Cellular mast emissions survey: Regal Construction

Document details

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1 Executive summary

The Jersey Competition and Regulatory Authority or JCRA regularly monitors emission levels from the cellular masts in Jersey[1] to ensure the mobile network operators who operate their services from those masts comply with their license obligations in terms of power levels and that the levels from the sites meet the internationally recognised standards and guidelines regarding health and safety limits for the public.

In 2017, the JCRA commissioned surveys to measure the electromagnetic field (EMF) emission levels at all the sites hosting mobile telecommunication equipment within the island. Further surveys have been conducted in each subsequent year focussing on new sites, those where significant changes have been made by the operators or those where the public have raised concerns to the JCRA in the previous year. This report presents the results of the survey conducted at the Regal Construction site in 2025.

In 2025, the Jersey mobile network operators have launched their first commercial 5G services. This year's audits therefore include the frequency bands used for 5G, noting however that not all sites currently have 5G transmitting equipment.

The Regal Construction site was used by a single operator at the time of the survey: JT. Surveys were conducted at all cellular frequency bands (700, 800, 900, 1800, 2100, 2600 and 3400MHz) for all mobile cellular technologies (2G, 3G, 4G and 5G) and for all three cellular operators as a routine procedure. Even though the reported levels are expected to be predominantly emitted from this site, the test equipment does not discriminate between nearby sites which means that the levels are cumulated over all site emissions detected by the test instrument.

The survey established that the emission levels around the site were low and remain below the safety limits for the public advised by internationally recognised standards.

The values shown hereafter are the maximum levels recorded around the site following a peak search. The levels were found to be lower at all the other locations round this site. The recorded values are true at the time of testing and can go up or down depending on the level of user activity on the site.

The total Exposure Quotient (EQ) for the site recorded across all detected cellular frequency bands is given at the bottom of the summary table below. A total EQ close to 1 (one) for the site would mean that emission levels approach the safety limit advised by ICNIRP in their guidelines.

Table 1 – Total EQ by frequency band

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	700	0.7131	JT	55	0.003274667	1/ 305
	800	0.9954	JT	39	0.012517812	1/ 80
	900	0.6415	JT	64	0.001802505	1/ 555
	1800	0.1771	JT	329	0.000197004	1/ 5076
	2100	0.2182	JT	280	0.000332754	1/ 3005
	2600	0.06964	JT	876	2.34834E-05	1/ 42583
	3400	0.007476	Sure	5202	3.37027E-06	1/ 296712
				Total Site EQ	0.018151596	1/ 55

[1] Prior to 1 July 2020, the JCRA and the Guernsey Competition & Regulatory Authority coordinated their activities in the Channel Islands as the Channel Islands Competition Regulatory Authorities (CICRA). Earlier reports may refer to CICRA rather than JCRA.

The results show that the total EQ was measured at 1.815 % of ICNIRP's *General Public* Reference Levels (or about 1/55) and the site therefore remains safe.

The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the operator. On each plot, the solid red line represents the Airtel activity, the light blue is JT, the dark blue is Sure, the light grey is Clear (Clear only operates in the 2100MHz band) and the green line is Newtel (Newtel only operates a license in the 3400MHz band). Note however that not all operators are present in each frequency band but the colour assigned to each operator remains the same throughout.

ICNIRP's *General Public* Reference Level is also shown as the dashed line at the top of the graphs. For clarity, each step on the vertical axis represents a 10-fold increase. The same scaling and colour scheme will be used on the plots throughout this report.

The graphs are also supported by the equivalent statistical tables derived from the measured levels at the site for added clarity.

2 Site details

2.1 Site location

Figure 1 – Map of the site area

Site name:	Regal Construction
Site address:	Haut Bois, La Grande Route de St Lawrence
Site latitude:	49.23428
Site longitude:	-2.14009

2.2 Site description

Operators:	JT
Antenna types:	Directional Antennas
Approximate height:	15m
Site type:	Outdoor wall
Description:	The antenna at Regal Construction is located at the rear of the building, out of reach of the public.

2.3 Site photo

Figure 2 – Location of the peak where emission levels were measured.

2.4 Test location

Figure 3 – Survey area with spot measurement markers

As part of the peak search procedure, spot measurements were taken at locations around the antennas as shown on the above sketch.

The blue triangle is the antenna location, yellow lines are the walk route, the green circles are intermediate locations measured at during the peak search and the red circle is the spot where the highest spot search reading was obtained and where the detailed survey was carried out.

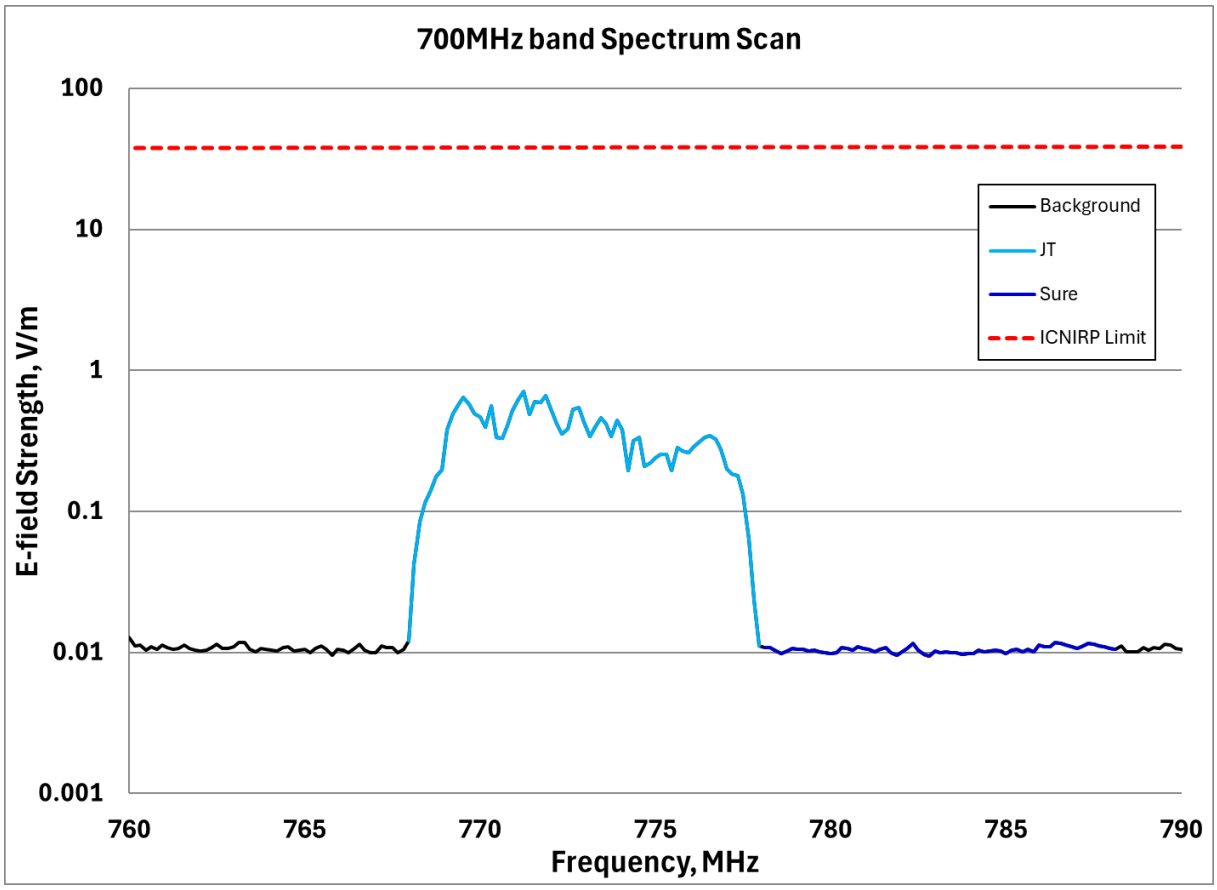
The spectrum readings reported further down this report were recorded over a period of six minutes as advised by ICNIRP.

3 Survey results

3.1 700MHz band

The graph for the 700MHz activity is shown below with the E-field strength levels measured at the site plotted on a logarithmic scale.

Figure 4 – 700MHz band spectrum scan



No field level recorded across the band was higher than 0.7131 V/m (JT), which is 55 times smaller than the ICNIRP Reference Level.

The EQ results for the 700MHz band are shown below.

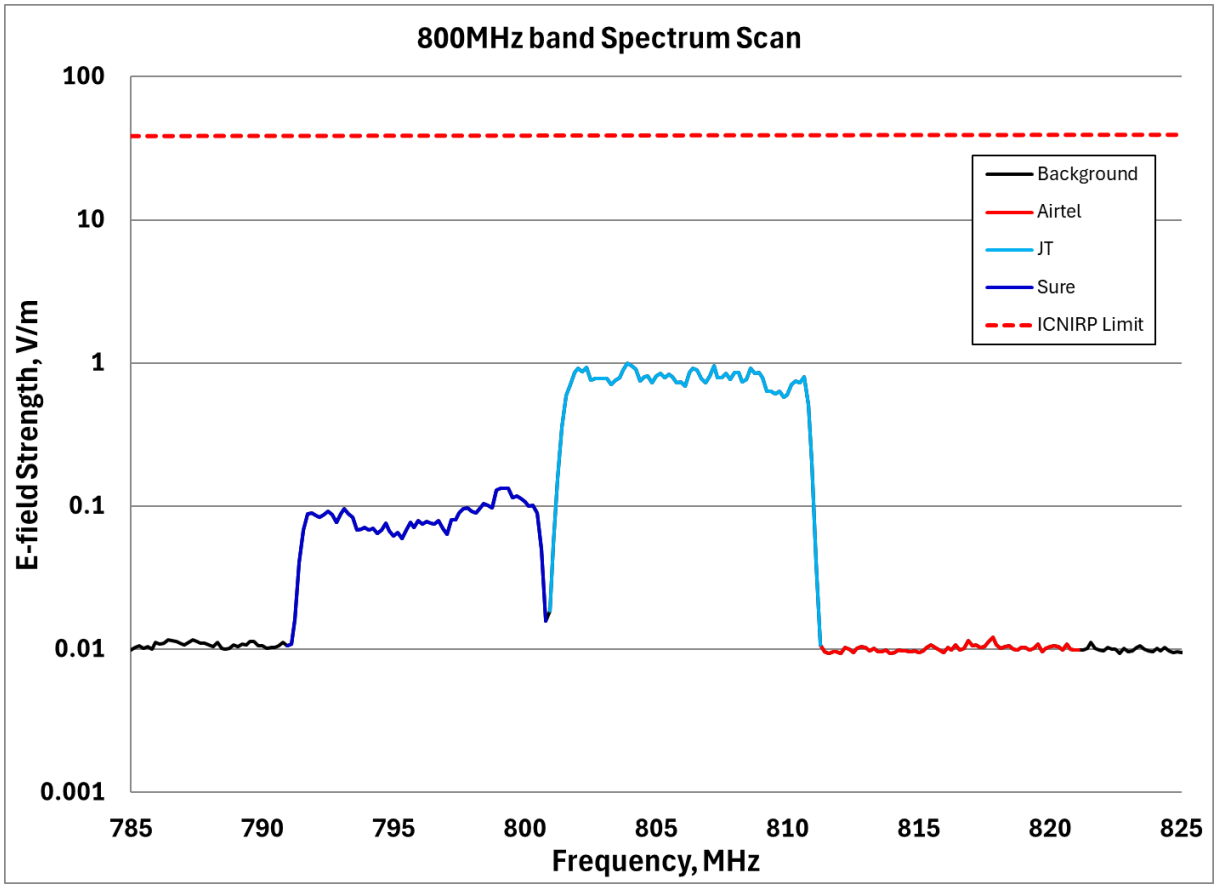
Table 2 – 700MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	JT	700	0.7131	55	0.003272255	1/ 306
	Sure		0.01173	3316	2.41193E-06	1/ 414606
				total band EQ	0.003274667	1/ 305

3.2 800MHz band

The graph for the 800MHz activity is shown below.

Figure 5 – 800MHz band spectrum scan



No field level recorded across the band was higher than 0.9954 V/m (JT), which is 39 times smaller than the ICNIRP Reference Level.

The EQ results for the 800MHz band are shown below.

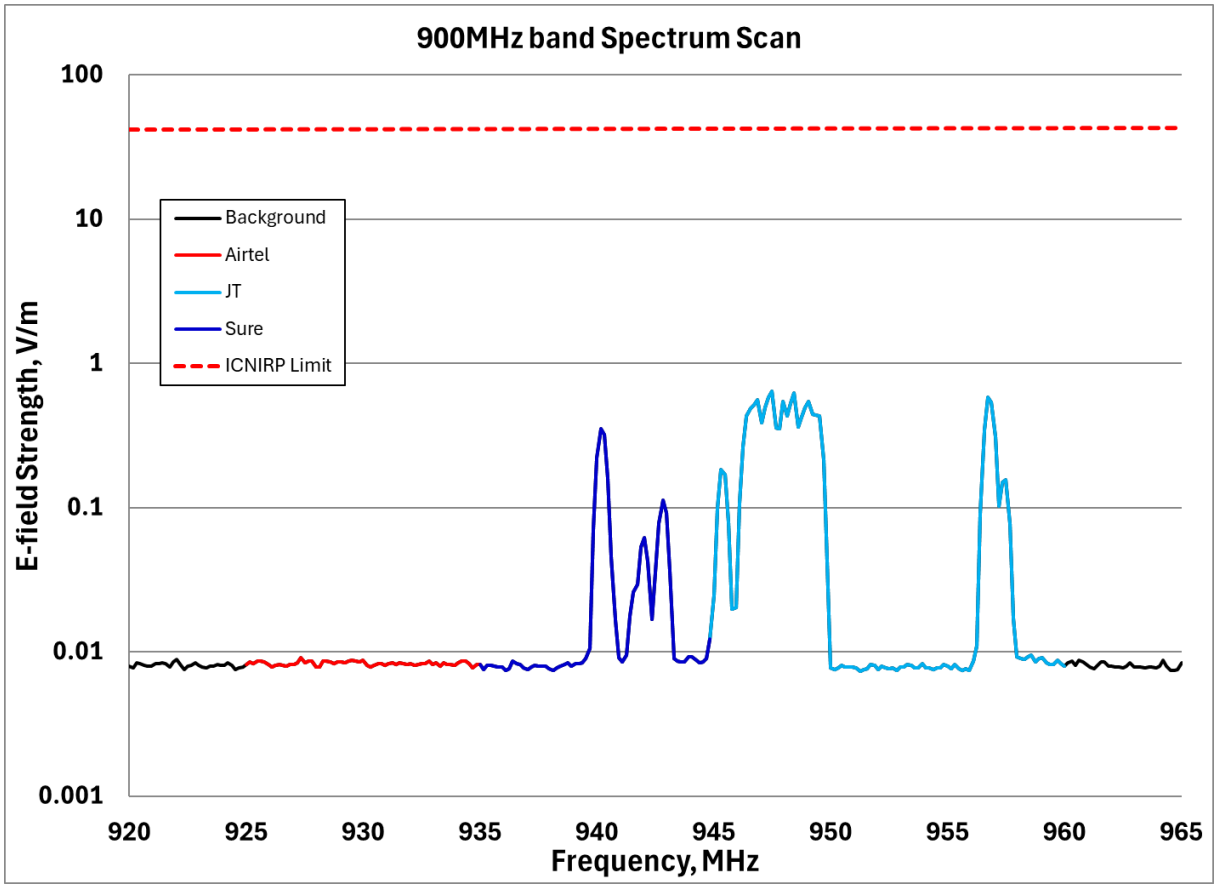
Table 3 – 800MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Airtel	800	0.01209	3217	2.13793E-06	1/ 467742
	JT		0.9954	39	0.012361829	1/ 81
	Sure		0.1338	291	0.000153845	1/ 6500
				total band EQ	0.012517812	1/ 80

3.3 900MHz band

The graph for the 900MHz activity is shown below.

Figure 6 – 900MHz band spectrum scan



No field level recorded across the band was higher than 0.6415 V/m (JT), which is 64 times smaller than the ICNIRP Reference Level.

The EQ results for the 900MHz band are shown below.

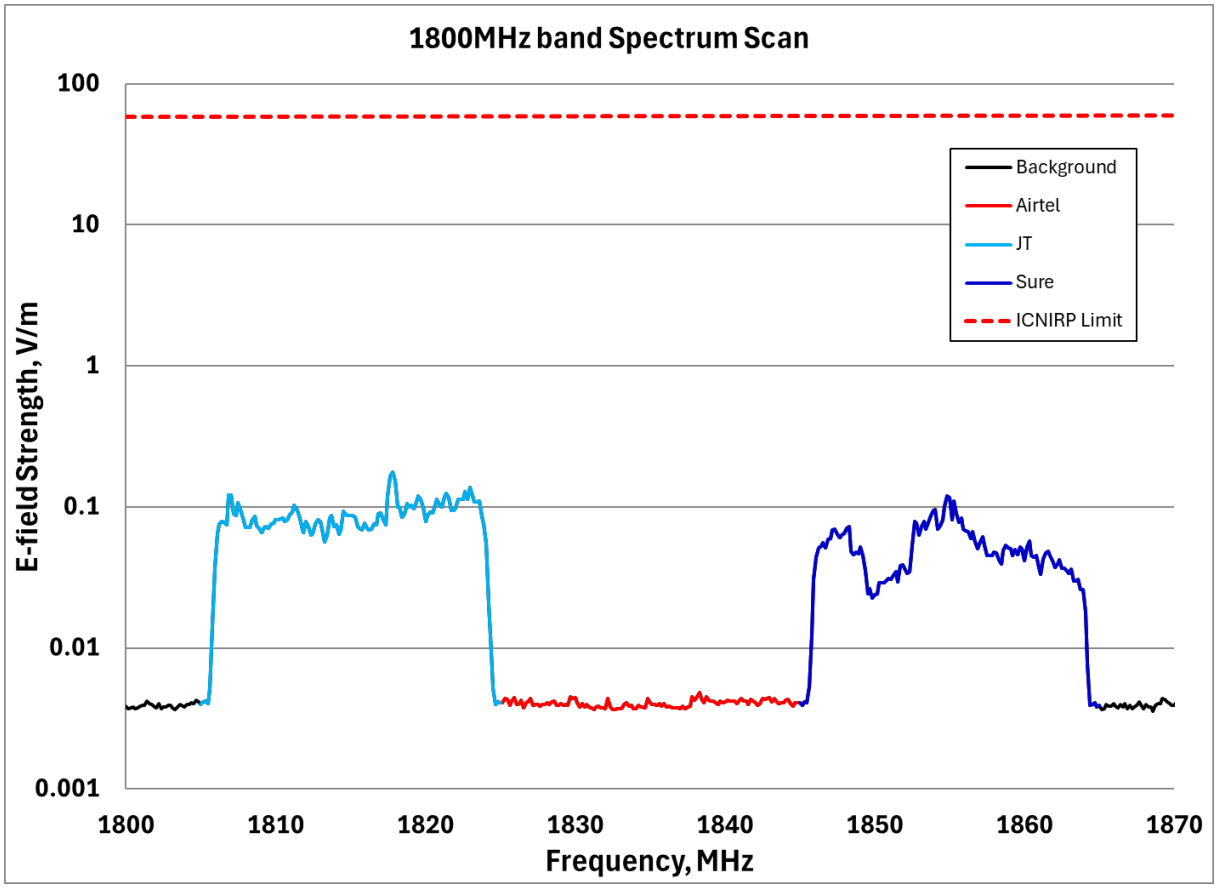
Table 4 – 900MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Airtel	900	0.009073	4546	1.27671E-06	1/ 783264
	JT		0.6415	64	0.001702697	1/ 587
	Sure		0.3506	118	9.85317E-05	1/ 10149
				total band EQ	0.001802505	1/ 555

3.4 1800MHz band

The graph for the 1800MHz activity around the site is shown below.

Figure 7 – 1800MHz spectrum scan



No field level recorded across the band was higher than 0.1771 V/m (JT), which is 329 times smaller than the ICNIRP Reference Level.

The EQ results for the 1800MHz band are shown below.

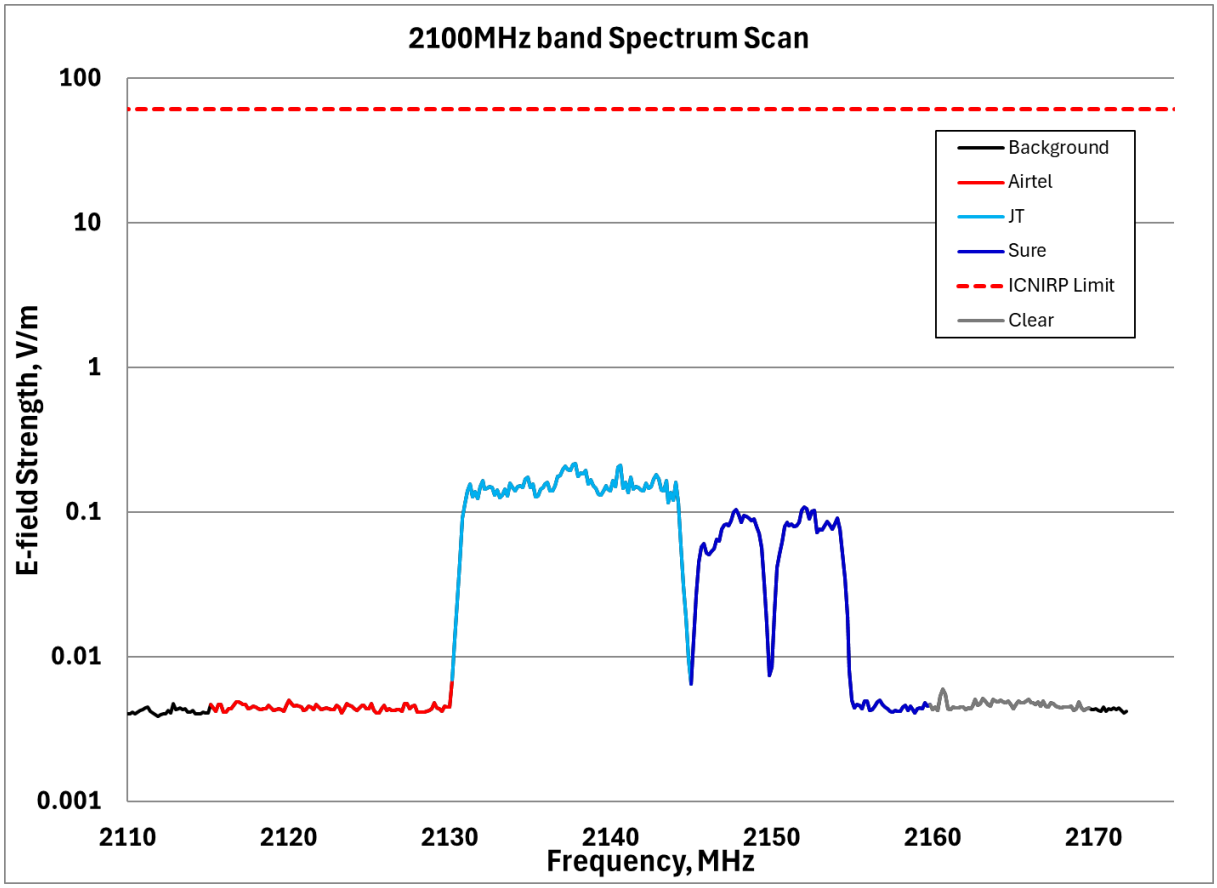
Table 5 – 1800MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Airtel	1800	0.004817	12111	3.05458E-07	1/ 3273773
	JT		0.1771	329	0.000144322	1/ 6929
	Sure		0.1198	487	5.23767E-05	1/ 19092
				total band EQ	0.000197004	1/ 5076

3.5 2100MHz band

The graph for the 2100MHz band activity around the site is shown below.

Figure 8 – 2100MHz band spectrum scan



No field level recorded across the band was higher than 0.2182 V/m (JT), which is 280 times smaller than the ICNIRP Reference Level.

The EQ results for the 2100MHz band are shown below.

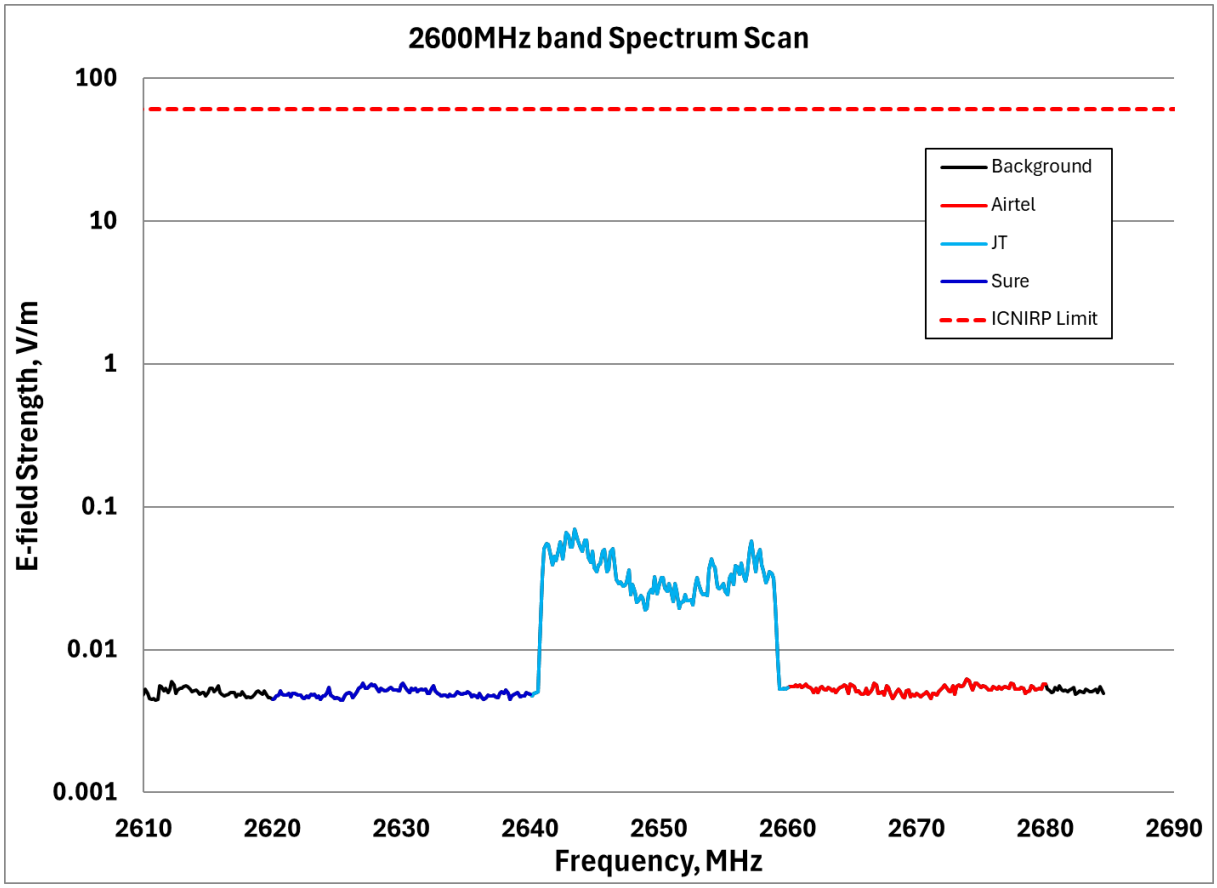
Table 6 – 2100MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Airtel	2100	0.006963	8761	2.61627E-07	1/ 3822229
	Clear		0.005988	10187	1.89467E-07	1/ 5277961
	JT		0.2182	280	0.000285867	1/ 3498
	Sure		0.1088	561	4.64356E-05	1/ 21535
				total band EQ	0.000332754	1/ 3005

3.6 2600MHz band

The graph for the 2600MHz band activity around the site is shown below.

Figure 9 – 2600MHz band spectrum scan



No field level recorded across the band was higher than 0.06964 V/m (JT), which is 876 times smaller than the ICNIRP Reference Level.

The EQ results for the 2600MHz band are shown below.

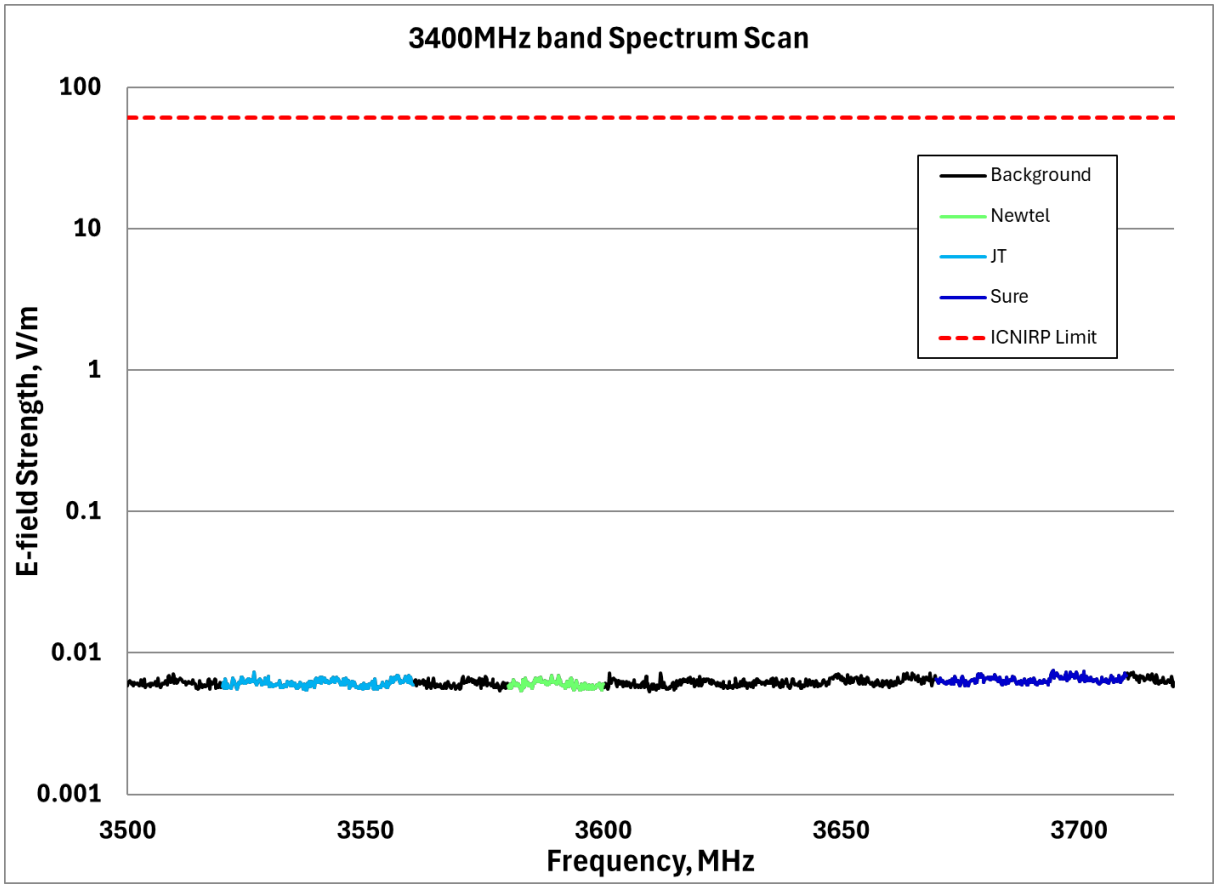
Table 7 – 2600MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Airtel	2600	0.00628	9713	4.89638E-07	1/ 2042323
	JT		0.06964	876	2.25641E-05	1/ 44318
	Sure		0.005864	10402	4.29651E-07	1/ 2327469
				total band EQ	2.34834E-05	1/ 42583

3.7 3400MHz band

The graph for the 3400-3800MHz band activity around the site is shown below.

Figure 10 – 3400MHz band spectrum scan



No meaningful activity was recorded at this site in the 3400MHz band. The EQ results for the band are shown below.

Table 8 – 3400MHz band exposure quotient at Regal Construction

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Regal Construction	Newtel	3400	0.006957	5590	6.27042E-07	1/ 1594788
	JT		0.007274	5347	1.29524E-06	1/ 772056
	Sure		0.007476	5202	1.44798E-06	1/ 690617
				total band EQ	3.37027E-06	1/ 296712

END