



YOUR RF SAFETY PARTNER

RADIO FREQUENCY ELECTROMAGNETIC FIELDS EXPOSURE REPORT

Prepared for Sprint

Site Name: Mission Gorge
Site ID: SD34XC567
Site Type: Rooftop

Located at:

**7811 Mission Gorge Rd
San Diego, CA 92120
Latitude: 32.8108 / Longitude: -117.0660**

**Report Date: 10/27/2015
Report By: Christopher Stollar**

Based on FCC Rules and Regulations, Sprint is compliant.

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1.0 EXECUTIVE SUMMARY

Dtech Communications, LLC (“Dtech”) has been retained by Sprint to determine whether its wireless communications facility complies with the Federal Communications Commission (“FCC”) Radio Frequency (“RF”) Safety Guidelines. This report contains a computer-simulated analysis of the Electromagnetic Fields (“EMF”) exposure resulting from the facility. The analysis also includes assessment of existing wireless carriers on site, where information is provided. The table below summarizes the result at a glance:

Table 1: EMF Summary

Category	Summary
Access Type	Hatch(s)
Access to antennas locked	Recommended
RF Sign(s) @ access point(s)	Green Information (optional)
RF Sign(s) @ antennas	Green Information (optional @ All Sectors)
Barrier(s) @ sectors	NA
Max EMF level for Sprint on Ground	2.6% General Population
Max EMF level for Sprint on Roof	719.9% General Population (144.0% Occupational) (away from roof deck)

2.0 SITE DESCRIPTION

The wireless telecommunication facility is located on a building rooftop. The facility consists of 1 wireless carrier(s) or operator(s): Sprint. The antennas are typically grouped into sectors pointing in different direction to achieve the desired areas of coverage. Sprint's antennas are facade-mounted on the building walls behind box screens and connected to the equipment via cables.

2.1 Site Map



2.2 Antenna Inventory

Technical specifications provided below are gathered from physical field surveys where possible, provided drawings and/or other documents provided by our clients, site/building managers and other licensees at this facility. "Generic", "Others", "Unknown" and conservative estimates are used where information is not available.

Table 2: Site Technical Specifications

Antenna ID	Operator	Antenna Mfg.	Antenna Model	Type	Frequency (MHz)	Orientation (°T)	Horizontal BWidth (°)	Antenna Aperture (ft)	Antenna Gain (dBd)	Radio/Channel Count	Total ERP (Watts)	Bottom Tip Height Above Ground (Z) (ft)	Bottom Tip Height Above Roof (Z) (ft)
A1	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	40	68	6	14.9	3	578.4	32.4	0.4
A2	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	40	60	6	14.9	3	1309.2	32.4	0.4
A3	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	40	68	6	14.9	3	578.4	32.4	0.4
A4	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	40	60	6	14.9	3	1309.2	32.4	0.4
B1	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	90	68	6	14.9	3	578.4	32.4	0.4
B2	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	90	60	6	14.9	3	1309.2	32.4	0.4
B3	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	90	68	6	14.9	3	578.4	32.4	0.4
B4	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	90	60	6	14.9	3	1309.2	32.4	0.4
C1	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	230	68	6	14.9	3	578.4	39.4	0.4
C2	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	230	60	6	14.9	3	1309.2	39.4	0.4
C3	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	230	68	6	14.9	3	578.4	39.4	0.4
C4	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	230	60	6	14.9	3	1309.2	39.4	0.4
D1	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	335	68	6	14.9	3	578.4	37.9	0.4
D2	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	335	60	6	14.9	3	1309.2	37.9	0.4
D3	Sprint	Commscope	DHHTT65B-3XR	Panel	1900	335	68	6	14.9	3	578.4	37.9	0.4
D4	Sprint	Commscope	DHHTT65B-3XR	Panel	2500	335	60	6	14.9	3	1309.2	37.9	0.4

3.0 ANALYSIS

3.1 Emission Predictions

Figure 1: Plan (bird's eye) view map of results compared to FCC's General Population MPE (Maximum Permissible Exposure) Limits. Gray represents areas where exposure levels are calculated to be at or below 5%; Green- between 5% & 100% (below MPE limits); blue, yellow & red – greater than 100% (exceeds MPE limits).

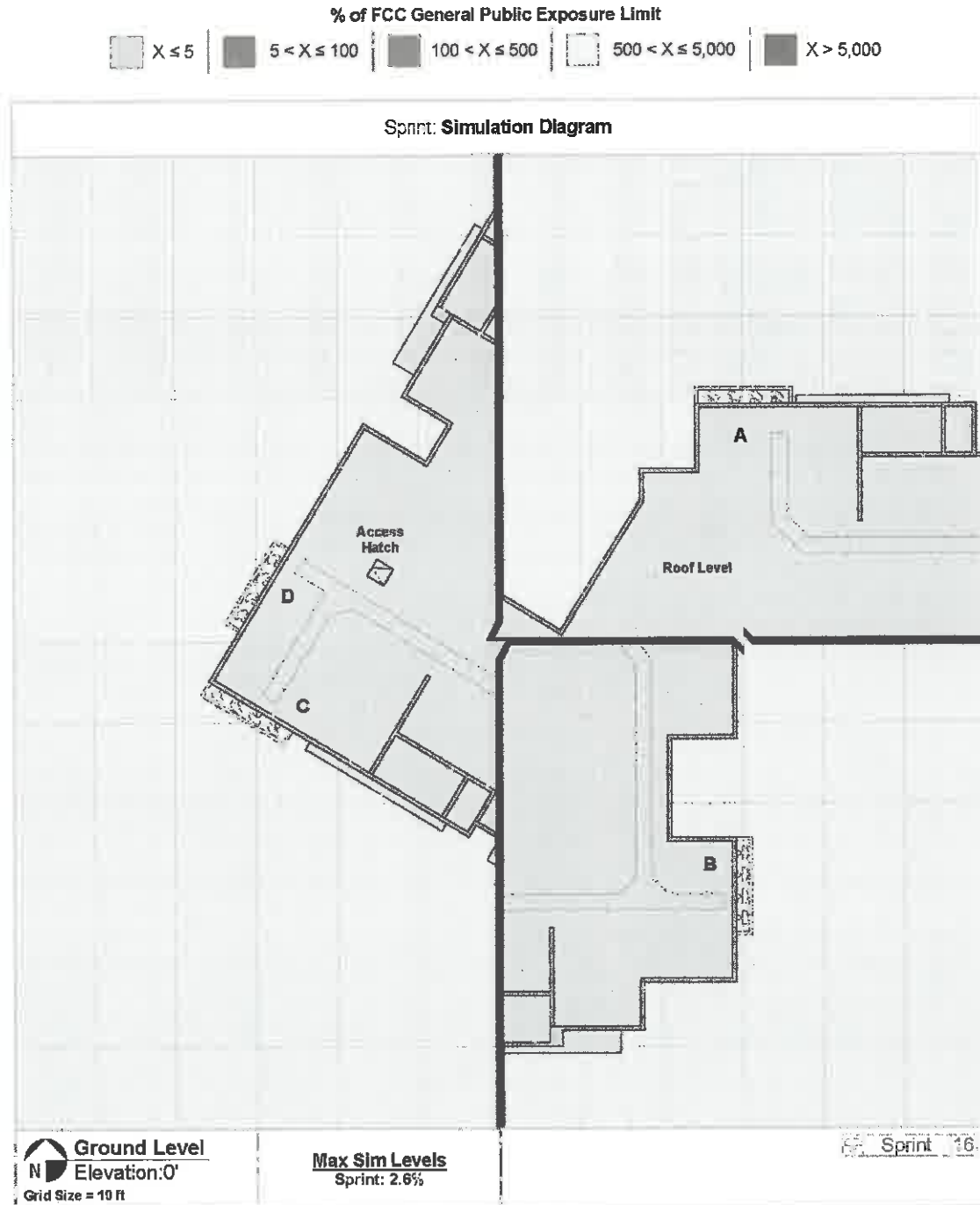
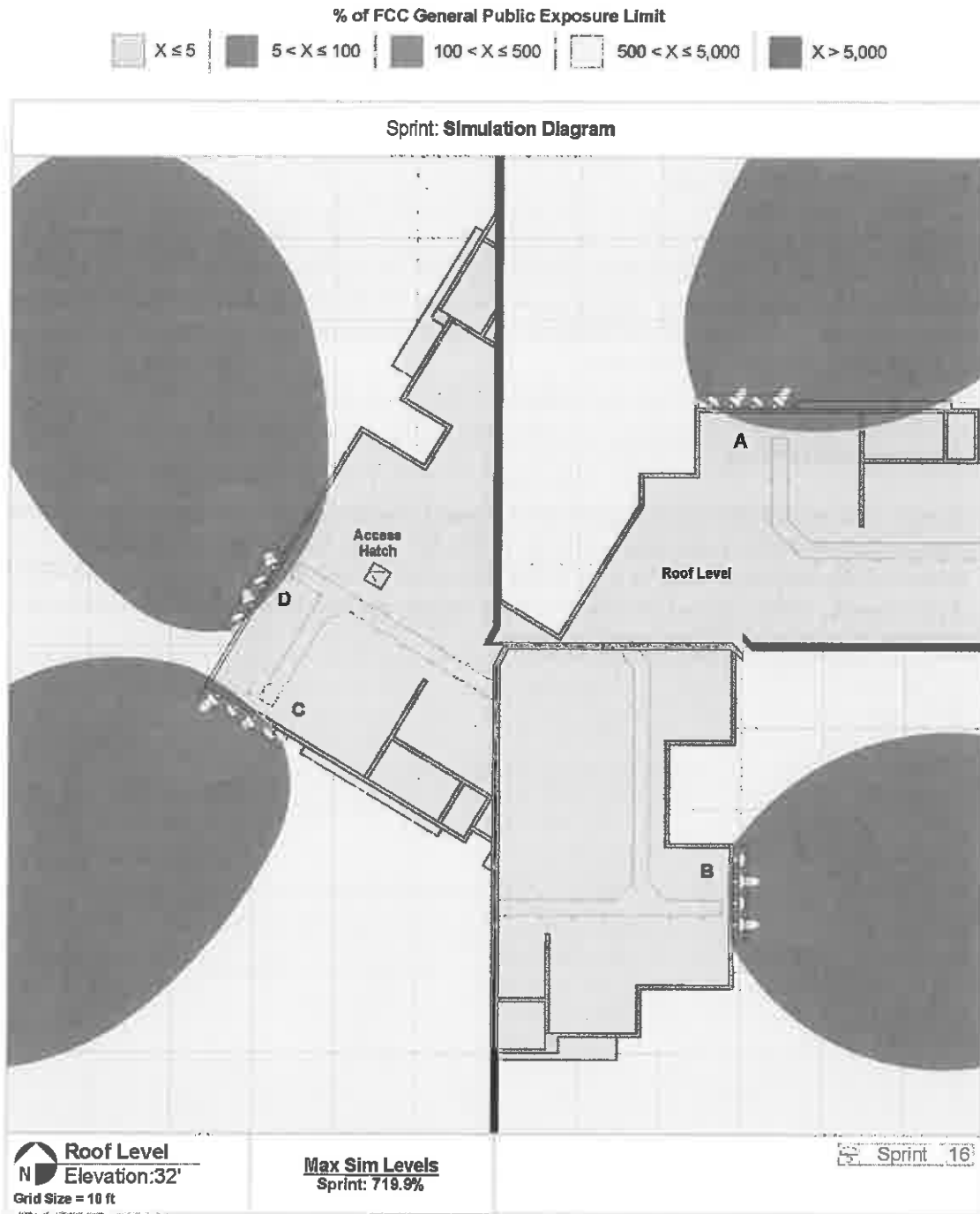


Figure 2: Plan (bird's eye) view map of results compared to FCC's General Population MPE (Maximum Permissible Exposure) Limits. Gray represents areas where exposure levels are calculated to be at or below 5%; Green- between 5% & 100% (below MPE limits); blue, yellow & red – greater than 100% (exceeds MPE limits).



4.0 CONCLUSION

4.1 Results

For a person standing in accessible areas on the ground, calculations for Sprint's site resulted in exposure levels below the FCC's most stringent General Population MPE Limits (see figure 1).

At roof elevation, the highest calculated exposure level is above the FCC's General Population MPE Limits near the Sprint antennas (see figure 2). Physical barriers are not feasible since the over-exposed areas are in the air, at or away from the roof edge.

There may be situations where workers i.e. window washers, painters, roofers, etc., may find themselves directly in front of the antennas. Individuals entering the site or working near/in front of antennas must receive appropriate RF safety training¹ and be made aware of the HotZones (areas where RF exposure may potentially exceed FCC safety limits). In addition, contact information should be made available in the event work is required within the HotZones.

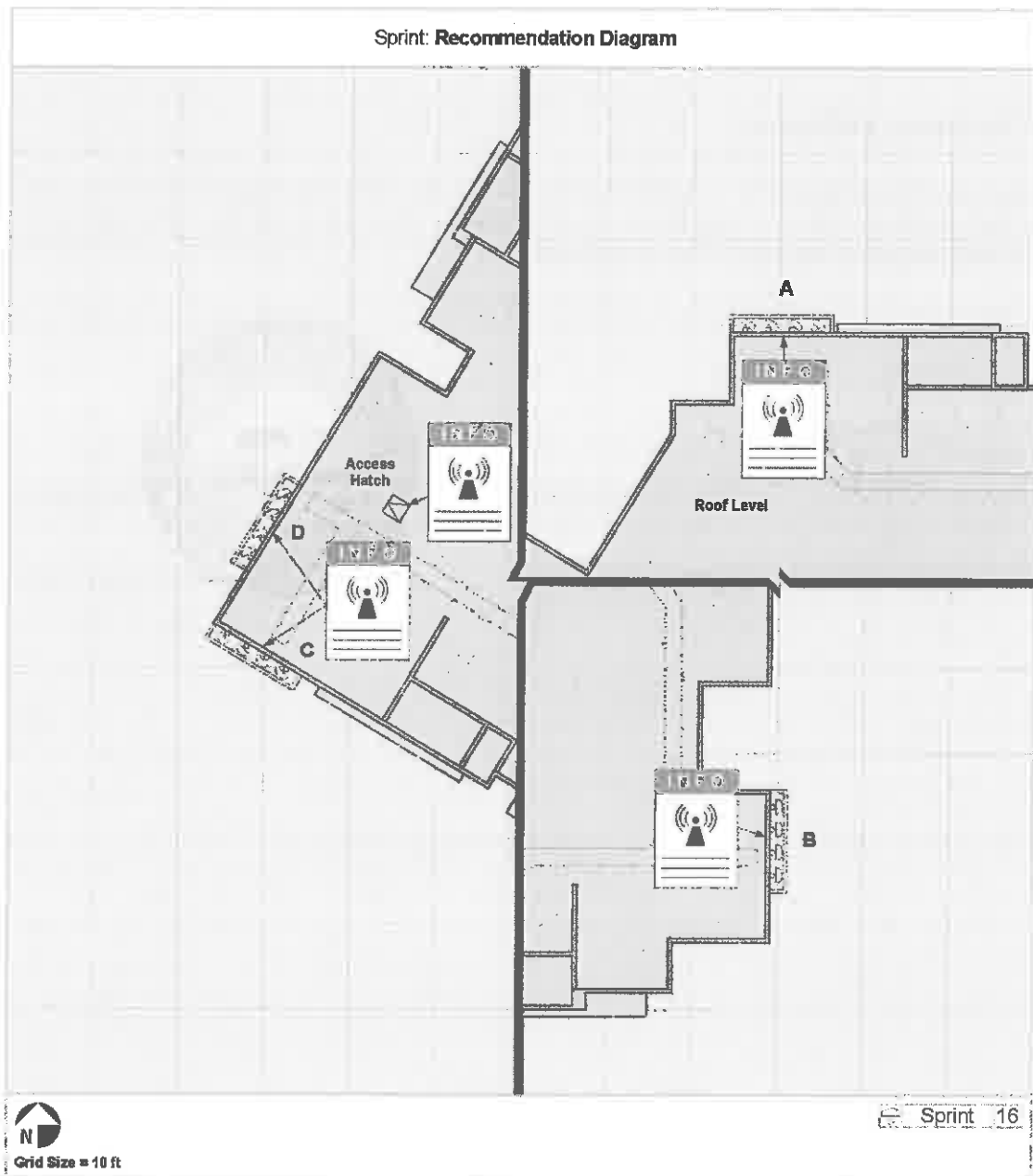
4.2 Recommendation(s)

For the facility to be classified as an Occupational/Controlled environment, the following conservative action(s) are recommended in accordance with the FCC's RF Safety Guidelines (see figure 3):

- 1) Access to the roof deck must be kept locked to restrict routine access by the general public.
- 2) As a courtesy, install Green INFORMATION Sign(s) on/near all sectors or at all antenna access points.

¹ See Appendix for Dtech's RF Safety training program - AntennaView®

Figure 3: Recommendation(s)



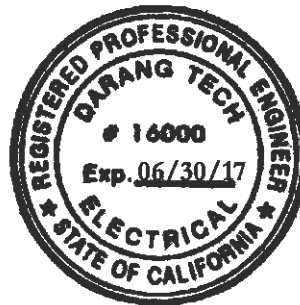
4.3 Statement of Compliance

Based on the above results, analysis and recommendation(s), it is the undersigned's professional opinion that Sprint's site is compliant with the FCC's RF Safety Guidelines.

4.4 Engineer Certification

This report has been prepared by or under the direction of the following Registered Professional Engineer: Darang Tech, holding California registration number 16000. I have reviewed this report and believe it to be both true and accurate to the best of my knowledge:


Darang Tech, P.E.



Appendix A: Background

Dtech uses the FCC's guidelines described in detail in Office of Engineering & Technology, Bulletin No. 65 ("OET-65") "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields". The table below summarizes the current Maximum Permissible Exposure ("MPE") safety limits classified into two groups: General population and Occupational.

Table 3: FCC MPE Limits (from OET-65)

Frequency (MHz)	General Population / Uncontrolled MPE (mW/cm ²)	Averaging Time (minutes)	Occupational / Controlled MPE (mW/cm ²)	Averaging Time (minutes)
30 - 300	0.2	30	1.0	6
300 - 1500	Frequency (Mhz)/1500 (0.2 - 1.0)	30	Frequency (Mhz)/300 (1.0 - 5.0)	6
1500 - 100,000	1.0	30	5.0	6

General population/uncontrolled limits apply in situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment, and may not be fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.

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

It is important to understand that the FCC guidelines specify *exposure* limits not *emission* limits. For a transmitting facility to be out of compliance with the FCC's RF safety guidelines an area or areas where levels exceed the MPE limits must, first of all, be in some way *accessible* to the public or to workers. When accessibility to an area where excessive levels is appropriately restricted, the facility or operation can certify that it complies with the FCC requirements.

Appendix B: Measurement and/or Computer Simulation Methods

Spatial averaging measurement technique is used. An area between 2 and 6 feet, approximately the size of an average human, is scanned in single passes from top to bottom in multiple planes. When possible, measurements were made at very close proximity to the antennas and inside the main beam where most of the energy is emitted. The spatial averaged values were recorded.

Dtech uses an industry standard power density prediction computer Model² to assess the worse-case, cumulative EMF impact of the surrounding areas of the subject site. The Model does not take into account losses due to buildings. Its methodologies are conservative enough to account for typical down-tilts deployed in wireless communications. In addition, the analysis is performed at 100% duty cycle—all transmitters are active at all times and transmitting at maximum power. For purposes of a cumulative study, nearby transmitters are included where possible. The result is a surrounding area map color-coded to percentages of the applicable FCC's MPE Limits. A result higher than 100% exceeds the Limits.

Appendix C: Limitations

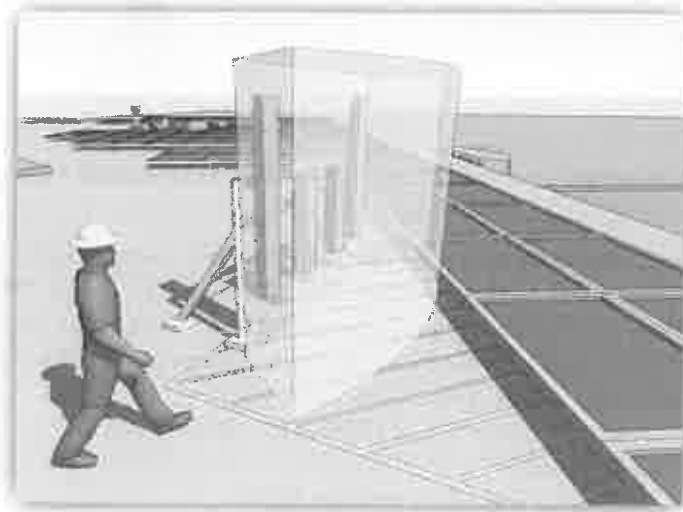
Dtech performed this analysis based on data provided by our clients that Dtech believes to be true and correct. Estimates where noted, are based on common industry practices and our best interpretation of available information. As mobile technologies continuously change, these data and results may also change. Therefore, Dtech disclaims all other warranties either expressed or implied. Any use of this document constitutes an agreement to hold Dtech and its employees harmless and indemnify it for any and all liability, claims, demands, litigation expenses and attorneys fees arising from such use. This is a technical document and may contain minor grammatical and/or spelling errors.

² Roofview® Version 4.15, Richard Tell Associates, Inc. © 1996-2000.

Appendix D: AntennaView®

Dtech Communications offers a unique, online tool (AntennaView®) to train, identify and inform individuals of site-specific HotZones – areas that may potentially exceed the FCC's Safety Limits. AntennaView® is an online, interactive training tool that will educate nontechnical people in about ten minutes. It is a site-specific, RF safety training program that requires the end user to sign an online agreement thereby limiting the liability to the landlord and carriers. Some of the advantages include:

- Virtual walk-through in 3-D with corresponding photographs
- Site-specific, interactive, simple to understand
- Delivers pertinent information i.e. HotZones (areas that may potentially exceed FCC safety limits), site owners and contact numbers.
- User online agreement = accountability



We invite you to take a quick tour at www.AntennaView.com and see how easy to understand and informative AntennaView® is.

Under Article 47 CFR § 1.1307(b), the FCC & OSHA mandates wireless operators/facility owners to have an RF survey completed including a safety plan and training to ensure that their tenants, employees and contractors who work in or around RF sites are aware of the potential risks posed by RF radiation. Most cell sites are located on building rooftops where HVAC contractors, window washers, painters, etc. routinely work and generally do not know what antennas even look like. Dtech Communications can help with ongoing FCC/OSHA compliance and provide practical training that is easy to understand by anyone regardless of their technical background.

Appendix E: RF Advisory Signs



Blue NOTICE Sign



Yellow CAUTION Sign



Orange WARNING Sign



Red DANGER Sign

RF exposure advisory signs³ must include at least the following five components:

- (A) Appropriate signal word and associated color (*i.e.*, “DANGER” (red), “WARNING” (orange), “CAUTION,” (yellow) “NOTICE” (blue)) in accord with IEEE Std C95.2-1999, “IEEE Standard for Radio-Frequency Energy and Current-Flow Symbols,” copyright 1999 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017
- (B) RF energy advisory symbol (Figure A.3 of IEEE Std C95.2-1999)
- (C) An explanation of the RF source
- (D) Behavior necessary to comply with the exposure limits
- (E) Contact information



Green INFORMATION Sign

Green INFORMATION: This optional sign should include at least the following information: appropriate signal word “INFORMATION” and associated color (green) in accord with section 5.8 of IEEE Std C95.2-1999, a specification of the RF source, contact information, and a reminder to obey all postings and boundaries.

³ FCC 13-39