Television Reception Baseline Survey Report

Prepared for:

SES Ltd

Bowmer and Kirkland

Circle Square, Block 9, Manchester

May 2019

For and on behalf of:

Dataflow Network Installations Ltd

Unit 66B Barkston House
Leeds-LS11-9RT
Tel 0113 203881 Fax 0113 2038882 Email Info@dataflow.uk.com
Company Registration - 4932303

Job Reference:	Circle Square B9
Author:	Matt Heslop
Contact via:	matthew@dataflow.uk.com
Prepared for:	Dataflow Network Installations Ltd
Contact:	Matthew Sutherland matthew@dataflow.uk.com
Reviewed by:	Matthew Sutherland Darren Ford Martin Getliffe
Issued:	May 2019

The contents of this report are confidential and may not be disclosed to other parties without express permission from Dataflow.
Copyright @ Dataflow Network Installations LTD 2019

Unit 66B Barkston House

LS11 9RT

Leeds

United Kingdom

1. Introduction

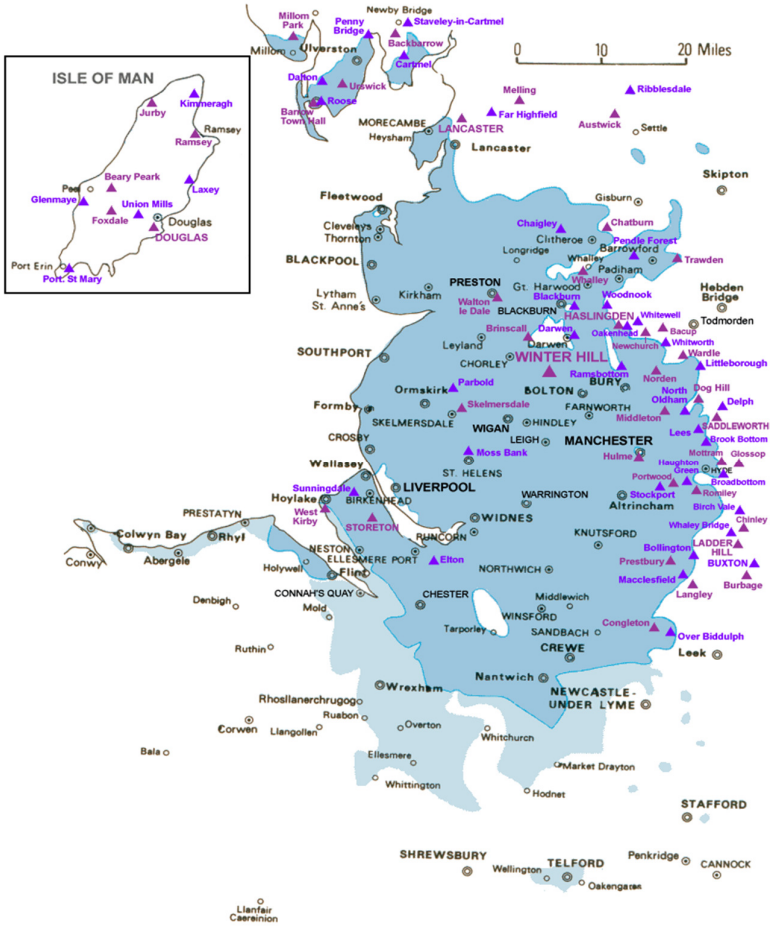
1.1 Overview

This survey report considers the development at Circle Square, Oxford Road, Manchester, specifically Block 9.

This development will introduce significant additional structures to the address area that could adversely affect TV reception in the ‘shadow’ area.

1.2 Relevant Transmitter

A comprehensive search of relevant transmission coverage maps and on site testing identified Winter Hill as the main transmitter covering this area. Winter Hill is one of the UK’s main transmitting stations located approximately 25 KM northwest of the Circle Square development site.
See coverage map below.
Winter Hill provides a full channel list of terrestrial digital TV.



2. Television Transmission, Buildings and Interference

2.1 Technical Overview.

Terrestrial television services are provided by mean of UHF Radio waves propagated from transmitters to receiving aerials which then relay the signals to modulators inbuilt in all TV sets.

The quality of the image and sound are dependent on both the signal strength and any interference strength from secondary sources.

To receive quality reception an aerial must receive a strong carrier signal and weak interference signals.

The two main ways a building can cause interference of signals are described below:

2.2 Obstruction of the Signal.

This is caused by a building physically blocking the transmitted signals, reducing the strength of the carrier in the shadow of the structure.

In this instance, the shadow would project southeast of the development site.
The highest losses will be located closest to the development site.
Losses nearer the edge of the shadow will be less significant due to diffraction of the signals.

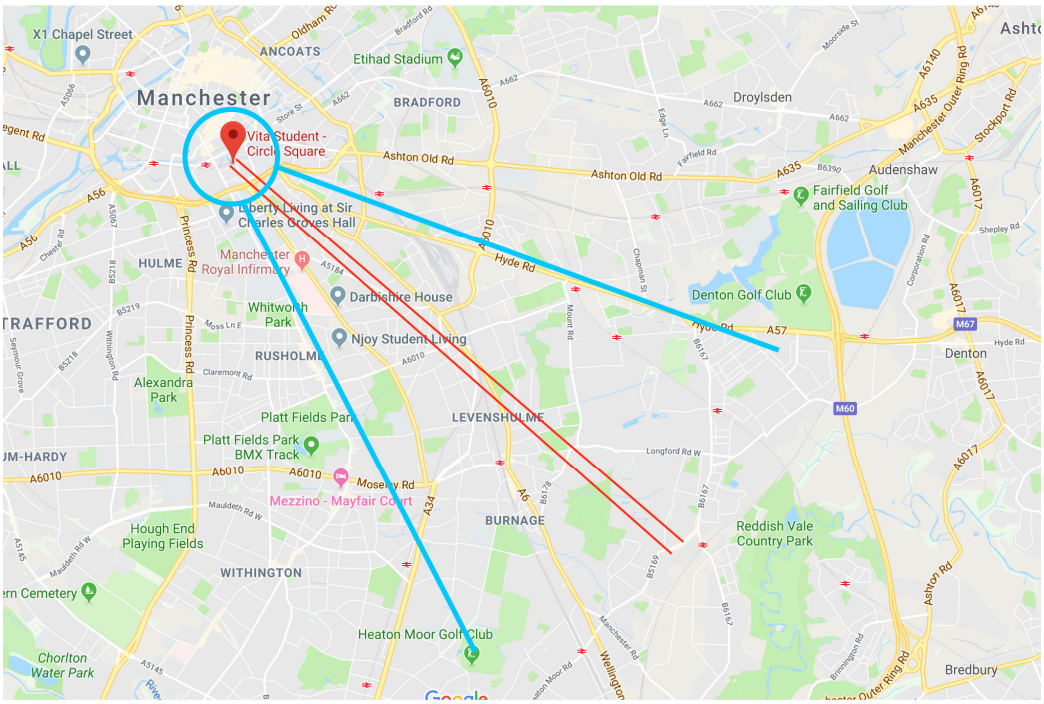
2.3 Reflection of the signal.

Structures with square edges can reflect the transmitted signal. This causes ‘multi-path interference’ whereby the signal is received twice by the aerial at slightly delayed timings. The direct signal arrives first because it has a shorter path; the secondary signal is received via the reflection off the side of the building.
The reflection will be worse if the angle is less than 30 degrees.

Ofcom has published documents offering guidance on this issue.
See attached Ofcom ‘Tall structures and their impact on broadcast and other wireless services’ document for the technical descriptions of the two main causes.

This survey is carried out following the Ofcom guidelines.

2.4 Interference Shadow



This illustrates the shadow zone of the Circle Square development on the surrounding area.
The red lines indicate the possible blocking shadow whereas the blue lines indicate the possible reflection shadow.

2.5 Potential blocking issues.

As illustrated the potential for the blocking out of signals over a densely populated area is great with those situated close to the development being at greater risk.
Baseline test measurements were taken at seven locations within the blocking shadow out to 5.6KM from the development.

2.6 Potential reflection issues.

Reflection effects are most likely if the transmitter doesn't have direct line-of-sight with the receiving aerial. Winter Hill transmitter has radio line-of-site throughout the shadow at 10m height from ground level, therefore reflection issues are very unlikely in this case.

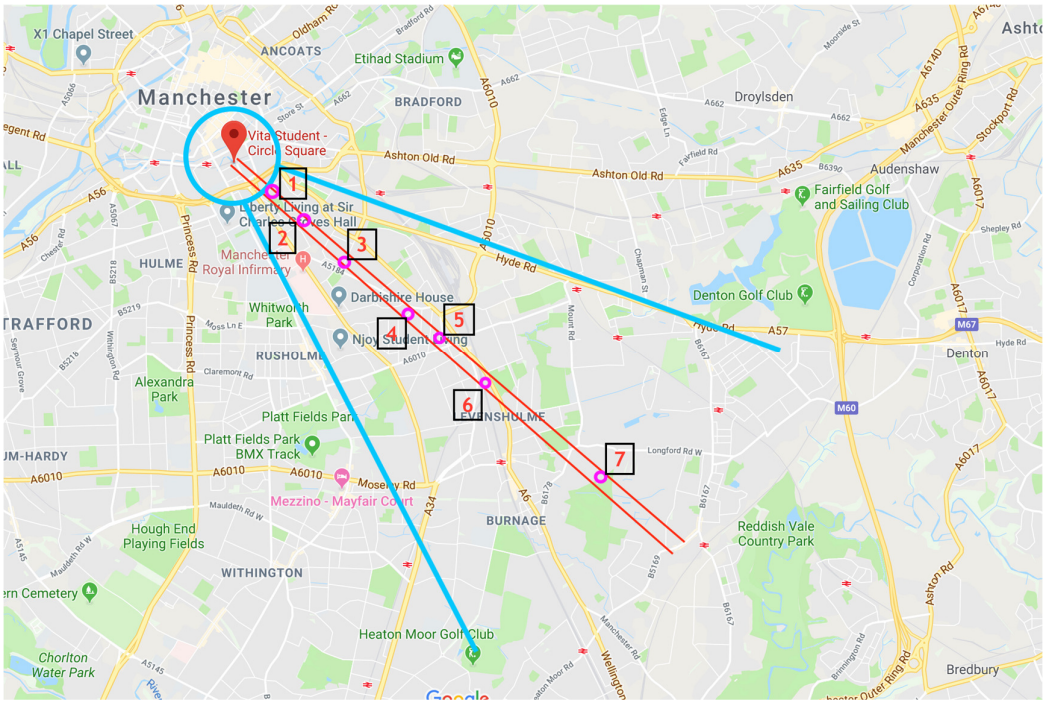
3. Baseline Survey.

This survey is an indicator regarding the likelihood of interference in the area.
If the current signals are good quality there is less likelihood that issues of reception will arise.

Seven locations were chosen as illustrated below.
The full addresses of the locations are within the survey results.
The service survey was carried out on Tuesday 7/5/19 under low atmospheric pressure.

All multiplexes from Winter Hill transmitter were tested for strength (dB), quality (C/N) and Error rate (BER).
A 10m mast and ‘standard’ aerial were used in the tests. This aerial has a forward gain of 10-12 dB and is used as standard.

Each location has a spreadsheet indication the channel numbers for the multiplexes and the results of the signal tests.
Each location has a written conclusion of the results.
Each location was photographed from the aerial position.



4. Mitigation.

If an adverse effect on TV services occurs and it attributed to the development then mitigation will be required.

4.1 Mitigation options

Common options are:

1/ Replacement of existing aerial arrays with more powerful, directional and higher gain aerials.
2/ Repositioning the existing aerial to optimum reception.
3/ Redirecting the aerial to an alternative transmitter.
4/ installations of amplifiers.
5/ A combination of the above.
6/ Replacing aerial arrays with a satellite dish and receiver for the provision of FreeSat TV services.

The most common option taken up is number 6. As this is a satellite reception system it negates the terrestrial shadow altogether.

5. Survey Results

Location 1, Grosvenor Street.
Distance from development 0.6KM

Mixed reception with very low signal levels, some mux's failing.
Signal strengths were low to medium, carrier noise was low to medium.

Visible TV aerials were elevated high on buildings. The majority of domestic buildings have satellite dishes and Virgin Cable TV was in evidence in this location. Probably due to the poor terrestrial reception.

TV services are currently very poor at 10m heights. This is probably caused by the shadow of severalk existing high buildings in the area combining and not just the Block 9 development.

Interference is highly possible in this location.

LOCATION 1	CH	56	50	59	54	58	49	37	55	31
Grosvenor Street	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M1 7EW	Format	D	D	D	HD	D	D	D	HD	HD
0.6KM / 0.4 Miles	dB	39	53	50	48	50	53	54	48	49
	C/N	18	32	31	28	32	34	35	29	29
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		FAIL	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
LEVEL		FAIL	MED	LOW	LOW	LOW	MED	MED	LOW	LOW

LOCATION 2	CH	56	50	59	54	58	49	37	55	31
Brunswick Street	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M13 9SX	Format	D	D	D	HD	D	D	D	HD	HD
1.3KM / 0.8 Miles	dB	53	55	55	55	56	56	64	56	56
	C/N	35	31	37	36	37	34	40	37	38
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
LEVEL		MED	MED	MED	MED	MED	MED	HIGH	MED	MED

Location 2, Brunswick Street.
Distance from development 1.3KM

Overall average reception with medium signal levels and quality, all mux's passed the benchmark.
Signal strengths were medium, carrier noise was medium.

Visible TV aerials were elevated high on buildings, although at 10m heights the signals were serviceable and no apparent major interference was found. However, this location is still close to the development and the surrounding existing high buildings and it is therefore possible that interference could still occur.

LOCATION 3	CH	56	50	59	54	58	49	37	55	31
Swinton Grove	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M13 0EW	Format	D	D	D	HD	D	D	D	HD	HD
2.1KM / 1.3 Miles	dB	39	56	44	44	42	54	47	44	40
	C/N	19	36	25	25	22	34	28	25	21
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		FAIL	PASS	MARG	MARG	MARG	PASS	PASS	MARG	MARG
LEVEL		FAIL	MED	LOW	LOW	LOW	MED	LOW	LOW	LOW

Location 3, Swinton Grove.
Distance from development 2.1KM

Overall signal levels were poor with medium to low levels of reception with some mux's failing and some marginal.

It is possible that signal degradation has occurred at this location due to the development and the other existing high buildings in the locale.

Further degradation of the TV signals is possible for some residences at this location.
However, due to the distance from the development site and the large amount of evidence of other TV sources, i.e.; satellite dishes, this may have been a problem for some time and not solely caused by the development at Block 9.

Significant interference is highly likely at this location.

LOCATION 4	CH	56	50	59	54	58	49	37	55	31
Hathersage Road	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M13 0FE	Format	D	D	D	HD	D	D	D	HD	HD
2.4KM / 1.5 Miles	dB	38	54	44	44	42	54	47	44	40
	C/N	18	35	31	35	32	33	37	29	28
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		FAIL	PASS	PASS	PASS	MARG	PASS	PASS	PASS	MARG
LEVEL		FAIL	MED	LOW	LOW	LOW	MED	LOW	LOW	LOW

Location 4, Hathersage Road.
Distance from development 2.4KM

Overall signal levels were poor with medium to low levels of reception with some mux's failing and some marginal.

It is possible that signal degradation has occurred at this location due to the development and the other existing high buildings in the locale.

Further degradation of the TV signals is possible for some residences at this location.
Aerials were generally high elevation and many looked old and neglected.
Virgin Cable TV was evident in the area, as a]was satellite reception.
However, due to the distance from the development site and the large amount of evidence of other TV sources, i.e.; satellite dishes, this may have been a problem for some time and not solely caused by the development at Block 9.

Significant interference is highly likely at this location.

LOCATION 5	CH	56	50	59	54	58	49	37	55	31
Honor Street	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M13 0FE	Format	D	D	D	HD	D	D	D	HD	HD
3.7KM / 2.3 Miles	dB	43	61	53	52	53	62	63	63	55
	C/N	23	37	33	39	34	35	42	34	35
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		MARG	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
LEVEL		LOW	HIGH	MED	LOW	MED	HIGH	HIGH	HIGH	MED

Location 5, Honor Street.
Distance from development 3.7KM

Overall, signal; levels were acceptable at this location. All mux's passed benchmark.
The local mux containing local and community TV stations has marginal quality but passed nonetheless.

Aerials were of average gain and standard installations.

It is possible that slight and intermittent interference may occur in this area but due to the distance from the development it would be simple to rectify any problems with a high gain aerial or a taller mast.

LOCATION 6	CH	56	50	59	54	58	49	37	55	31
Slade Lane	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M13 0GN	Format	D	D	D	HD	D	D	D	HD	HD
4.3KM / 2.7 Miles	dB	47	59	48	55	43	60	60	49	54
	C/N	23	35	28	35	34	40	38	31	35
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
LEVEL		LOW	MED	LOW	MED	LOW	MED	MED	LOW	MED

Location 6, Slade Lane.
Distance from development 4.3KM

Overall signal levels low to medium quality although all mux's passed benchmark form 10m height.

Aerials were of average gain and standard installations.

It is possible that slight and occasional interference may occur in this area but due to the distance from the development it would be simple to rectify any problems with a high gain aerial or a taller mast.
Any interference at this location could also be caused by a local 4G transmitter.

It is unlikely that any degradation and interference could be caused by the development.

LOCATION 7	CH	56	50	59	54	58	49	37	55	31
Crayfield Road	Service	LOCAL	BBC A	D3&4	BBC B	SDN	ARQ A	ARQB	COM7	COM8
M19 2UB	Format	D	D	D	HD	D	D	D	HD	HD
5.6KM / 3.5 Miles	dB	52	73	66	70	67	73	70	64	62
	C/N	34	38	40	38	36	36	40	38	35
	BER	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8	1-8
Signal Quality		PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
LEVEL		MED	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH

Location 7, Crayfield Road.
Distance from development 5.6KM

Overall signal levels and quality were good and displayed excellent reception.

Any disruption or interference eat this location is considered very unlikely.

6. Survey conclusion

In summary, there is little evidence that Block 9 has contributed to the degradation of the signal levels in its shadow.
The observations in this survey show that the development of this part of Manchester city centre has been ongoing for some years and there are many existing large buildings that will be causing the interference and degradation of terrestrial TV signals in the area.
The residents within the affected shadow area appear to have worked around the ongoing problem of living close to built-up city centres by choosing other methods than terrestrial reception for their TV access.

7. Evidence Photos



Location 1



Location 2



Location 3



Location 4



Location 5



location 6



location 7