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ELECTROMAGNETIC FIELDS ASSESSMENT

at

80 – 88 Regent Street

Redfern NSW

Prepared For

Milligan Group

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Electromagnetic Fields Assessment
Milligan Group

1 INTRODUCTION

An electromagnetic fields (EMF) assessment has been carried out for the proposed 20-storey building that is to be located at 80-88 Regent St, Redfern NSW 2016. The purpose of the survey was to identify any significant sources of EMF, and to assess the potential exposure impact on the occupants of the building.

There are two categories of EMF sources that have been identified in this report. The mobile phone base stations were assessed according to ARPANSA RPS3 which is the applicable radio frequency (RF) exposure standard. There is also a sub-power station, which has been assessed with reference to the ICNIRP guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz – 100 kHZ) (2010) which is the applicable extra-low frequency (ELF) exposure standard.

2 EXTRA LOW FREQUENCIES (ELF)

Predicting magnetic fields around substations is highly dependent on the particular substation configuration. The following measures are intended to be overly conservative to enable a more general approach.

2.1 Distance

Electromagnetic fields from ELF sources do not easily radiate away from the source, and as a result the field strength drops away very quickly with distance. EMC Technologies has conducted surveys on various substations, and typically the field strength from these substations at 0.5m is no more than 10% of the limit, and falls below 1% of the limit at distances greater than 5m away.

The shortest distance from the proposed substation area to the proposed childcare area is 4m (refer Appendix B).

2.2 Current

ELF magnetic field strength is proportional to the amount of current being passed through a conductor. A conservative estimate for magnetic flux density from an energised conductor is given in the following formula:

$$B = 2 \times \frac{I}{D}$$

Where *B* is the magnetic flux density in milli-guass, *I* is the current in amperes, and *D* is the distance from the conductor in metres.

The closest distance between the childcare centre area and the substation is 4m (refer Appendix B). The following table shows the predicted field strength* as a percentage of the limit for various load currents.

Table 1: Worst Case Field Strength Calculations at 4m Distance

Load Current (A)	Flux Density (mG)*	% of ICNIRP General Public Limit
100	50	2.50%
200	100	5.00%
300	150	7.50%
500	250	12.50%
1000	500	25.00%
1500	750	37.50%
2000	1000	50.00%
3000	1500	75.00%
5000	2500	125.00%

***NOTE:** The calculated flux density is based on a conservative formula that does not take into account losses through walls, co-location of phases, magnetic cores, shielding or other real world losses. The actual values are likely to be much lower than the values shown in the table above.

Assuming the maximum load current on the low voltage side of the substation transformer is less than 2000A, there is very little risk of the magnetic field strength approaching the general public limit anywhere in the childcare centre.

3 RADIO FREQUENCIES (RF)

The following active radio base stations were listed on the radio frequency national site archive as being within 300m of 80 – 88 Regent St Redfern:

- 2016001 – South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square Redfern
- 2016005 – 101-103 George St Redfern

The following active broadcast sites were listed in the ACMA Radiocommunications broadcast licence table as being within 300m of 80 – 88 Regent St Redfern:

- GCA Building 1 Lawson Square Redfern

A radio frequency field assessment was done within a 500m radius of each site listed above, at a height of 1.5m above the ground in accordance with ARPANSA RPS3 methodology. 80-88 Regent St Redfern was treated as a Point of Interest, and an additional height scan between 0m and 10m was done in this location. This corresponds to the height where the childcare centre will be located.

For each radio-frequency site listed above, the maximum field values determined between 0m and 10m at 80-88 Regent St were subsequently added together to get the total field value as a percentage of the limit.

Table 2: Maximum EME Levels at 80-88 Regent St Redfern (0m to 10m Above Ground)

Site Description	Percentage of General Public Limit
2016001 – South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square Redfern	0.0032%
2016005 – 101-103 George St Redfern	0.77%
GCA Building 1 Lawson Square Redfern	0.61%
TOTAL	**1.3832%**

No fields are predicted to exceed the general public reference levels.

The individual assessment reports are given in Appendix A.

4 CONCLUSION

Following the analysis of electromagnetic sources around 80-88 Regent St Redfern, the potential exposure impact is considered to be very low.

Formulas used in the assessment represent a theoretical worst case scenario, and the results showed that for the existing RF sources, no fields at the childcare centre were in excess of the ARPANSA general public exposure limits.

The assessment of the substation showed that the physical separation of the substation from the childcare centre should be sufficient to ensure no fields in excess of the ICNIRP general public limits are present in the childcare centre, if the maximum load current is less than 2000A.

APPPENDIX A – RF ENVIRONMENTAL ASSESSMENT REPORTS

Environmental EME Report
South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square, REDFERN NSW 2016

This report provides a summary of Calculated RF EME Levels around the wireless base station

Date 21/6/2016 **RFNSA Site No. 2016001**

Introduction

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square REDFERN NSW 2016. These levels have been calculated by Huawei using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the existing systems at this site is 0.16% of the public exposure limit and with proposed alterations to this site the calculated maximum EME level will be 0.19% of the public exposure limit.

The ARPANSA Standard

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

How the EME is calculated in this report

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at http://www.arpansa.gov.au.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all mobile phone antennas at this site.
The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m²) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

Results

The maximum EME level calculated for the existing systems at this site is 1.89 V/m; equivalent to 9.5 mW/m² or 0.16% of the public exposure limit.
The maximum EME level calculated for the existing and proposed systems at this site is 2.038 V/m; equivalent to 11.014 mW/m² or 0.19% of the public exposure limit.

Radio Systems at the Site

This base station currently has equipment for transmitting the following services:

Carrier	Radio Systems
Vodafone	GSM900, LTE1800, GSM1800

It is proposed that this base station will have equipment for transmitting the following services:

Carrier	Radio Systems
Vodafone	GSM900, LTE1800, GSM1800
Vodafone Hutchison Australia	WCDMA850 (proposed)

Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Existing and Proposed Equipment		
	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits
0m to 50m	0.91	2.17	0.024%	0.91	2.18	0.024%
50m to 100m	0.47	0.58	0.0084%	0.5	0.65	0.011%
100m to 200m	1.31	4.55	0.095%	1.35	4.81	0.1%
200m to 300m	1.89	9.5	0.16%	2.038	11.014	0.19%
300m to 400m	1.88	9.4	0.15%	2.032	10.95	0.19%
400m to 500m	1.55	6.4	0.094%	1.72	7.84	0.13%
Maximum EME level	1.89	9.5	0.16	2.038	11.014	0.19
	288.092 m from the antennas at South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square			288.092 m from the antennas at South Sydney Council Building, Ex TNT Plaza, Tower 2, Lawson Square		

Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations	Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
		Electric Field V/m	Power Density mW/m²	% of ARPANSA exposure limits
80-88 Regent Street Redfern	0m to 10m	0.24	0.15	0.0032%

RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m²), microwatts per square centimetre (µW/cm²) and milliwatts per square metre (mW/m²). Note: 1 W/m² = 100 µW/cm² = 1000 mW/m².

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m² = 375 µW/cm² = 3750 mW/m²
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m² = 900 µW/cm² = 9000 mW/m²
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²

Further Information

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Federal Government agency incorporated under the Health and Ageing portfolio. ARPANSA is charged with responsibility for protecting the health and safety of people, and the environment, from the harmful effects of radiation (ionising and non-ionising).

Information about RF EME can be accessed at the ARPANSA website, http://www.arpansa.gov.au, including:

- Further explanation of this report in the document "Understanding the ARPANSA Environmental EME Report"
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; "Radio Frequency EME Exposure Levels - Prediction Methodologies"
- the current RF EME exposure standard
  Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, 'Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz', Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.
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The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at http://emr.acma.gov.au

The Communications Alliance Ltd Industry Code C564:2011 'Mobile Phone Base Station Deployment' is available from the Communications Alliance Ltd website, http://commsalliance.com.au .

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, http://www.rfnsa.com.au.

Environmental EME Report
101-103 GEORGE ST, REDFERN NSW 2016

This report provides a summary of Calculated RF EME Levels around the wireless base station

Date 21/6/2016 **RFNSA Site No. 2016005**

Introduction

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at 101-103 GEORGE ST REDFERN NSW 2016. These levels have been calculated by Huawei using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the existing systems at this site is 2.79% of the public exposure limit.

The ARPANSA Standard

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

How the EME is calculated in this report

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at http://www.arpansa.gov.au.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all mobile phone antennas at this site.
The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m²) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

Results

The maximum EME level calculated for the existing systems at this site is 8.71 V/m; equivalent to 201.12 mW/m² or 2.79% of the public exposure limit.

Radio Systems at the Site

This base station currently has equipment for transmitting the following services:

Carrier	Radio Systems
Telstra	LTE1800, WCDMA2100, WCDMA850, GSM900, LTE700
Vodafone	WCDMA900, LTE1800, WCDMA2100, WCDMA850, LTE850
Optus	GSM900, WCDMA900, WCDMA2100, LTE1800, LTE2300, LTE700, LTE2600

There are currently no proposed radio systems for this site.

Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at 101-103 GEORGE ST in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Existing and Proposed Equipment		
	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits
0m to 50m 50m to 100m 100m to 200m 200m to 300m 300m to 400m 400m to 500m	2.17 4.051 8.71 7.32 4.78 3.39	12.54 43.54 201.12 141.94 60.52 30.53	0.15% 0.76% 2.79% 1.99% 0.81% 0.39%			
Maximum EME level	8.71	201.12	2.79			
	151.58 m from the antennas at 101-103 GEORGE ST					

Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations	Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
		Electric Field V/m	Power Density mW/m²	% of ARPANSA exposure limits
Redfern Occasional Child Care Centre 80-88 Regent Street Redfern	0m to 3m 0m to 10m	6.63 4.64	116.74 57.2	1.61% 0.77%

RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m²), microwatts per square centimetre (µW/cm²) and milliwatts per square metre (mW/m²). Note: 1 W/m² = 100 µW/cm² = 1000 mW/m².

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m² = 375 µW/cm² = 3750 mW/m²
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m² = 900 µW/cm² = 9000 mW/m²
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²

Further Information

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Federal Government agency incorporated under the Health and Ageing portfolio. ARPANSA is charged with responsibility for protecting the health and safety of people, and the environment, from the harmful effects of radiation (ionising and non-ionising).

Information about RF EME can be accessed at the ARPANSA website, http://www.arpansa.gov.au, including:

- Further explanation of this report in the document "Understanding the ARPANSA Environmental EME Report"
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; "Radio Frequency EME Exposure Levels - Prediction Methodologies"
- the current RF EME exposure standard
  Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, 'Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz', Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.
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The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at http://emr.acma.gov.au

The Communications Alliance Ltd Industry Code C564:2011 'Mobile Phone Base Station Deployment' is available from the Communications Alliance Ltd website, http://commsalliance.com.au .

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, http://www.rfnsa.com.au.

Environmental EME Report
GCA Building
1 Lawson Square Redfern

This report provides a summary of Calculated RF EME Levels around the wireless broadcast site

Date 21/6/2016 RFNSA Site No.

Introduction

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless broadcast site at 1 Lawson Square Redfern. These levels have been calculated by EMC Technologies using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the existing systems at this site is 1.56% of the public exposure limit.

The ARPANSA Standard

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

How the EME is calculated in this report

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at http://www.arpansa.gov.au.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all mobile phone antennas at this site.
The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m²) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

Results

The maximum EME level calculated for the existing systems at this site is 3.43 V/m; equivalent to 31.22 mW/m² or 1.56% of the public exposure limit.

Radio Systems at the Site

This base station currently has equipment for transmitting the following services:

Carrier	Radio Systems

There are currently no proposed radio systems for this site.

Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at 80-88 Regent St Redfern in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Existing and Proposed Equipment		
	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits
0m to 50m	2.67	18.92	0.95%			
50m to 100m	3.35	29.8	1.49%			
100m to 200m	3.43	31.22	1.56%			
200m to 300m	3.43	31.22	1.56%			
300m to 400m	2.49	16.41	0.82%			
400m to 500m	1.59	6.72	0.34%			
Maximum EME level	3.43	31.22	1.56			
	200.29 m from the antennas at 80-88 Regent St Redfern					

Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations	Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
		Electric Field V/m	Power Density mW/m²	% of ARPANSA exposure limits
80-88 Regent St Redfern	0m to 10m	2.15	12.27	0.61%

RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m²), microwatts per square centimetre (µW/cm²) and milliwatts per square metre (mW/m²). Note: 1 W/m² = 100 µW/cm² = 1000 mW/m².

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m² = 375 µW/cm² = 3750 mW/m²
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m² = 900 µW/cm² = 9000 mW/m²
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²

Further Information

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Information about RF EME can be accessed at the ARPANSA website, http://www.arpansa.gov.au, including:

- Further explanation of this report in the document "Understanding the ARPANSA Environmental EME Report"
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; "Radio Frequency EME Exposure Levels - Prediction Methodologies"
- the current RF EME exposure standard
  Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, 'Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz', Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.
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The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at http://emr.acma.gov.au

The Communications Alliance Ltd Industry Code C564:2011 'Mobile Phone Base Station Deployment' is available from the Communications Alliance Ltd website, http://commsalliance.com.au .

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, http://www.rfnsa.com.au.

APPPENDIX B – PROXIMITY OF SUBSTATION TO CHILDCARE CENTRE

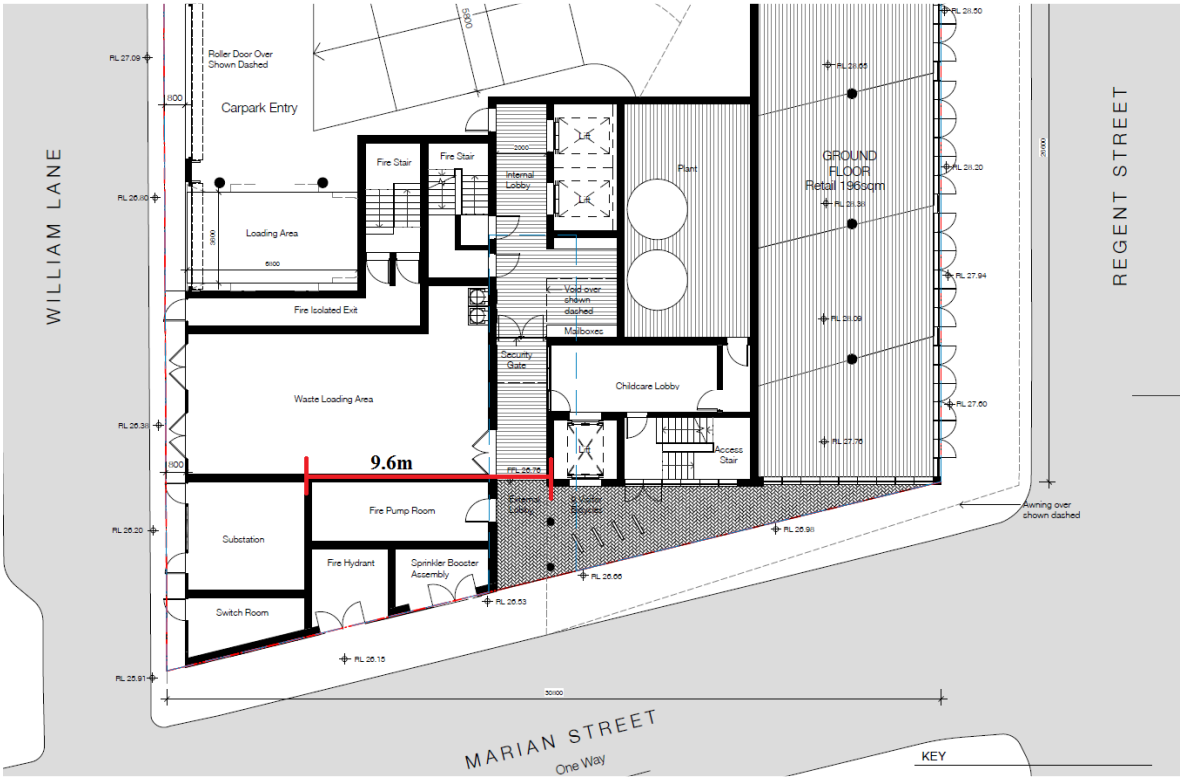

Figure 1: Location of Substation and Childcare Centre

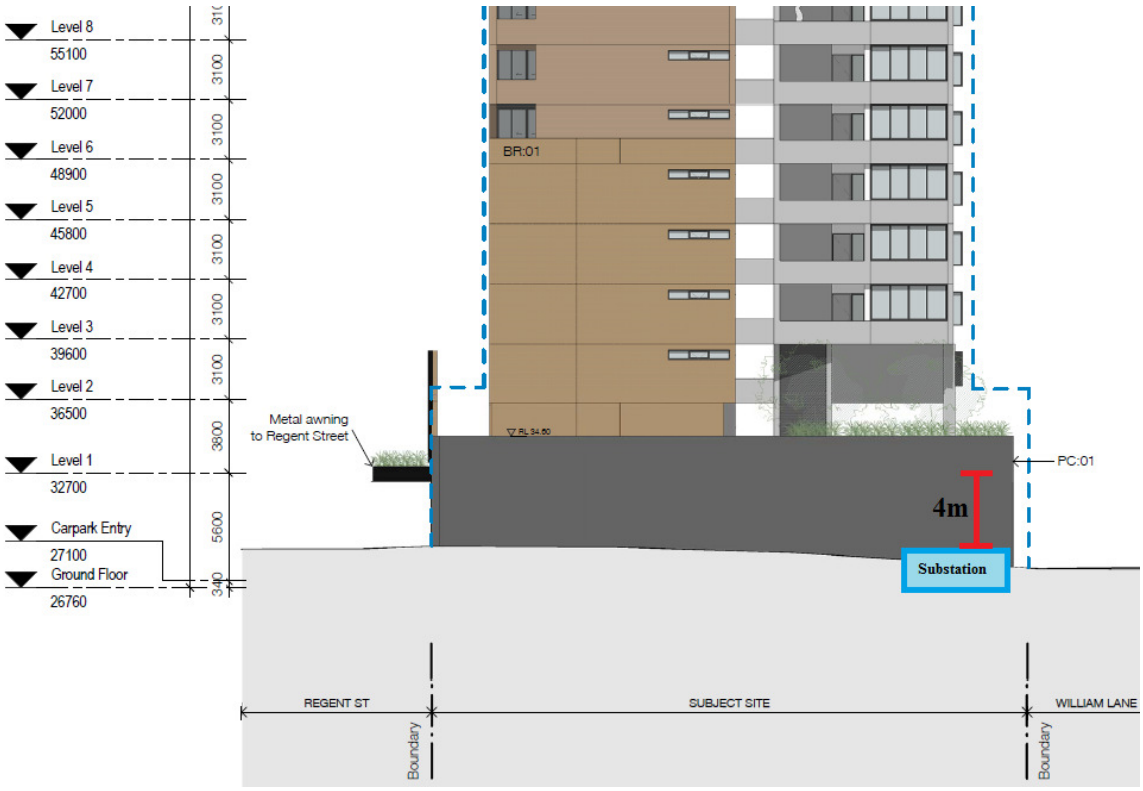

Figure 2: Location of Substation and Childcare Centre