



Pre-Construction
Signal Reception Impact Survey

Phoenix Works, Manchester

20th October 2020

THIS TELEVISION RECEPTION SURVEY HAS BEEN CARRIED OUT ON BEHALF OF:

DeTrafford Estates Group
Barrington House
Heyes Lane
Alderley Edge
SK9 7LA

NAME OF THE DEVELOPMENT:

Phoenix Works
Ellesmere Street
Manchester

PLANNING APPLICATION NUMBER:

TBA

THIS TV RECEPTION SURVEY WAS CARRIED OUT BY:

Astbury / Global Security Systems (NW) Limited
Unit 10A Harcourt Industrial Estate
Harcourt Street
Walkden
Manchester
M28 3GN

DATE OF SURVEY:

20th October 2020

SURVEY METHODOLOGY

- During the period of testing, the vehicle will be parked in a safe & legal location, ensuring that no obstruction to the highway and pedestrians is caused.
- After carrying out a dynamic risk assessment of the location, the test equipment will be erected and signals readings taken.
- Signal measurements will be taken at pre-selected locations in the area surrounding the development.
- Results will be recorded regarding all signals including strength and quality.
- Where more than one transmitter is receivable, signals will be recorded and submitted as part of the report.

The survey is carried out using the following equipment:-

- Blake SR10 10 Element Wideband UHF Antenna (CAI Approved / Benchmarked). This is the typical type of aerial that would be present on the majority of properties in the area tested.
- Omni-Directional FM Antenna. This is the typical type of aerial that would be present on the majority of properties in the area tested.
- Single Element DAB Antenna. This is the typical type of aerial that would be present on the majority of properties in the area tested.
- 15m x WF100 Twin Screened Coaxial Cable (CAI Approved / Benchmarked). This type of cable is typical of the type of cables that would be present in the majority of properties in the area tested.
- Promax Explorer Digital Spectrum Analyser with monitor for both Audio and Video
- Vehicle mounted 12m Fibreglass Telescopic Mast

INTERFERENCE & REFLECTIONS

Signal quality can be affected in two distinct and different ways. The first is by 'obstruction' where the proposed development creates a shadow area behind the structure where the television signals are effectively 'blocked' to varying degrees depending on the distance away from the proposed development.

Television signals do not create such a 'hard' shadow as visible light, and for the purposes of explanation, a 'shadow' zone must be considered which is divided into three sub-zones.

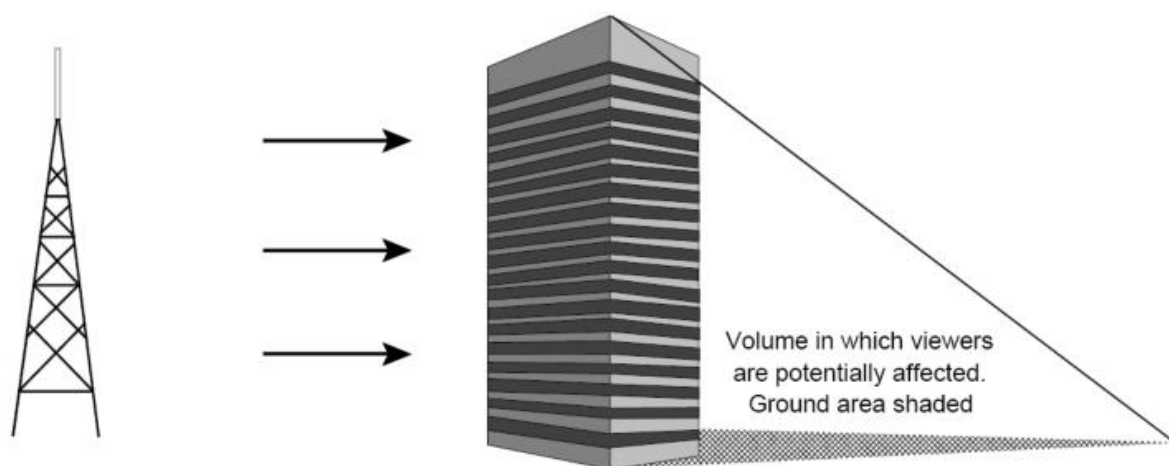
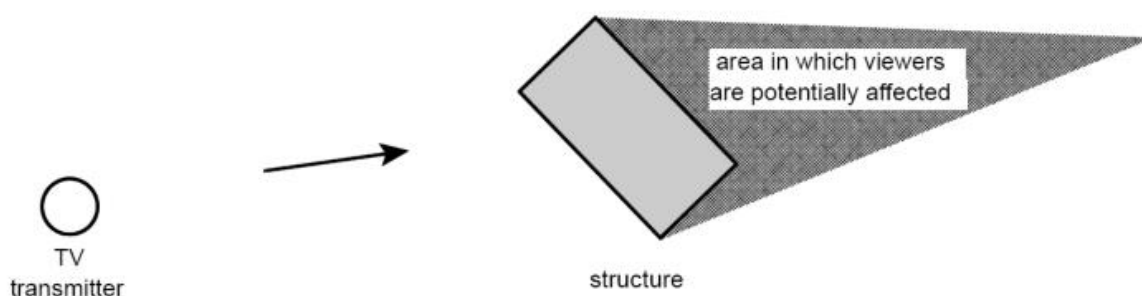


Figure 2 - Affected area in the 'shadow' zone behind the structure



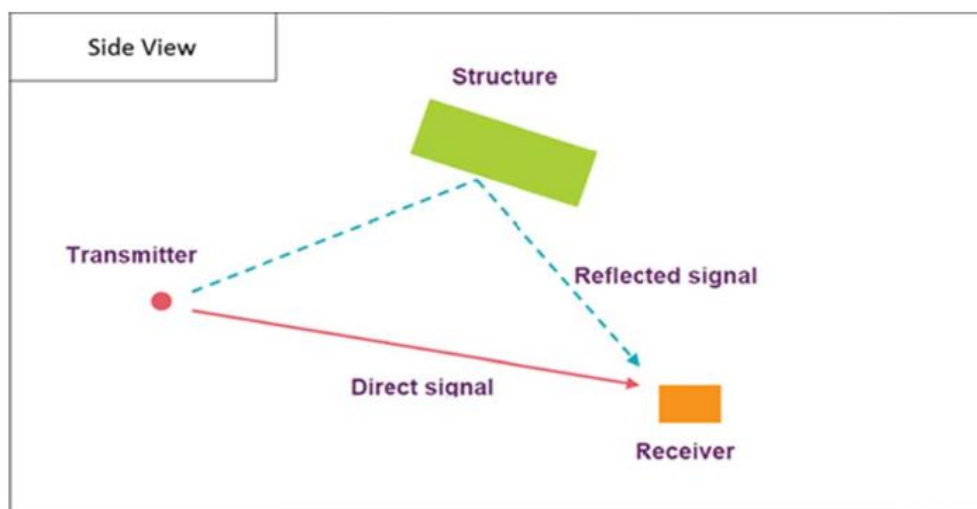
Within a few tens of metres from a solid structure, over the region where optical view of the transmitter is lost, the reduction in signal strength is critically dependent on the specific design and composition of the structure. For most brick and concrete buildings, the reduction is severe and in some cases almost total.

Further away from the structure (e.g. beyond 250 metres, but this varies depending on its size) the limit of the 'shadow' zone and signal reduction are determined by diffraction at the edges of the structure and reflection off surrounding structures. The simple condition of whether or not a location has an optical view of the transmitter is not enough to classify the potential interference zone adequately. In general, the effect is that the signal appears to bend around the sides of the structure; the shadow zone reduces in size and the signal strength is reduced by much less than simple ray optics would suggest.

Even further away from the structure (e.g. 5 km) complex multiple reflections and diffraction, caused by structures in the locality, may result in the 'shadow' zone becoming almost non-existent, against interfering signals that arrive on significantly different bearings. This can result in an increase in the ratio of wanted to unwanted signal as presented to the television receiver.

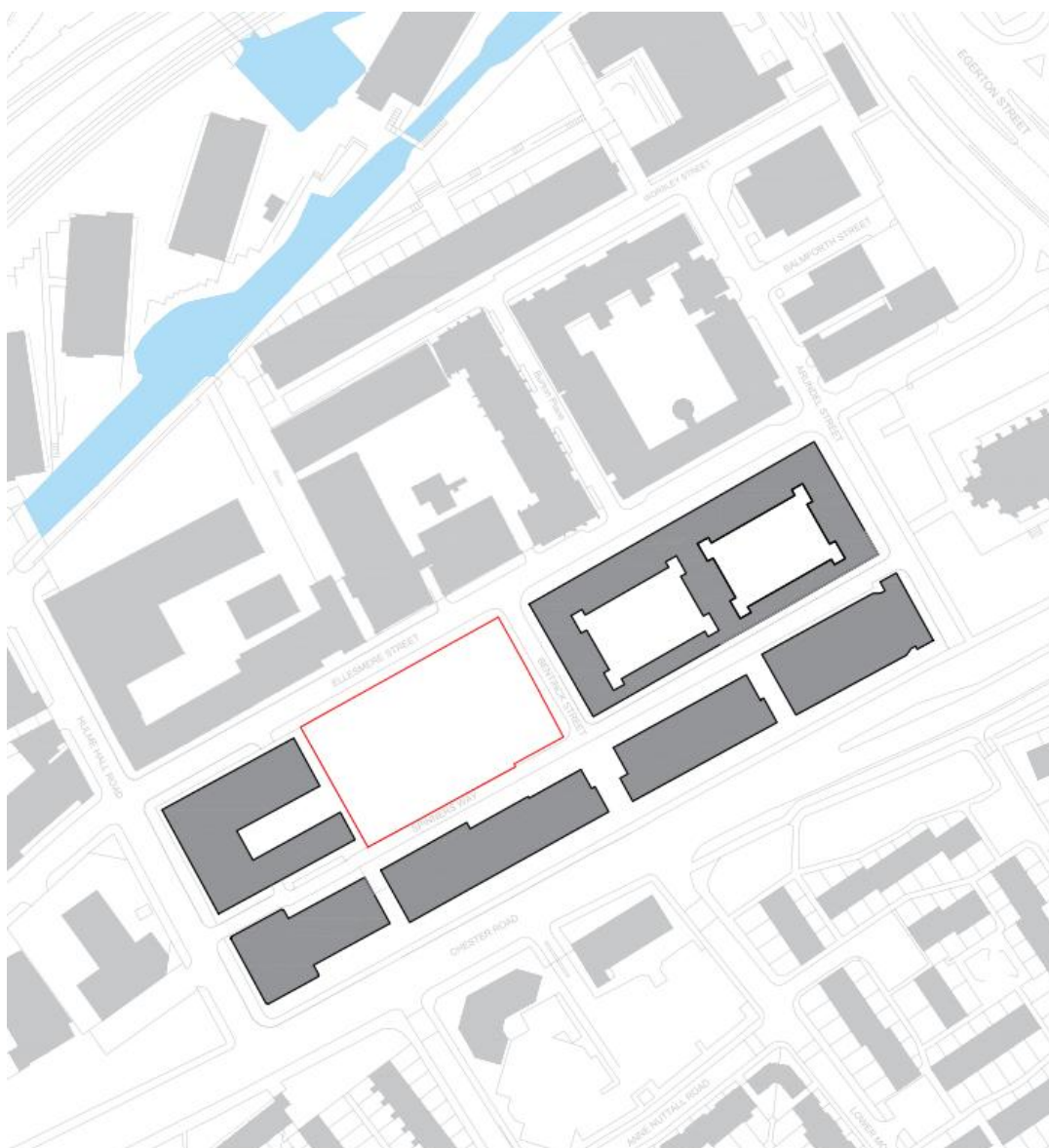
Larger developments with straight edges can reflect signals. This causes multipath interference which, with analogue signals, can manifest itself on the viewed images as 'ghosting'. The 'direct' signal arrives first (Shorter distance to travel) with the reflecting signals arriving, in a weaker state, causing the multiple image effect.

The images below (Taken from OFCOM) illustrate this:



DEVELOPMENT SITE PLAN

**Phoenix Works
Ellesmere Street
Manchester**



BASELINE SURVEY

The purpose of this baseline survey is to establish current television signal strength in the shadow zone of the proposed development. This along with GPS logged signal test locations allows a before and after comparison to be made in the event that complaints of poor reception following the completion of the proposed development.

The signal strength of the television signals was measured and can be categorised as follows:

Average Signal Strength (dB)	Strength Definition
<35	Low
35-45	Average
45-55	Good
55+	Excellent

TELEVISION TRANSMITTER SERVING THIS AREA

WINTER HILL TRANSMITTER

- TRANSMITTER No: 103.00
- NGR: SD 660144
- AERIAL HEIGHT: 718m AOD
- Approximate bearing from the Proposed Development: 132.49 Degrees
- Approximate distance from the Proposed Development: 23.83 Kilometres

TELEVISION BROADCASTS FROM THE WINTER HILL TRANSMITTER

Digital Multiplexes tested:

- RF Channel 29 (538.00 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 31 (554.00 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 32 (562.00 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 34 (578.00 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 35 (585.80 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 37 (602.00 MHZ) Transmission Power @ 100,000 Watts
- RF Channel 56 (754.00 MHZ) Transmission Power @ 1,000 Watts
- RF Channel 57 (762.00 MHZ) Transmission Power @ 1,000 Watts
- RF Channel 55 (746.00 MHZ) Transmission Power @ 25,700 Watts

RADIO BROADCASTS FROM THE WINTER HILL TRANSMITTER

Analogue Frequencies tested:

• BBC Radio 2	(89.3 MHZ)	Transmission Power @ 2,000 Watts
• BBC Radio 3	(91.5 MHZ)	Transmission Power @ 2,000 Watts
• BBC Radio 4	(93.7 MHZ)	Transmission Power @ 2,000 Watts
• Rock FM	(97.4 MHZ)	Transmission Power @ 1,000 Watts
• BBC Radio 1	(98.9 MHZ)	Transmission Power @ 2,000 Watts
• Smooth Radio	(100.4 MHZ)	Transmission Power @ 2,500 Watts
• BBC Radio Lancs	(103.9 MHZ)	Transmission Power @ 2,500 Watts
• Real Radio	(105.4 MHZ)	Transmission Power @ 2,500 Watts

Digital Multiplexes tested:

• Manchester 11C (218.64 MHZ)	Transmission Power @ 760 Watts
• D1 National 11D (222.064 MHZ)	Transmission Power @ 10,000 Watts
• BBC National DAB 12B (225.648 MHZ)	Transmission Power @ 10,000 Watts

SIGNAL MEASUREMENT POSITIONS

To ensure the validity of the supplied results the Pre-Construction signal readings have been recorded so that the same locations can be tested Post-Construction, as indicated below.



Astbury TV Aerials Limited (T/A Astbury)

Unit 6, Charlestown Industrial Estate
Robinson Street, Ashton-under-Lyne
Lancashire. OL6 8NS
0161 330 5700

Registered in England & Wales: 980805

service@astbury.co.uk
www.astbury.co.uk

Measurement Location No. 1

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 2 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	13° C
Relative Humidity (%)	89%
Date	20th October 2020
Time	09:15
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'14" N / 2°15'38"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBμV/m)
BBC Radio 2	89.3	48.1
BBC Radio 3	91.5	53.4
BBC Radio 4	93.7	62.0
Rock FM	97.4	49.0
BBC Radio 1	98.9	53.2
Smooth Radio	100.4	47.8
BBC Radio Lancs	103.9	26.2
Real Radio	105.4	43.6

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBμV/m)
11C	218.64 MHz	11.3
11D	222.064 MHz	50.4
12B	225.648 MHz	48.4

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBμV/m)	35.1	37.4	41.5	39.4	37.8	38.5	36.8	30.2	35.5

Measurement Location No. 2

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 2 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	14° C
Relative Humidity (%)	87%
Date	20th October 2020
Time	09:40
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'11" N / 2°15'35"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBμV/m)
BBC Radio 2	89.3	53.2
BBC Radio 3	91.5	65.0
BBC Radio 4	93.7	57.1
Rock FM	97.4	62.6
BBC Radio 1	98.9	68.3
Smooth Radio	100.4	45.2
BBC Radio Lancs	103.9	24.3
Real Radio	105.4	33.9

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBμV/m)
11C	218.64 MHz	27.2
11D	222.064 MHz	65.5
12B	225.648 MHz	62.8

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBμV/m)	27.4	29.4	33.8	29.1	34.3	34.2	32.5	32.9	30.5

Measurement Location No. 3

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 2 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	14° C
Relative Humidity (%)	88%
Date	20th October 2020
Time	10:05
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'10" N / 2°15'33"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBμV/m)
BBC Radio 2	89.3	52.3
BBC Radio 3	91.5	39.6
BBC Radio 4	93.7	61.3
Rock FM	97.4	49.4
BBC Radio 1	98.9	60.0
Smooth Radio	100.4	32.1
BBC Radio Lancs	103.9	16.5
Real Radio	105.4	36.4

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBμV/m)
11C	218.64 MHz	5.7
11D	222.064 MHz	46.0
12B	225.648 MHz	44.7

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBμV/m)	44.4	41.5	45.3	41.2	43.9	42.7	38.9	29.7	31.2

Measurement Location No. 4

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 2 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	14° C
Relative Humidity (%)	86%
Date	20th October 2020
Time	10:15
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'9" N / 2°15'31"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBμV/m)
BBC Radio 2	89.3	56.6
BBC Radio 3	91.5	64.8
BBC Radio 4	93.7	58.5
Rock FM	97.4	36.6
BBC Radio 1	98.9	52.3
Smooth Radio	100.4	26.4
BBC Radio Lancs	103.9	15.0
Real Radio	105.4	34.3

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBμV/m)
11C	218.64 MHz	5.5
11D	222.064 MHz	49.9
12B	225.648 MHz	52.0

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBμV/m)	39.8	36.2	34.1	41.9	41.8	34.8	36.2	35.1	34.0

Measurement Location No. 5

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 3 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	16° C
Relative Humidity (%)	84%
Date	20th October 2020
Time	10:35
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'5" N / 2°15'26"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBµV/m)
BBC Radio 2	89.3	60.5
BBC Radio 3	91.5	60.5
BBC Radio 4	93.7	60.5
Rock FM	97.4	60.3
BBC Radio 1	98.9	57.5
Smooth Radio	100.4	57.5
BBC Radio Lancs	103.9	22.1
Real Radio	105.4	33.8

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBµV/m)
11C	218.64 MHz	10.4
11D	222.064 MHz	51.0
12B	225.648 MHz	49.8

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBµV/m)	39.8	39.7	37.6	38.0	39.3	30.4	29.9	28.0	28.1

Measurement Location No. 6

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 2 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	16° C
Relative Humidity (%)	80%
Date	20th October 2020
Time	10:55
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'4" N / 2°15'25"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBμV/m)
BBC Radio 2	89.3	60.8
BBC Radio 3	91.5	57.5
BBC Radio 4	93.7	62.4
Rock FM	97.4	61.2
BBC Radio 1	98.9	52.9
Smooth Radio	100.4	44.6
BBC Radio Lancs	103.9	25.1
Real Radio	105.4	43.5

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBμV/m)
11C	218.64 MHz	9.5
11D	222.064 MHz	55.0
12B	225.648 MHz	49.1

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBμV/m)	49.7	47.8	48.9	48.4	48.8	45.2	47.9	51.0	46.8

Measurement Location No. 7

TYPICAL PROPERTY TYPE AT TEST LOCATION

Residential – 3 Storey

Antennae Position and Environmental Conditions

Temperature (°C)	16° C
Relative Humidity (%)	79%
Date	20th October 2020
Time	11:20
DAB & VHF Antenna Height	2m AGL
UHF Antenna Height	10m AGL
OS Grid Reference (x,y)	53°28'1" N / 2°15'21"W

Analogue (FM) Radio Transmissions From Winter Hill Transmitter

Channel	Frequency (MHz)	Field Strength (dBµV/m)
BBC Radio 2	89.3	55.8
BBC Radio 3	91.5	56.1
BBC Radio 4	93.7	60.2
Rock FM	97.4	57.1
BBC Radio 1	98.9	58.4
Smooth Radio	100.4	43.9
BBC Radio Lancs	103.9	24.1
Real Radio	105.4	40.4

Digital (DAB) Radio Transmissions From Winter Hill Transmitter

DAB Block	Frequency (MHz)	Field Strength (dBµV/m)
11C	218.64 MHz	3.7
11D	222.064 MHz	53.2
12B	225.648 MHz	60.9

Digital Terrestrial Television from Winter Hill Transmitter

UHF Channel Allocation	29	31	32	34	35	37	56	55	57
Frequency (MHz)	538	554	562	578	585.8	602	754	746	762
Multiplex	COM4	COM5 COM8	PSB1	PSB2	PSB3	COM6	LM LL LPR	COM7	GIM
Field Strength (dBµV/m)	52.9	50.3	50.2	50.1	44.4	48.1	36.8	34.8	38.1

SIGNAL IMPACT AND MITIGATION

It is our considered opinion, with regard to the existing properties sited adjacent to the proposed development and in the local area that any additional signal degradation will be negligible. This is primarily due to the multitude of high rise developments in the city centre, many of which have only been constructed in the last 5 years. Furthermore, digital signal strength in this area is generally strong enough to overcome any attenuation caused by the proposed development. The vast majority of properties also have access to Cable TV (Virgin Media), and Satellite (Sky / Freesat) which are totally unaffected by the proposed development

It is also worth noting that experience tells us that the use of building cranes and other objects may have a temporary detrimental effect on the received signals during the construction phase of building projects, and this site will be no exception. This effect may be exacerbated particularly during the day whilst the construction site is 'active' with cranes constantly moving. These effects may be more pronounced due to the high number of simultaneous developments in the local area.

If any permanent degradation of TV signals is experienced upon completion of the new build, mitigation will be necessary. Common mitigation measures can include, but not limited to:

- Replacement of receiving aerial with a more directional or higher gain aerial.
- Repositioning the receiving aerial so that the received signal is stronger.
- Directing the receiving aerial to an alternative transmitter that covers the area and retuning the television accordingly.
- Upgrading antenna cabling and connections.
- Installation of signal amplifiers.
- Development of a bespoke local solution using a receiving aerial some distance from the dwelling.
- A combination of the above.
- Replacing terrestrial reception equipment with satellite reception equipment or cable.

In the unlikely event of any properties suffering signal issues following the completion of the development, we are available to call to site and confirm this by carrying out further tests at the existing locations to compare results and / or carry out any remedial

Chris Threadgold

Chris Threadgold
Astbury / Global