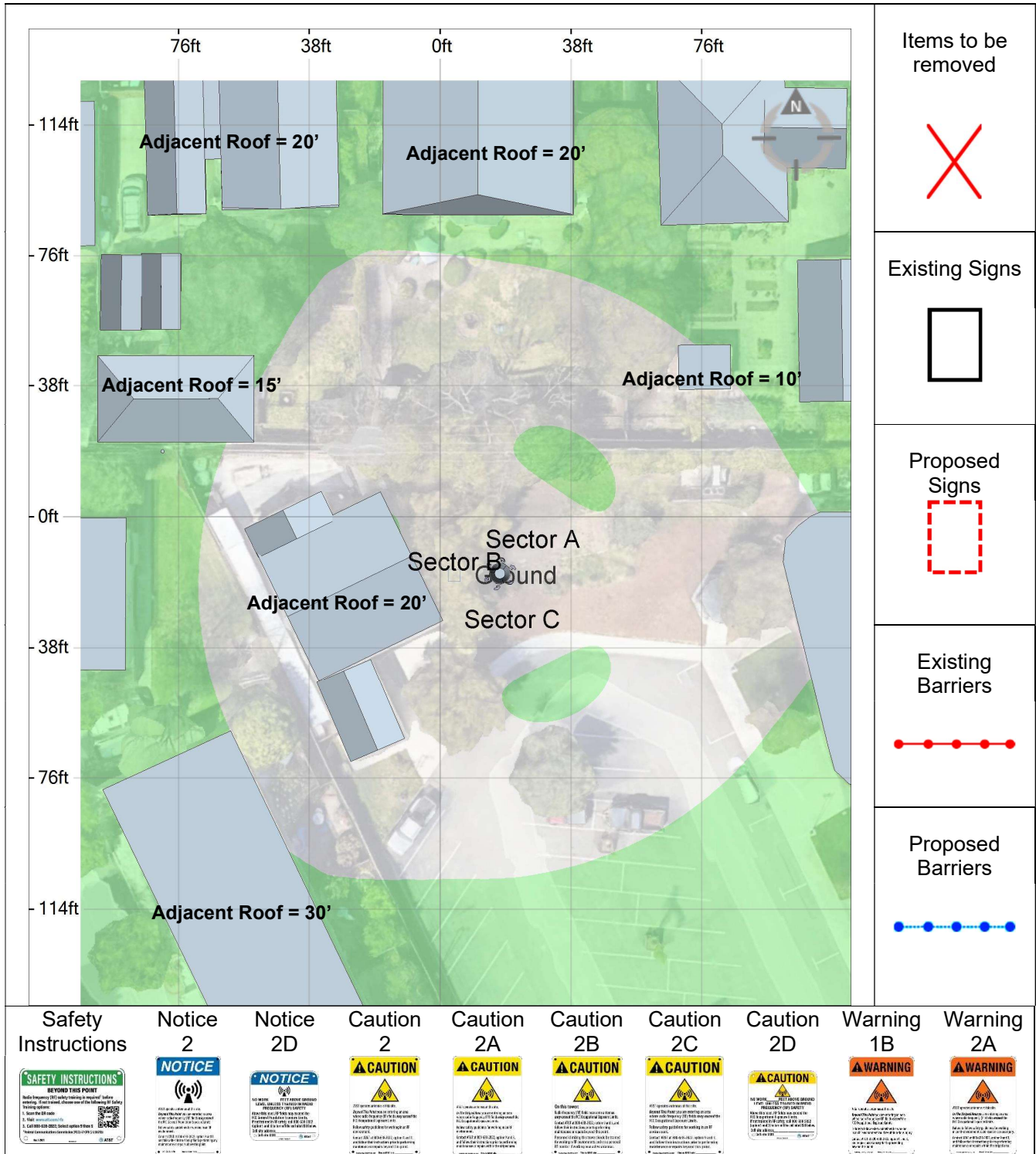
Exposure Threshold - Adjacent Roof AT&T Only



Exposure Threshold - Ground All Carriers



Exposure Threshold - Ground AT&T Only



4. Limitations

This report was prepared for the use of AT&T Mobility, LLC to meet requirements outlined in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of the trade, albeit proprietary in specific content, including other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI and its partners are based solely on information supplied by AT&T, including modeling instructions, inputs, parameters and methods. Calculations, data, and modeling methodologies for C Band equipment include a statistical factor reducing the power to 32% of maximum theoretical power to account for spatial distribution of users, network utilization, time division duplexing, and scheduling time. AT&T recommends the use of this factor based on a combination of guidance from its antenna system manufacturers, supporting international industry standards, industry publications, and its extensive experience. 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 EBI 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.

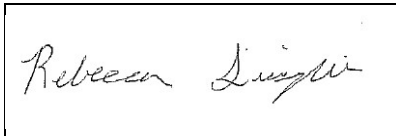
5. Appendices

Appendix A: Certifications

Report Preparer Certification

I, Rebecca Sinisgalli, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified “occupational” under the FCC regulations.
- I am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation.
- I have been trained in on the procedures outlined in AT&T’s RF Exposure: Responsibilities, Procedures & Guidelines document (dated October 28, 2014) and on RF-EME modelling using IXUS™ modelling software.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



Reviewed and Approved by:



sealed 06sep2024

Michael McGuire
Electrical Engineer
mike@h2dc.com

Note that EBI's scope of work is limited to an evaluation of the Radio Frequency – Electromagnetic Energy (RF-EME) field generated by the antennas and broadcast equipment noted in this report. The engineering and design of the building and related structures, as well as the impact of the antennas and broadcast equipment on the structural integrity of the building, are specifically excluded from EBI's scope of work.

Appendix B: RF Exposure Policy Requirements

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated May 27, 2015, requires that:

1. All sites must be analyzed for RF exposure compliance;
2. All sites must have that analysis documented; and
3. All sites must have any necessary signage and barriers installed.

Appendix C: AT&T Signage and Mitigation

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. As presented in the AT&T guidance document, the signs must:

- Be posted at a conspicuous point;
- Be posted at the appropriate locations;
- Be readily visible; and
- Make the reader aware of the potential risks prior to entering the affected area.

The table below presents the signs that may be used for AT&T installations.

CRAN / HETNET Small Cell Decals / Signs		Alerting Signs	
	STONEHOUSE NOTICE DECAL		
	STONEHOUSE NOTICE SIGN		
	STONEHOUSE CAUTION DECAL		
	STONEHOUSE CAUTION SIGN		

Appendix D: Federal Communications Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency 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 public/uncontrolled exposure limits for members of the general public.

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

Table 1 and Figure 1 (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.

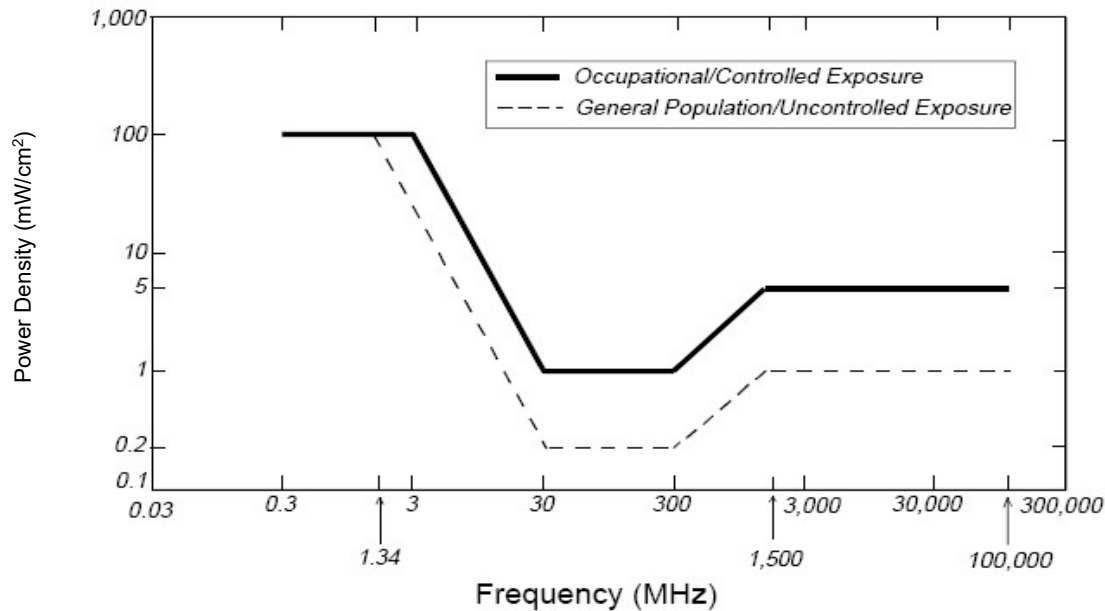
The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm²). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm²) and an uncontrolled MPE of 1 mW/cm² for equipment operating in the 1900 MHz frequency range. For the AT&T equipment operating at 700 MHz, the FCC's occupational MPE limit is 2.33 mW/cm² and an uncontrolled MPE limit of 0.47 mW/cm². For the AT&T equipment operating at 1900 MHz, the FCC's occupational MPE is 5.0 mW/cm² and an uncontrolled MPE limit of 1.0 mW/cm². These limits are considered protective of these populations.

Table 1: Limits for Maximum Permissible Exposure (MPE)

(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	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
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/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	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
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)
 * Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)
 Plane-wave Equivalent Power Density



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
Microwave (Point-to-Point)	5,000 - 80,000 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Broadband Radio (BRS)	2,600 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Wireless Communication (WCS)	2,300 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Advanced Wireless (AWS)	2,100 MHz	5.00 mW/cm ²	1.00 mW/cm ²
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 (SMR)	855 MHz	2.85 mW/cm ²	0.57 mW/cm ²
Long Term Evolution (LTE)	700 MHz	2.33 mW/cm ²	0.47 mW/cm ²
Most Restrictive Frequency Range	30-300 MHz	1.00 mW/cm ²	0.20 mW/cm ²

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication (PCS) facilities used by AT&T in this area operate within a frequency range of 700-1900 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.

FCC Compliance Requirement

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.

Appendix E: RF Compliance Simulation Software

The IXUS electromagnetic field (EMF) calculation software was used to assess all the RF field levels presented in this study. IXUS (<https://ixusapp.com/>) is a software product of Alphawave Mobile Network Products (Pty) Ltd, who specialize in electromagnetic software and systems. The IXUS software uses a fast and accurate EMF calculation tool that allows for the determination of RF field strength in the vicinity of radio communication base stations and transmitters. At its core, the IXUS EMF calculation module implements field evaluation techniques detailed in the ITU-T K.61, CENELEC 50383, and IEC62232 specifications. The calculation of EMF results at any point in 3-D space is achieved by either a synthetic ray tracing technique, a conservative cylindrical envelope method, or through full-wave EM simulation results obtained from a computational electromagnetic software tool.

The selection of the solution method is determined by the specific antenna being considered. In addition, a conservative and verified modelling technique for 5G beamforming antennas in IXUS is used. The simulation accuracy of the IXUS calculation module has been verified extensively with full-wave EM simulations.

IXUS version number: 4.12 (0)2024.2.0 (Calculator: 2024.2).

Compliance exposure standard: FCC OET 65.