Test report

5G Network Trial at 3.5GHz band with indoor small cells at Mita data center test bed, Mongkok & Central Flagship shops

Temporary Permit No. T00655 & T00701

China Mobile Hong Kong Co. Ltd. (CMHK)

May-2020

Version 1.1

1. Introduction

CMHK had conducted 5G network field trial at a few locations since October 2018. Most of the trial was conducted with 5G outdoor radio equipment at the early stage. 5G small cell product at 3.5GHz was available in April 2019, and CMHK started to arrange 3.5GHz small cell trials at a few indoor locations.

This test report will describe the setup and trial result of 5G 3.5GHz small cells (Huawei Lampsites) at Mita data center test bed, Mongkok and Central Flagship shops. The trial period approved in Permit T00655 is from 10-May-2019 to 5-Nov-2019, and the trial period approved in Permit T00701 is from 6-Nov-2019 to 31-Mar-2020.

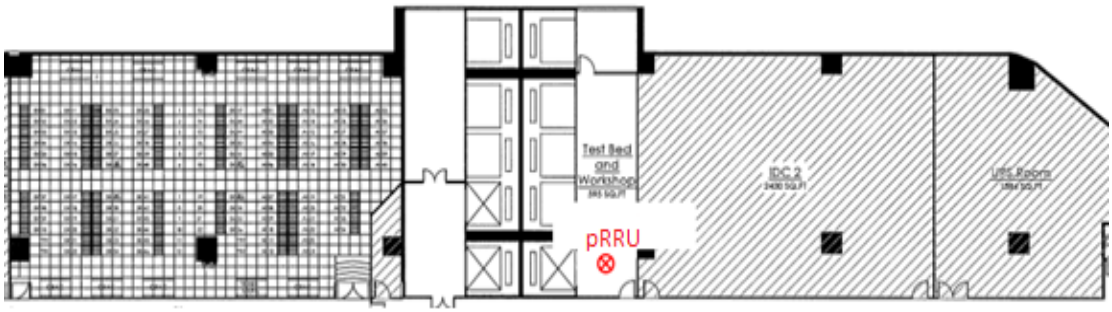
2. Trial Location

Site ID	Site Name	Address	No. of unit
6520	Mita test bed	9/F Mita Center, 552-566 Castle Peak Road, Kwai Chung, New Territories.	1
5206 (existing)	CMHK Mongkok Flagship Shop	G/F, 1/F, 2/F CMHK flagship shop, 1L-1M, Sai Yeung Choi Street South, Mong Kok.	6
6207 (new)	CMHK Central Flagship Shop	G/F & 1/F, CMHK Flagship shop, 54-55 Des Voeus Road, Central	4

The 5G indoor lampsites at 3.5GHz band are installed in these 3 locations with NSA configuration, and the existing 4G sites are used as anchored LTE network.

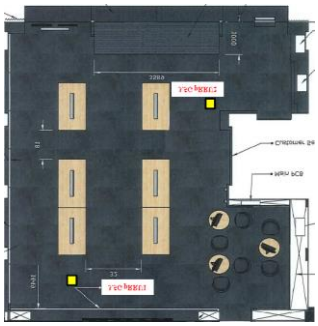
Mita Data Center

9/F:

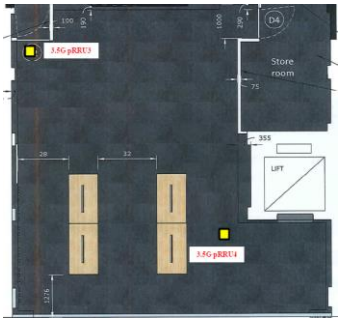


Mongkok Flagship Shop

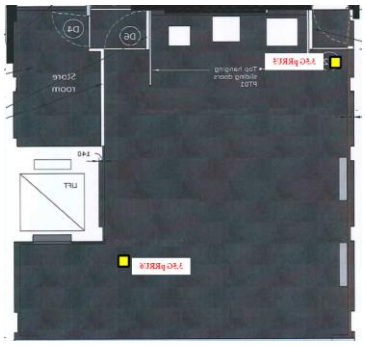
G/F area:



1/F area:

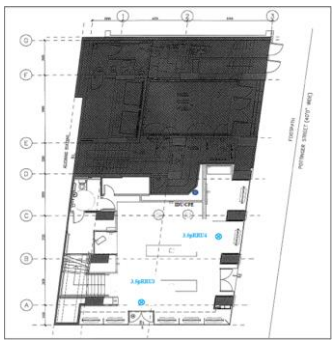


2/F area:

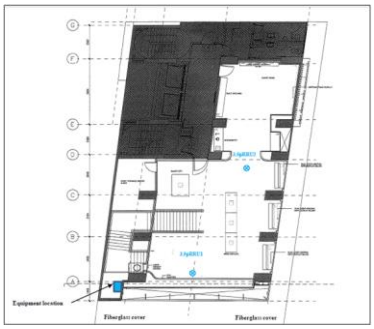


Central Flagship Shop

G/F area:



1/F area：



3. Trial Setup

3.1 Test Equipment

Item	Device	Count
1	5G pRRU5935	1 for Mita 6 for Mongkok 4 for Central
2	5G Samsung S10	1
2	5G Huawei Mate20x	1

Huawei 5G pRRU5935 specification:

Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	IBW (MHz)
3500	3400 - 3600	3400 - 3600	100

Mode	Capacity	Tx/Rx Channel
NR	1 carrier	4T4R

Frequency Band (MHz)	Maximum Output Power (mW)
3500	4x250 mW

Frequency Band (MHz)	Gain (dBi)	Polarization Mode	Directionality
3500	4	Linear	Omnidirectional

3.2 5G Test Equipment Setting

The spectrum approved for trial in permit T00655 is 3.5GHz to 3.6GHz, and was amended to 3.40GHz to 3.46GHz in permit T00701. The test result is based on 100MHz bandwidth setting approved in T00655.

Below is the 5G cell configuration:

Mita data center test bed

Site	Pcell PCI	Type
6520	332	NR

	Cell Configuration
Frequency Band	n78
Downlink NARFCN	636666
Downlink Bandwidth	100MHz
Subcarrier Spacing(KHz)	30
Slot Assignment	4:1
Max Transmit Power (EIRP)	30 dBm

Mongkok Flagship Shop

Site	Pcell PCI	Type
5206	100	NR

	Cell Configuration
Frequency Band	n78
Downlink NARFCN	636666
Downlink Bandwidth	100MHz
Subcarrier Spacing(KHz)	30
Slot Assignment	4:1
Max Transmit Power (EIRP)	30 dBm
ENDC switch	OFF

Central Flagship Shop

Site	Pcell PCI	Type
6207	127	NR

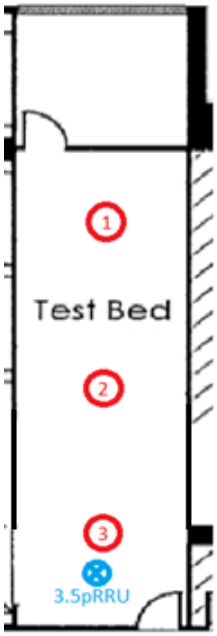
	Cell Configuration
Frequency Band	n78
Downlink NARFCN	636666
Downlink Bandwidth	100MHz
Subcarrier Spacing(KHz)	30
Slot Assignment	4:1
Max Transmit Power (EIRP)	30 dBm

ENDC switch	OFF

4. Measurement Result

Mita data center test bed

3 test positions (highlighted in red) at Mita test bed were measured for coverage and throughput



Test mobile (Mate20x) was used to conduct the measurement by using OFCA speed test APP.

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-76.75	22	924	86.1	10
2	-72.63	21	936	85.1	10
3	-71.25	24	961	87.1	10

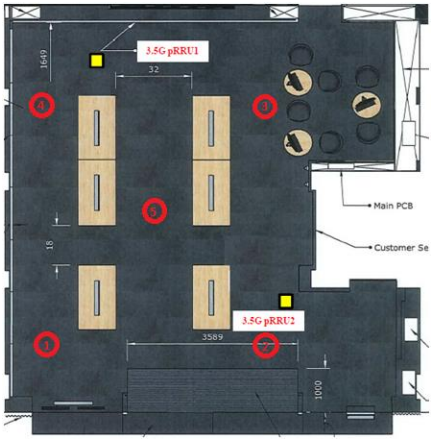
Overall test summary:

Location	Avg RSRP (dBm)	Avg SINR (dB)	Avg Download (Mbps)	Avg Upload (Mbps)
9/F Test Bed	-73.54	22.33	940.33	86.10

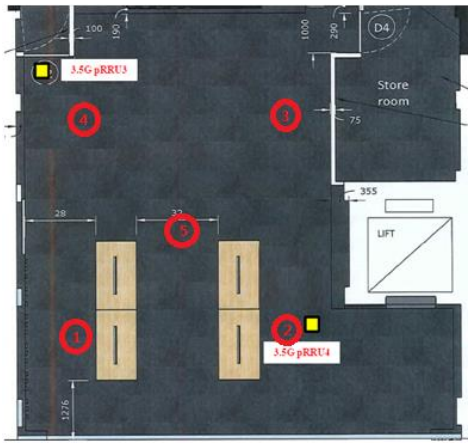
Mongkok Flagship Shop

5 test positions (highlighted in red) at G/F, 1/F & 2/F were measured for coverage and throughput

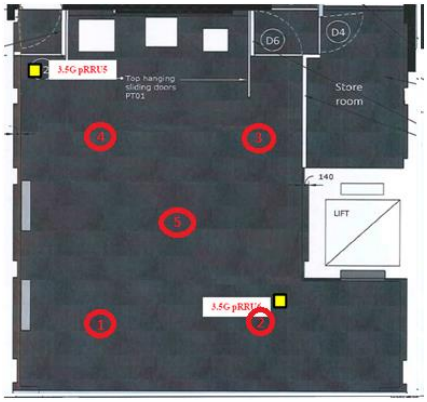
G/F test positions:



1/F test positions:



2/F test positions:



Test mobile (Samsung S10) was used to conduct the measurement by using OFCA speed test APP.

G/F area:

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-76	25	716	72.6	17
2	-77	24	718	72.9	17

3	-77	25	723	71	17
4	-76	26	701	70.4	16
5	-77	23	720	72.9	18

1/F area:

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-74	26	754	69.1	16
2	-73	25	773	72.8	17
3	-76	26	730	72.9	16
4	-78	24	709	72	16
5	-78	26	730	73.9	17

2/F area:

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-79	29	691	71.1	17
2	-74	23	706	74.5	18
3	-74	28	687	74.3	16
4	-76	24	692	74	16
5	-75	25	683	71.1	16

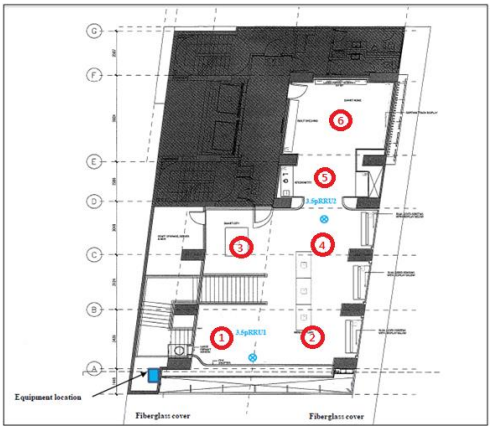
Overall test summary:

Location	Avg RSRP (dBm)	Avg SINR (dB)	Avg Download (Mbps)	Avg Upload (Mbps)
G/F	-76.60	24.6	715.60	71.96
1/F	-75.80	25.4	739.20	72.14
2/F	-75.60	25.8	691.80	73.00

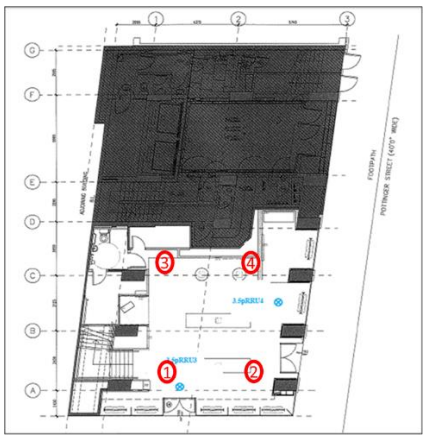
Central Flagship

- 6 test positions (highlighted in red) at 1/F was measured for coverage and throughput
- 4 test positions (highlighted in red) at G/F was measured for coverage and throughput

1/F:



G/F:



Test mobile (Mate20x) was used to conduct the measurement by using OFCA speed test APP.

1/F area:

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-77	31	793	65.2	10
2	-78	30	815	65.6	10
3	-79	30	813	46.3	10
4	-75	32	837	66.1	10
5	-82	28	806	62.1	10
6	-80	29	808	67.4	10

G/F area:

Test position	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
1	-77	31	809	66.2	10
2	-78	30	795	62.6	10
3	-76	31	799	65.4	10
4	-76	32	837	61.6	10

Overall test summary:

Location	Avg RSRP (dBm)	Avg SINR (dB)	Avg Download (Mbps)	Avg Upload (Mbps)
1/F	-78.50	30	812.0	62.12
G/F	-76.75	31	810.0	63.95

5. Conclusion

The 5G indoor sites (lampsites) at 3.5GHz band are successfully deployed and tested at Mita test bed, Mongkok Flagship Shop and Central Flagship Shop. The measurement results verify that the coverage and data throughput of 5G NR are satisfactory in the indoor environment of these 3 locations.