

LU Committee

From: Rich Conte <rich.conte@wirelessresources.com>
Sent: Friday, October 26, 2018 10:21 AM
To: LU Committee
Cc: Raynette Yap; Carla Nakata; Livit Callentine
Subject: 3740 Lower Honoapiilani Road. Passing_ EME (Electro-Magnetic-Energy) Report.
Attachments: HI80XC017_Local_Ask_NSB_RF_EME_Report_10.25.18 (003).pdf

Council Chair,

Please advised that this report that was completed by an independent consulting firm shows that the proposed cell site operates below the F.C.C. regulated standards.

Mahalo

Rich Conte

Wireless Resources, Inc.
758 Kapahulu Ave.#100-1062
Honolulu, Hi.96816
Mobile 808-781-8571

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

Site No. HI80XC017
South Kahana Maui
3740 Lower Honoapiilani Rd.
Lahaina, Hawaii 96761
Maui County
20.955686; -156.683361 NAD83
Monopalm

EBI Project No. 6218006889
October 24, 2018



Prepared for:
Sprint Nextel
c/o Wireless Resources, Inc.
101 Convention Center Drive
Las Vegas, Nevada 89126

Prepared by:



EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by Sprint to conduct radio frequency electromagnetic (RF-EME) modeling for Sprint Site HI80XC017 located at 3740 Honoapilani Hwy. in Lahaina, Hawaii to determine RF-EME exposure levels from proposed Sprint wireless communications equipment at this site. As described in greater detail in Appendix B of this report, 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 a detailed summary of the RF EME analysis for the site.

This document addresses the compliance of Sprint's proposed transmitting facilities independently at the site.

Modeling results included in this report are based on drawings dated October 10, 2018 as provided to EBI Consulting. Subsequent changes to the drawings or site design may yield changes in the MPE levels or FCC Compliance recommendations.

Maximum Permissible Exposure (MPE) Summary			
Location	% of FCC General Public/Uncontrolled Exposure Limit	% of FCC Occupational/Controlled Exposure Limit	Power Density (mW/cm²)
Sprint Equipment			
Ground	5.80	1.16	0.03093

Statement of Compliance

Based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0 and Appendix A. Posting of the signage brings the site into compliance with FCC rules and regulations.

1.0 LOCATION OF ALL EXISTING ANTENNAS AND FACILITIES AND EXISTING RF LEVELS

Sprint proposes the installation of six (6) wireless telecommunication antennas on a monopalm in Lahaina, Hawaii. The proposed modification will result in a total of six (6) Sprint antennas at the site. There are three (3) sectors proposed at the site, with two (2) proposed antennas per sector.

There are no collocated carriers on the monopalm.

2.0 LOCATION OF ALL APPROVED (BUT NOT INSTALLED) ANTENNAS AND FACILITIES AND EXPECTED RF LEVELS FROM THE APPROVED FACILITIES

There are no antennas or facilities that are approved and not installed based on information provided to EBI and Sprint at the time of this report.

3.0 NUMBER AND TYPES OF WIRELESS TELECOMMUNICATION SITES (WTS) WITHIN 100 FEET OF THE PROPOSED SITE

There are no other Wireless Telecommunication Service (WTS) sites observed within 100 feet of the proposed site.

4.0 LOCATION AND NUMBER OF THE SPRINT ANTENNAS AND BACK-UP FACILITIES PER STRUCTURE AND NUMBER AND LOCATION OF OTHER TELECOMMUNICATION FACILITIES ON THE PROPERTY

Sprint proposes the installation of six (6) wireless telecommunication antennas on a monopalm in Lahaina, Hawaii. The proposed modification will result in a total of six (6) Sprint antennas at the site. There are three (3) sectors proposed at the site, with two (2) proposed antennas per sector. In each sector, there is proposed to be one antenna transmitting in the 800/1900 MHz frequency ranges and one antenna transmitting in the 2500 MHz frequency range. The Sector A antennas will be oriented 0° from true north. The Sector B antennas will be oriented 120° from true north. The Sector C antennas will be oriented 240° from true north. The bottoms of the antennas will be approximately 28 feet above ground level.

There are no collocated carriers on the monopalm.

5.0 POWER RATING FOR ALL EXISTING AND PROPOSED BACKUP EQUIPMENT SUBJECT TO THE APPLICATION

The operating power of each frequency, for modeling purposes, was assumed to be the following:

Sprint Operating Powers Per Sector		
Frequency (MHz)	Power (Watts)	# of Transmitters
800	45.17	1
1900	13.5	1
2500	7.85	1

Additional transmitter information used in the modeling of Sprint antennas is summarized in the RoofView® export file presented in Appendix D.

6.0 TOTAL NUMBER OF WATTS PER INSTALLATION AND THE TOTAL NUMBER OF WATTS FOR ALL INSTALLATIONS ON THE STRUCTURE

The Effective Radiated Power (ERP) for each carrier and frequency is summarized below:

Effective Radiated Power (ERP) per Frequency	
Frequency (MHz)	ERP (Watts)
800	891
1900	447
2500	316

7.0 PREFERRED METHOD OF ATTACHMENT OF PROPOSED ANTENNA WITH PLOT OR ROOF PLAN INCLUDING: DIRECTIONALITY OF ANTENNAS, HEIGHT OF ANTENNAS ABOVE NEAREST WALKING SURFACE, DISCUSS NEARBY INHABITED BUILDINGS

Based on the information provided to EBI, the proposed antennas are to be to the monopalm and operating in the directions, frequencies, and heights mentioned in section 4.0 above. The surrounding area appears to be of commercial use.

8.0 ESTIMATED AMBIENT RADIO FREQUENCY FIELDS FOR THE PROPOSED SITE

Based on worst-case predictive modeling, there are no modeled exposures on any accessible ground-level walking/working surface related to Sprint’s proposed equipment in the area that exceed the FCC’s occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Maximum Permissible Exposure (MPE) Summary			
Location	% of FCC General Public/Uncontrolled Exposure Limit	% of FCC Occupational/Controlled Exposure Limit	Power Density (mW/cm ²)
Sprint Equipment			
Ground	5.80	1.16	0.03093

The inputs used in the modeling are summarized in the RoofView® export file presented in Appendix D.

9.0 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 (DISCUSS SIGNAGE FOR THOSE WHO SPEAK LANGUAGES OTHER THAN ENGLISH)

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. It is recommended that Notice signs be installed for the new antennas making people aware of the antennas locations. There are no exposures above the FCC limits in front of the proposed antennas and therefore barriers are not recommended.

Workers that are elevated above the ground may be exposed to power densities greater than the occupational limit. Workers should be informed about the presence of antennas and their associated fields and practice RF Safety Procedures. To reduce the risk of exposure and/or injury, EBI recommends

that access to the monopalm or areas associated with the active antenna installation be restricted and secured where possible.

Access to this site is accomplished via a gate in the fence surrounding the monopalm. Workers must be elevated to antenna level to access them, so these antennas are not accessible to the general public.

10.0 STATEMENT ON WHO PRODUCED THIS REPORT AND QUALIFICATIONS

Please see the certifications attached in Appendix C below.

11.0 LIMITATIONS

This report was prepared for the use of Sprint. 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 EBI are based solely on the information provided by the client. 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.

12.0 SUMMARY AND CONCLUSIONS

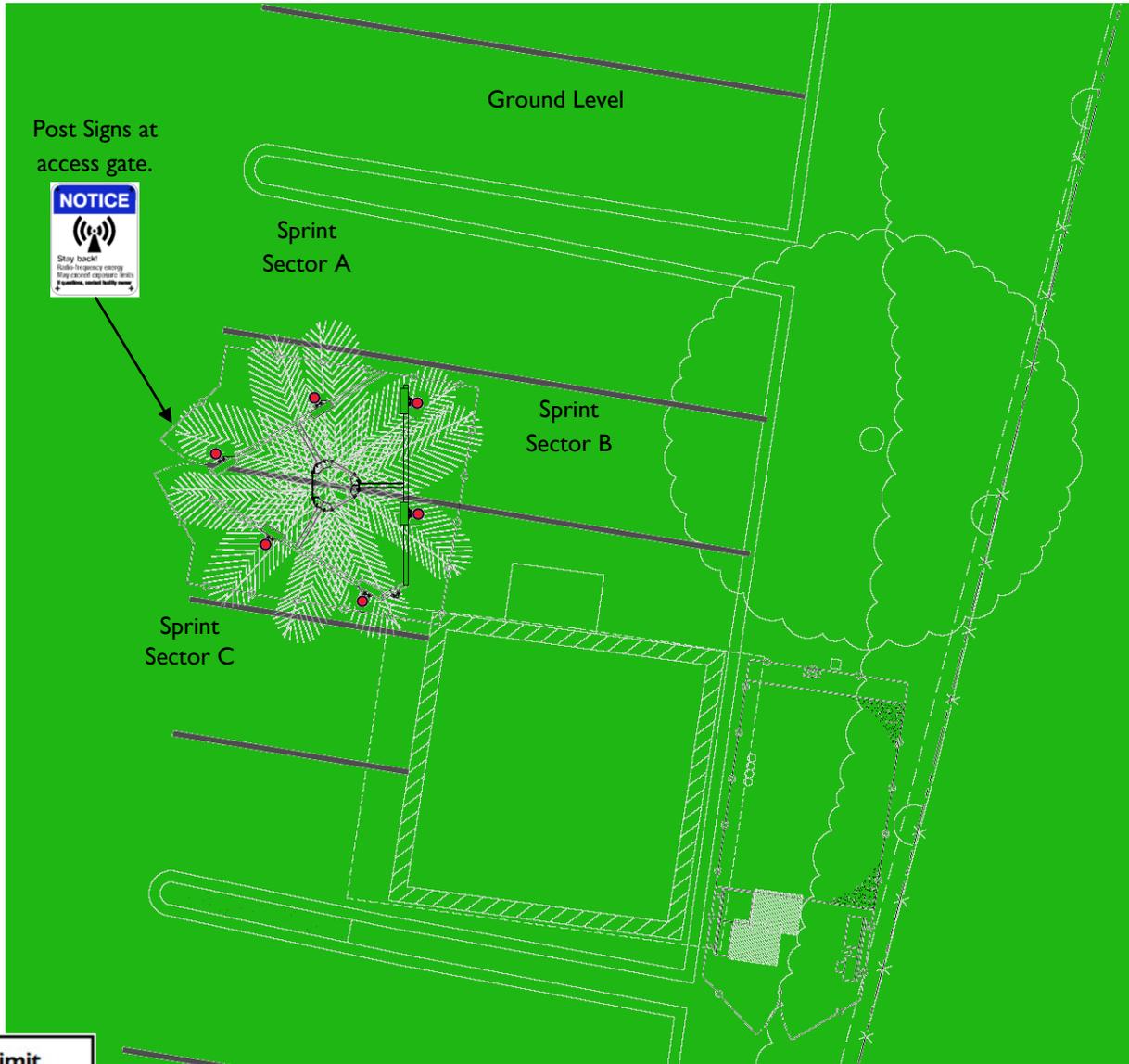
EBI has prepared this Radiofrequency Emissions Compliance Report for the proposed Sprint telecommunications equipment at the site located at 3740 Honoapilani Hwy. in Lahaina, Hawaii.

EBI has conducted theoretical modeling to estimate the worst-case power density from proposed Sprint 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 no modeled exposures on any accessible ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0 and Appendix A. Posting of the signage brings the site into compliance with FCC rules and regulations.

Appendix A

MPE Analysis and Recommended Signage



% FCC Public Exposure Limit	
■	Exposure Level $\geq 5,000$
■	$500 < \text{Exposure Level} \leq 5,000$
■	$100 < \text{Exposure Level} \leq 500$
■	Exposure Level ≤ 100



■ Sprint Antennas

MPE Analysis and Recommended Signage

Facility Operator: Sprint

Site Name: South Kahana Maui

Sprint Site Number: HI80XC017

Report Date: October 24, 2018

Appendix B
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 I and Figure I (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 and 2500 MHz frequency ranges. For the Sprint equipment operating at 800 MHz, the FCC's occupational MPE is 2.66 mW/cm² and an uncontrolled MPE limit of 0.53 mW/cm². For the Sprint 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.

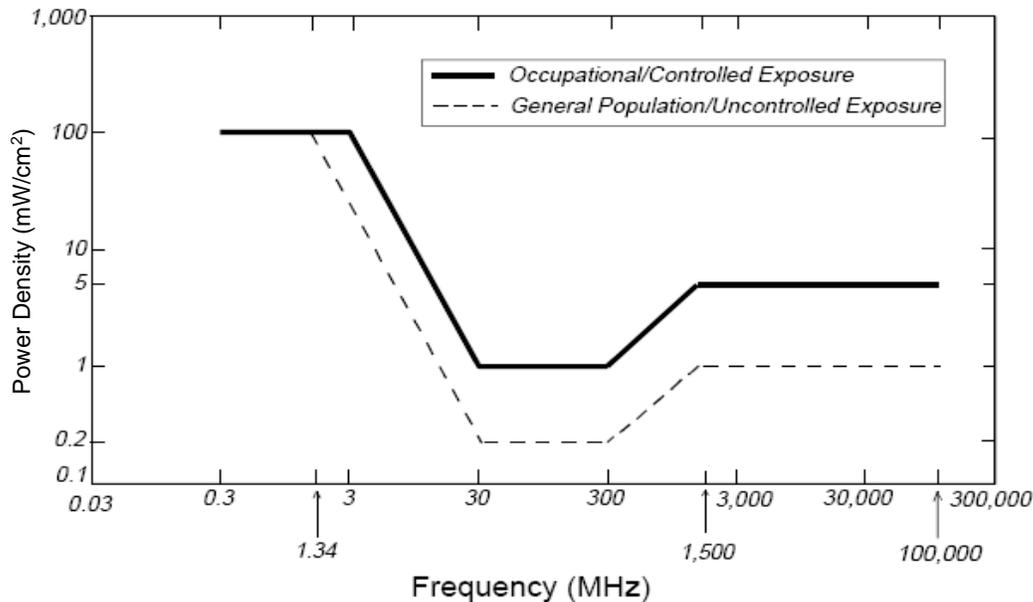
Table I: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time [E] ² , [H] ² , or S (minutes)
0.3-3.0	614	1.63	(100)*	6
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/cm²)	Averaging Time [E]², [H]², or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	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
Long-Term Evolution (LTE)	2,100 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Personal Communication Services (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

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 Services (PCS) facilities used by Sprint in this area operate within a frequency range of 800-2500 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.

Advanced Wireless Services (AWS) facilities used by Sprint in this area operate within a frequency range of 2496 - 2690 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets); and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units. Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS/AWS 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 C

Certifications

Preparer Certification

I, Christopher Ilgenfritz, 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 on RF-EME modeling using RoofView® modeling 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.



Appendix D

Roofview® Export File / Antenna Inventory

StartMapDefinition																				
Roof Max	Roof Max	Map Max	Map Max	Y Offset	X Offset	Number o envelope														List Of Areas
170	160	180	170	10	10	1	\$U\$41:\$FX	\$U\$41:\$FX	\$U\$210											\$U\$41:\$FX\$210
StartSettingsData																				
Standard	Method	Uptime	Scale Fact	Low Thr	Low Color	Mid Thr	Mid Color	Hi Thr	Hi Color	Over Color	Ap Ht Mult		Ap Ht Method							
4	2	3	1	100	1	500	4	5000	2	3	1.5	1								
StartAntennaData																				
It is advisable to provide an ID (ant 1) for all antennas																				
ID	Name	Freq (MHz)	Trans Power	Trans Count	Coax Len	Coax Type	Other Loss	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain	BWdth Pt Dir	Uptime Profile	ON flag
SPT A1	ESMR	800	45.17	1			0			Commscope	APXVBLL20X	16	58	28.39167		6.883333	12.95	69;0		ON•
SPT A1	PCS	1900	13.5	1			0			Commscope	APXVBLL20X	16	58	28.39167		6.883333	15.2	62;0		ON•
SPT A2	LTE	2500	7.85	1			0			RFS	TTTT65AP-1XR	22	61	29.19167		5.283333	16.05	68;0		ON•
SPT A1	ESMR	800	45.17	1			0			Commscope	APXVBLL20X	28	61	28.39167		6.883333	12.95	69;120		ON•
SPT A1	PCS	1900	13.5	1			0			Commscope	APXVBLL20X	28	61	28.39167		6.883333	15.2	62;120		ON•
SPT A2	LTE	2500	7.85	1			0			RFS	TTTT65AP-1XR	28	54	29.19167		5.283333	16.05	68;120		ON•
SPT A1	ESMR	800	45.17	1			0			Commscope	APXVBLL20X	25	49	28.39167		6.883333	12.95	69;240		ON•
SPT A1	PCS	1900	13.5	1			0			Commscope	APXVBLL20X	25	49	28.39167		6.883333	15.2	62;240		ON•
SPT A2	LTE	2500	7.85	1			0			RFS	TTTT65AP-1XR	19	53	29.19167		5.283333	16.05	68;240		ON•
StartSymbolData																				
Sym	Map Mark	Roof X	Roof Y	Map Label: Description (notes for this table)																
Sym		5	35	AC Unit Sample symbols																
Sym		14	5	Roof Access																
Sym		45	5	AC Unit																
Sym		45	20	Ladder																