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Terrestrial Television Baseline Survey Report

RGRE Ltd, ID Manchester Ltd, & University of Manchester

Plot H, Sister

October 2025







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Job Reference:	14521A2
Author:	Phillip Charhill
[redacted]	
Reviewed By:	Cameron Sabouni; Abdul Wadud
[redacted]	

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Stour Valley Business Centre, Sudbury, Suffolk, CO10 7GB

T:+44 (0)1787 319001 E:info@pagerpower.com W:www.pagerpower.com

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EXECUTIVE SUMMARY

Report Purpose

Pager Power has been commissioned to investigate the potential impact upon terrestrial television reception in the surrounding area of a proposed development at Plot H, Sister, in Manchester. This report serves as a baseline to establish current terrestrial television signal strength and reception quality along with a prediction of the expected impact.

The site is located in Manchester City Centre and is bounded by Charles Street (south), the Manchester South Junction and Altrincham Railway Viaduct and Granby Row (north), Sackville Street (east), and Princess Street (west).

Findings

- A baseline site survey was undertaken on the 10th of September 2025 to record the baseline terrestrial television signal strength and quality. The site survey also confirmed that the Winter Hill transmitter is the main transmitter serving the area surrounding the proposed development;
- The average terrestrial signal strength is very good in the development shadow zone for the main multiplexes and moderate for the local (lower power) multiplexes;
- Negative effects upon signal strength are typically limited to within 1km of the development and within its shadow zone based on Pager Power's industry experience;
- Multistorey dwellings and commercial properties are predominately located within 1km of the development. The signal strength within this range was recorded as good for the main multiplexes, and low for the local multiplexes. A reduction in signal strength is considered unlikely; however, effects cannot be entirely ruled out considering the baseline signal strength, particularly for local multiplexes;
- Any interference would be due to shadowing effects i.e. the weakening of the transmitted signal due to the physical presence of the buildings;
- At locations beyond 1km and within the shadow zone, the signal strength was on average very good for the main multiplexes, and moderate for the local multiplexes. Effects at this range are likely to be relatively small based on previous experience.

Mitigation

No requirement for pre-emptive mitigation has been identified.

In the event that effects are reported, it is recommended that a reception measurement is undertaken (post-construction) to investigate the likely cause of the interference.

Mitigation measures should be installed if reported effects are found to be attributable to the development. Solutions are likely to be readily available if required, the most common options are presented in Section 6.

LIST OF CONTENTS

Administration Page 2
Executive Summary 3
Report Purpose 3
Findings 3
Mitigation 3
List of Contents 4
List of Figures 6
List of Tables 6
1 Background 8
1.1 Introduction 8
1.2 Proposed Development Site Plan and Location 8
1.3 Elevation Diagrams 9
1.4 3D Building Visualisation 9
2 Television Transmitter Details 11
2.1 Relevant Transmitter 11
2.2 Winter Hill Main Transmitter 11
3 Buildings and Television Interference 12
3.1 Technical Overview 12
3.2 Interference mechanisms 12
4 Technical Assessment 16
4.1 Potential Interference Areas 16
4.2 Potential Diffraction Issues 17
4.3 Potential Reflection Issues 17
5 Television Baseline Survey 19
5.1 Overview 19
5.2 Survey Locations 20
5.3 Survey Results 21
6 Mitigation 26

6.1 Mitigation Requirement 26
6.2 Recommended Options 26
6.3 Recommended Process 26
7 Conclusions 27
7.1 Findings 27
7.2 Mitigation 27
Appendix A – Detailed Survey Results 28
Location 1 28
Location 2 29
Location 3 30
Location 4 31
Location 5 32
Location 6 33
Location 7 34
Location 8 35
Appendix B – Survey Photographs 36
Location 1 36
Location 2 37
Location 3 38
Location 4 39
Location 5 40
Location 6 41
Location 7 42
Location 8 43

LIST OF FIGURES

Figure 1 Proposed development site layout plan 8
Figure 2 Proposed development general elevation plan 9
Figure 3 3D building visualisation 10
Figure 4 Diffraction loss zones 13
Figure 5 Reflection zones 14
Figure 6 Interference areas 16
Figure 7 Interference zones map 17
Figure 8 Survey locations 20

LIST OF TABLES

Table 1 Winter Hill main transmissions 11
Table 2 Winter Hill additional transmissions 11
Table 3 Signal strength categories 19
Table 4 Television baseline survey results 25

ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 63 countries within Europe, Africa, America, Asia and Oceania.

The company comprises a team of experts to provide technical expertise and guidance on a range of planning issues for large and small developments.

Pager Power was established in 1997. Initially the company focus was on modelling the impact of wind turbines on radar systems. Over the years, the company has expanded into numerous fields including:

- Renewable energy projects;
- Building developments;
- Aviation and telecommunication systems.

Pager Power prides itself on providing comprehensive, understandable and accurate assessments of complex issues in line with national and international standards. This is underpinned by its custom software, longstanding relationships with stakeholders and active role in conferences and research efforts around the world.

Pager Power's assessments withstand legal scrutiny and the company can provide support for a project at any stage.

1 BACKGROUND

1.1 Introduction

Pager Power has been commissioned to investigate the potential impact upon terrestrial television reception in the surrounding area of a proposed building development in Manchester. This report serves as a baseline to establish current terrestrial television signal strength and reception quality along with a prediction of the expected impact.

The proposed development at Plot H, Sister, is located in Manchester City Centre and is bounded by Charles Street (south), the Manchester South Junction and Altrincham Railway Viaduct and Granby Row (north), Sackville Street (east), and Princess Street (west).

1.2 Proposed Development Site Plan and Location

The proposed development consists of three tower blocks, referenced as "T1", "T2", and "T3", as labelled in Figure 2. The site layout plan[1] is shown in Figure 1 below.



Figure 1 *Proposed development site layout plan*

The three blocks have the following maximum heights:

- T1 – 8 storeys at 62.25m above mean sea level (amsl);
- T2 – 10 storeys at 67.95m amsl;
- T3 – 38 storeys at 148.75m amsl.

[1] Source: 0667-HOD-XX-01-DR-A-(--)201-GA Plan - Level 01.pdf

1.3 Elevation Diagrams

The general elevation plan[2] for the proposed development shown in Figure 2 below, tower blocks are also labelled as described on the previous page.

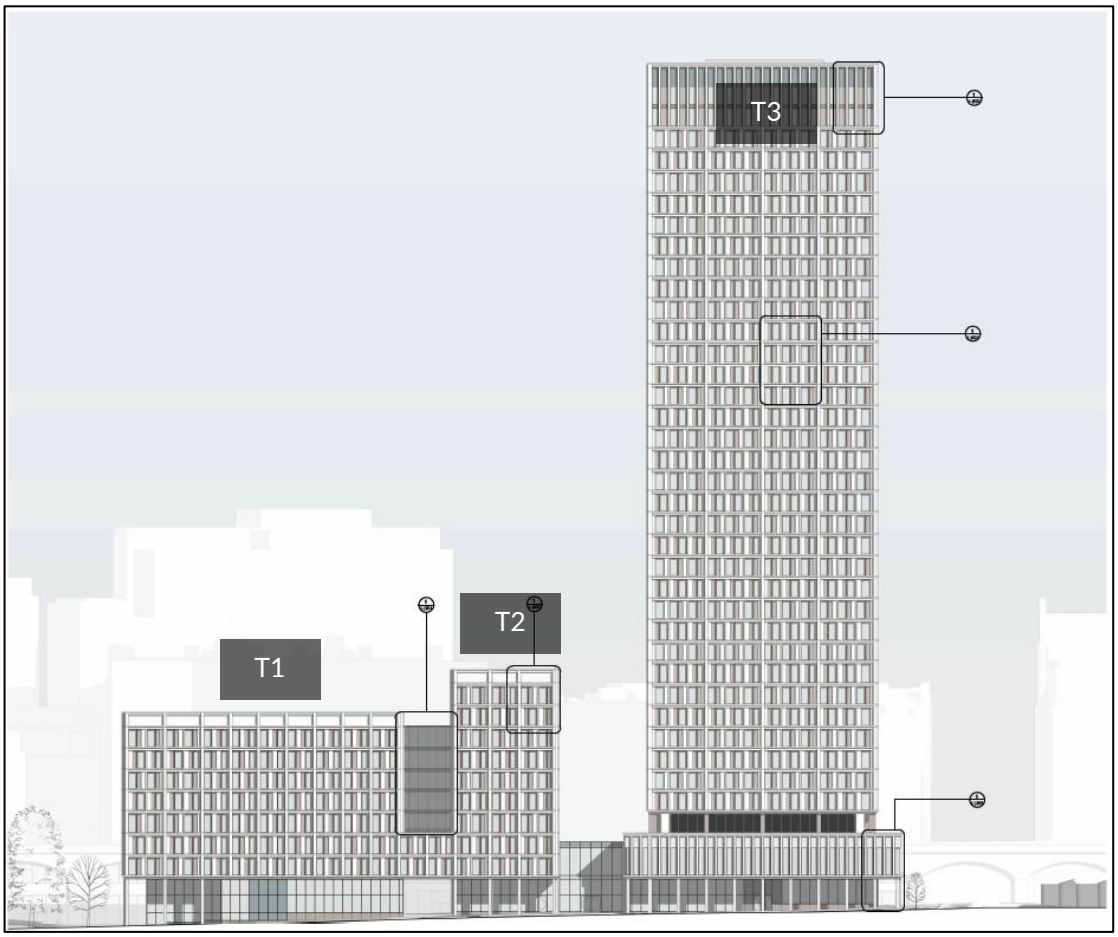


Figure 2 *Proposed development general elevation plan*

1.4 3D Building Visualisation

The coordinates for the tower blocks have been extrapolated from the site drawing and are presented in Appendix A.

A representative 3D visualisation of the proposed development is shown in Figure 3 on the following page.

[2] Source: 0667-HOD-XX-ZZ-DR-A-(--)302-South Elevation.pdf

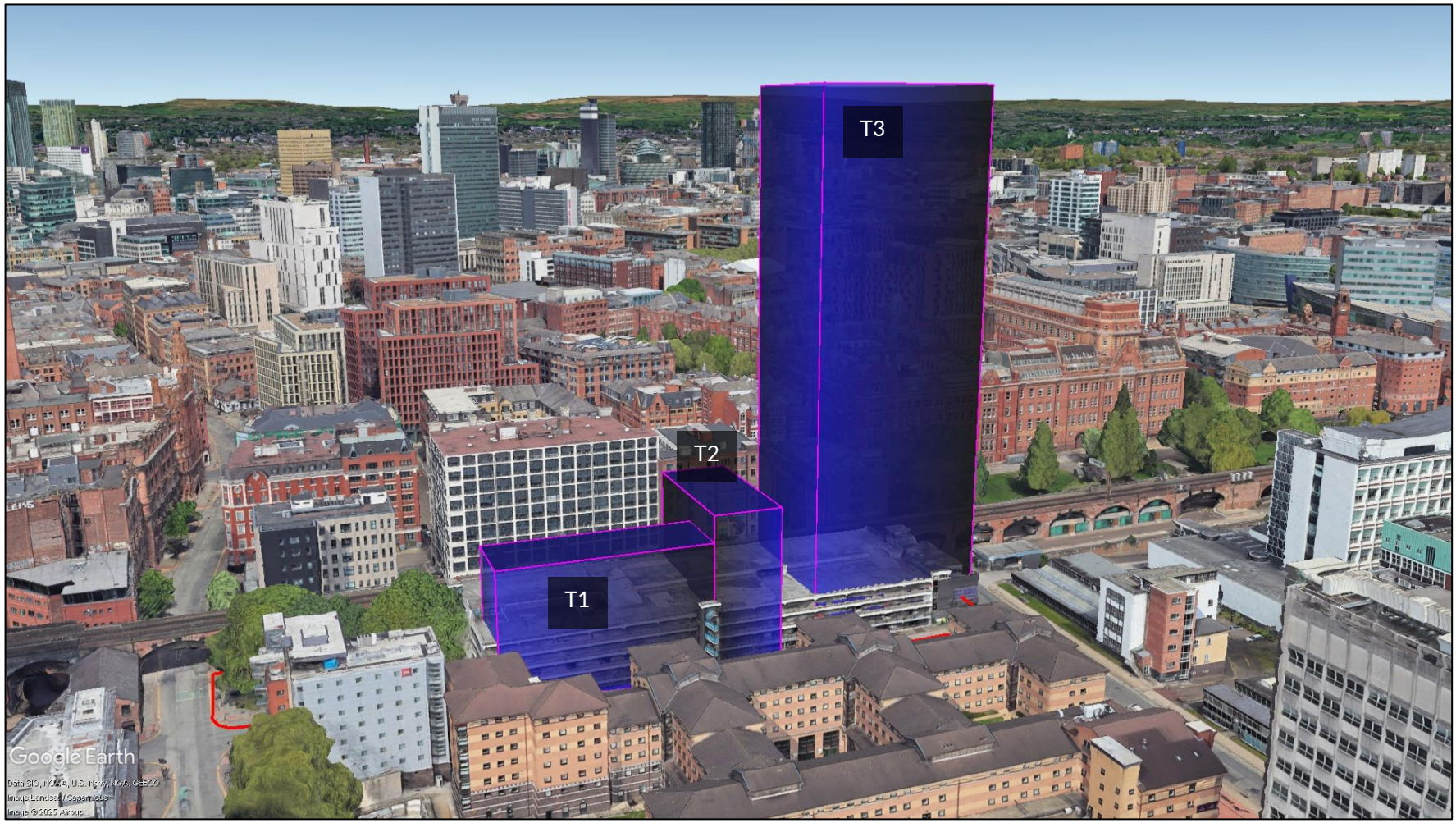


Figure 3 *3D building visualisation*

2 TELEVISION TRANSMITTER DETAILS

2.1 Relevant Transmitter

Winter Hill is one of the UK's main television transmitters located approximately 25km northwest of the development. The Winter Hill transmitter serves the area around the development.

Digital television services are broadcast via Ultra High Frequency (UHF) signals; no analogue television signals are broadcast. The transmitter information is presented below[3].

2.2 Winter Hill Main Transmitter

The main Winter Hill television transmissions are shown in Table 1 below.

	Public (PSB)			Commercial (COM)		
Service	BBC A	Digital 3&4	BBC B	SDN	Arqiva A	Arqiva B
Channel	32	34	35	29	31	37
Power	100 kilo-Watts (kW)					

Table 1 *Winter Hill main transmissions*

Local Winter Hill television transmissions provided in Manchester are shown in Table 2 below.

	Local Multiplexes	
Service	LTVmux	Glmux
Channel	24	27
Power	2 kW	1 kW

Table 2 *Winter Hill additional transmissions*

[3] Source: Ofcom

3 BUILDINGS AND TELEVISION INTERFERENCE

3.1 Technical Overview

Terrestrial television services are provided by means of UHF radio waves which propagate from transmitters to receiving aerials which then relay the signal to a television set.

The quality of the image and sound on a television set is dependent on both the strength of the signal received directly from the transmitter (carrier signal) and the strength of any interference signals from other sources.

To achieve good quality reception an aerial must receive a strong carrier signal but weak interference signals.

3.2 Interference mechanisms

There are two ways that buildings can cause interference to television reception, these are described below.

3.2.1 Obstruction of the Signal

This is caused by the building physically blocking the transmitted television signal, reducing the strength of the carrier signal in the shadow of the building. In the case of Winter Hill transmissions, this would affect residences to the southeast of the development. Specifically:

- The highest losses (greatest interference) will be located immediately behind the building;
- Losses near the edge of the shadow zone will be less significant due to diffraction effects (bending of the signal).

The Ofcom document states that:

"In general, there will be three 'zones' behind the structure:

Zone A - close behind the structure (typically a few tens of metres) there may be a large reduction in signal level with a possible complete loss of reception

Zone B - further away (typically a few hundred metres) the signal reduction is less severe and the shadow will be smaller as diffraction effects partially fill in the shadow. Depending on the size of the structure, some locations could still lose reception completely

Zone C - some distance away (1-5km) the shadow will effectively have disappeared."

The zones mentioned are illustrated in Figure 4 on the following page[4], taken from Section 3.2 of an Ofcom paper[5] regarding the impact of buildings on broadcast signals.

[4] Source: Ofcom (2009): Tall Structures and their impact on broadcast and other wireless services.
[5] Reference as above.

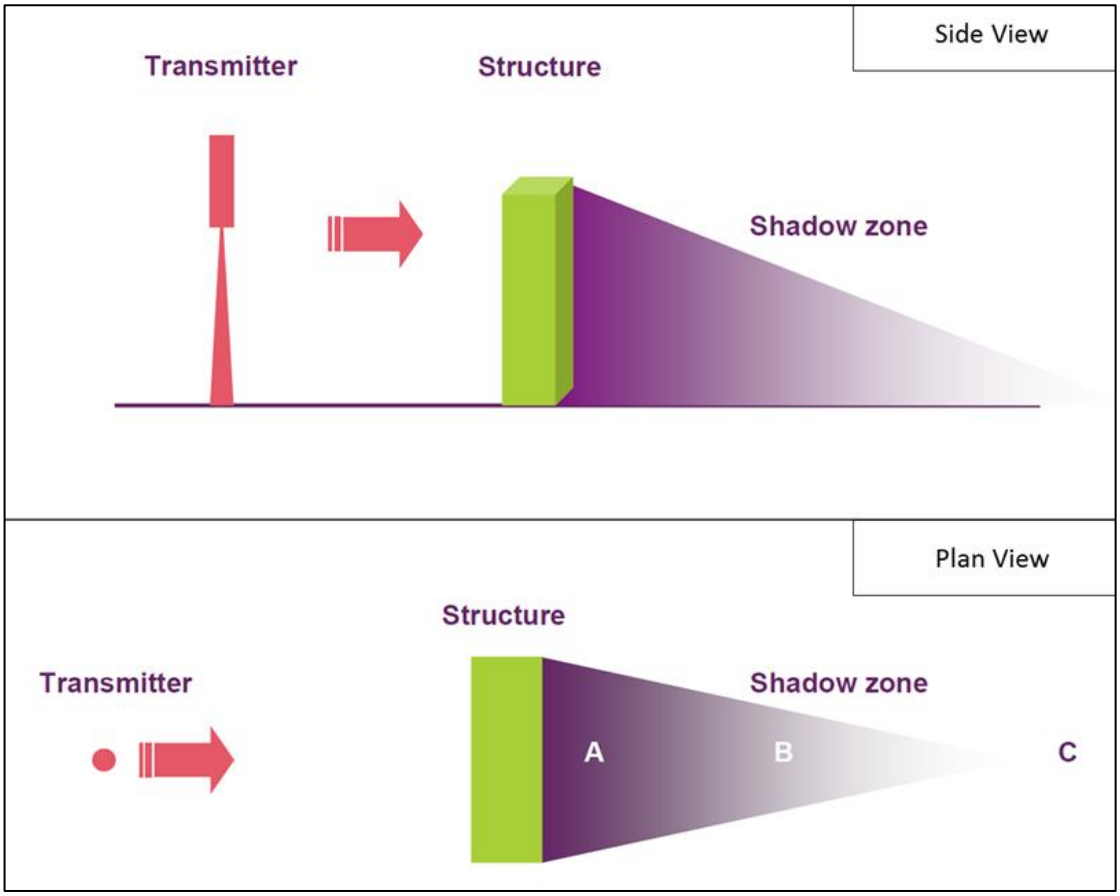


Figure 4 *Diffraction loss zones*

3.2.2 Reflection of the Signal

For large developments with straight edges, the transmitted signal can be reflected by the building itself. This causes an effect known as 'multipath interference' whereby the signal is received twice by an aerial at different times. The direct signal arrives first because it has a shorter distance to travel.

Figure 5 on the following page (taken from Section 3.3 of the Ofcom document referenced above) illustrates this effect.

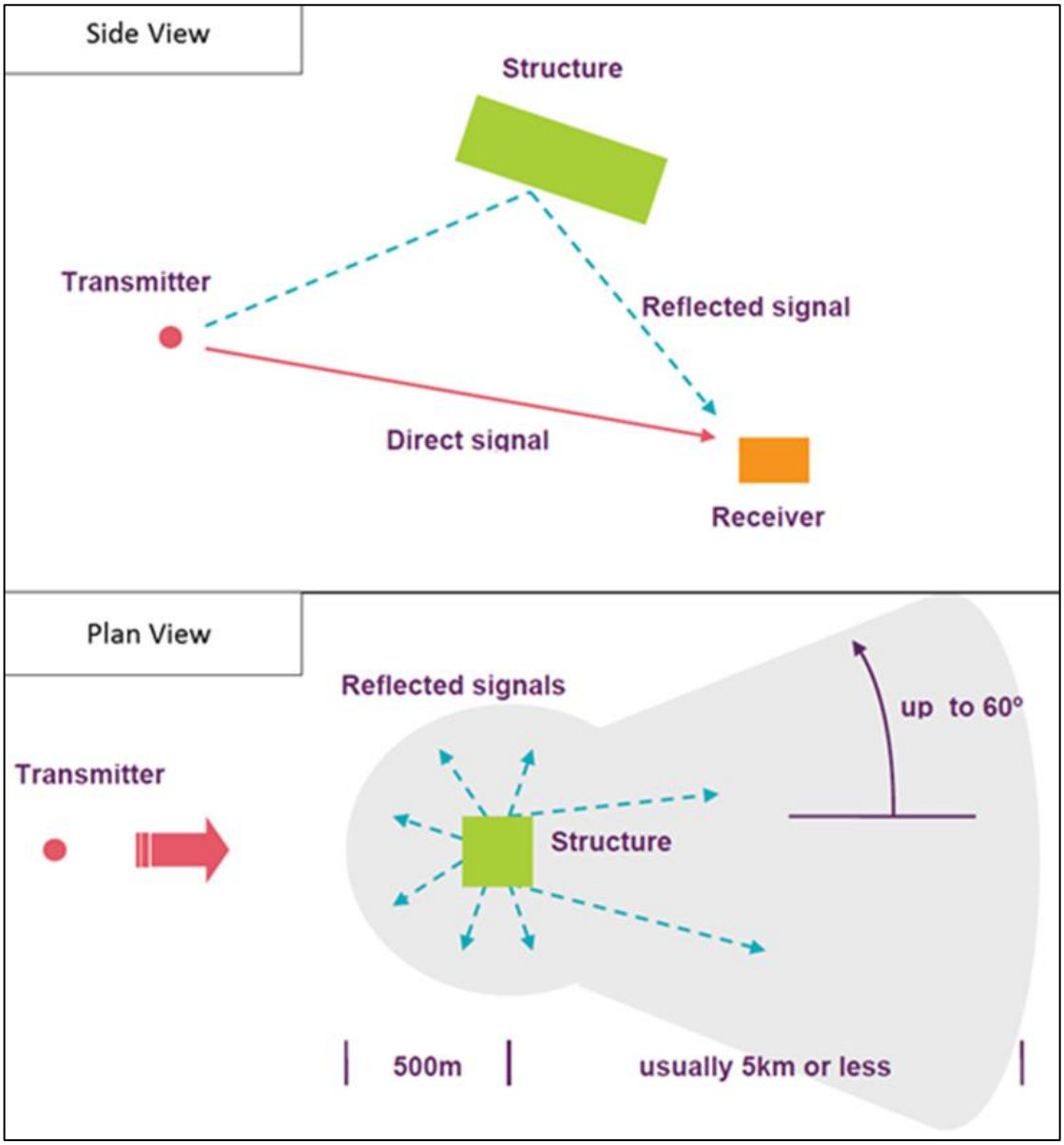


Figure 5 *Reflection zones*

In practice, it is considered highly unlikely that reflections will have an effect for receivers in front of the building or on either side when viewed from the location of the transmitter. For digital transmissions in particular, it is unlikely that issues will occur if the angle between the direct signal and the reflected signal is more than 30 degrees[6].

[6] This is known to be the angle that Arqiva considers when safeguarding its Television Re-Broadcast Links with regard to reflections from wind turbines – whilst wind turbines cause issues that are different to buildings this particular issue is similar for the two.

The reflection zone has been constructed in accordance with the Ofcom approach, however the angle considered is 30 degrees rather than 60 degrees. This is in order to represent a more realistic scenario for digital transmissions.

Reflection issues are most likely to cause a noticeable impact if:

- The direct signal from transmitter to receiver is weak (e.g. obstructed by terrain or buildings);
- The reflected signal from the building is strong (e.g. clear radio line of sight from the transmitter to the building and the building to the receiver).

The worst-case scenario is for both of the above conditions to be satisfied. The best-case scenario is for neither of the above conditions to be satisfied.

4 TECHNICAL ASSESSMENT

4.1 Potential Interference Areas

The shadow and reflection zones have been defined based on the geometry as set out in the previous section. Both zones extend to a distance of 5km beyond the development location in accordance with the Ofcom guidance.

In the case of the shadow zone, this has been modelled as having straight sides in order to be conservative. In actuality, due to diffraction effects, the zone would have a more triangular shape as shown in Figure 4 in the previous section. Figure 6 below shows the potential interference areas (reflection and shadow zones) associated with the development.

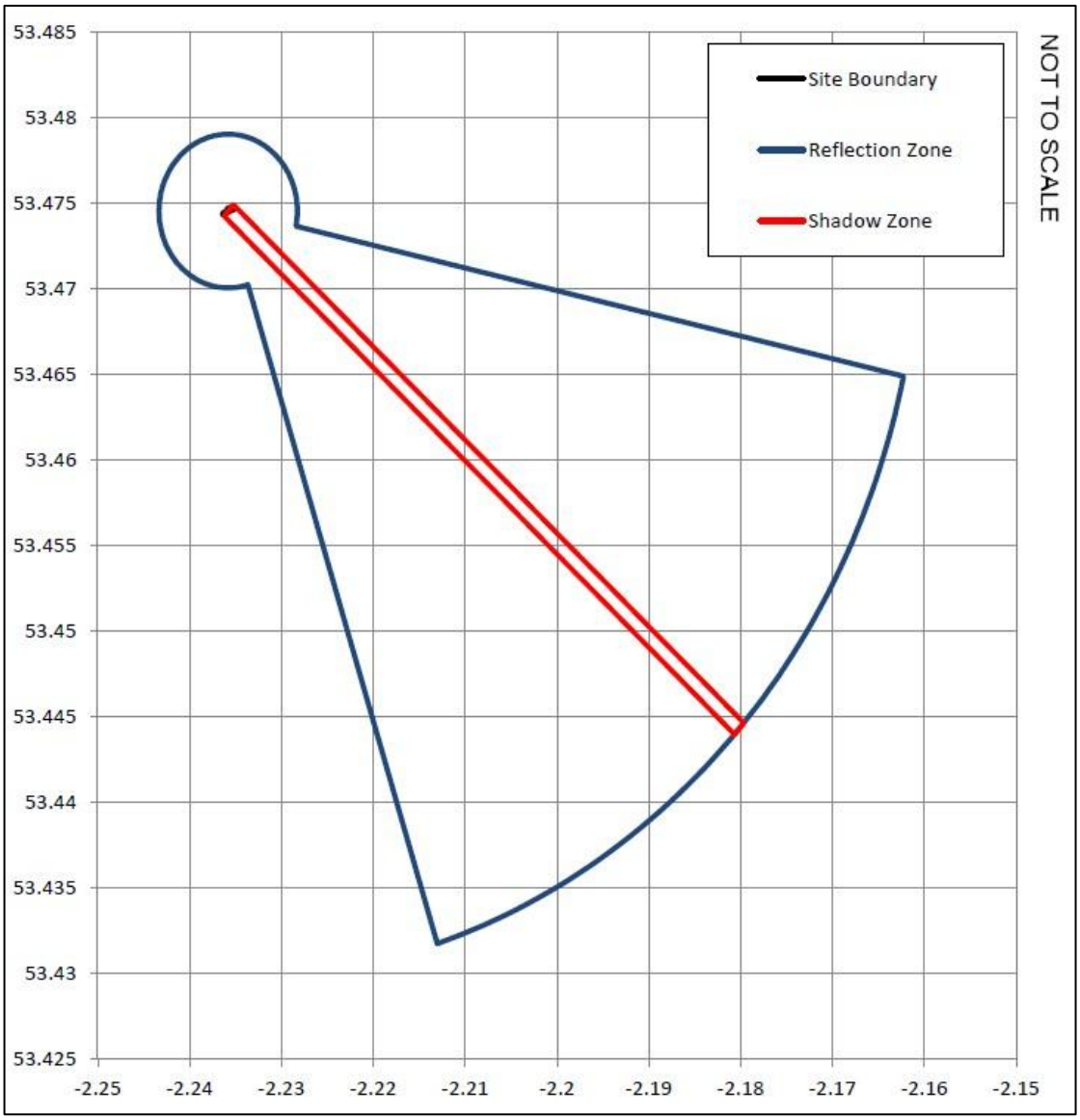


Figure 6 *Interference areas*

Figure 7 below shows the interference zones overlaid onto aerial imagery.

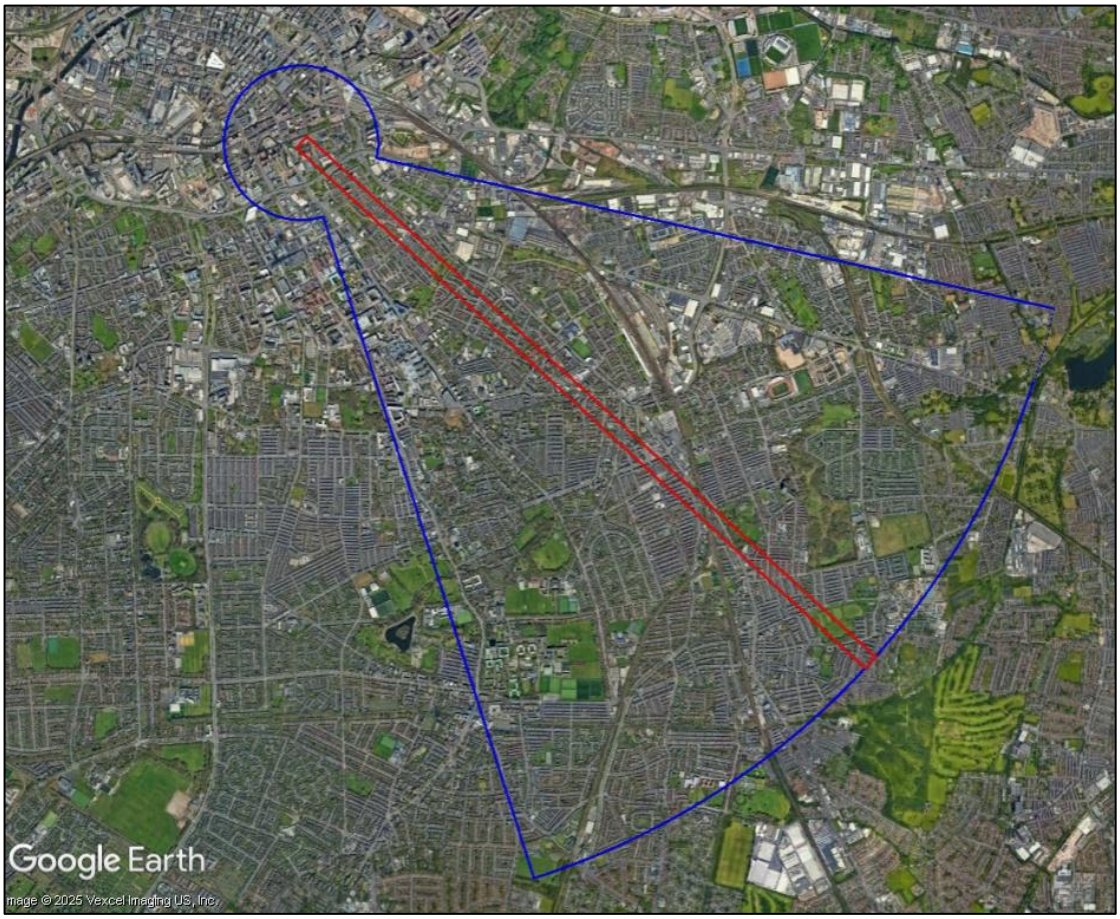


Figure 7 *Interference zones map*

4.2 Potential Diffraction Issues

The shadow zone passes over urban areas that contain commercial and residential buildings. Areas closest to the development are at the highest risk of experiencing television interference. This is typically limited to 1km based on Pager Power's assessment experience. Commercial buildings, multi-storey flats and low rise dwellings are located within 1km of the development shadow zone.

4.3 Potential Reflection Issues

Reflection effects are most likely if the transmitter does not have direct radio line of sight to the receiving aerial.

The predicted coverage of the Winter Hill transmitter is generally good in the surrounding area. Interference due to reflections are most likely when:

- The receiving aerial is unobstructed by existing obstacles;
- The reflected signal path via the development is unobstructed;
- The angle between the reflected signal via the development and the direct signal is small.

Interference is most likely if all of the above criteria are met. Interference is least likely if none of the above criteria are met.

In practice it is unlikely that all of the above criteria would be met for the development. In particular, locations that are below radio line of sight from the transmitter are unlikely to have an unobstructed path to the development, due to their relative heights. Impacts due to reflections are considered unlikely.

5 TELEVISION BASELINE SURVEY

5.1 Overview

The purpose of a baseline survey is to establish current signal strength and quality in the area. The baseline survey serves three purposes these are:

1. It confirms which transmitter is serving most homes in the areas surveyed (for television);
2. It provides an indicator regarding the likelihood of interference. If current signals are of good quality, minor degradation is less likely to have a noticeable effect;
3. It allows a 'before and after' comparison to be made in the event that a complaint is received.

A baseline television reception survey was undertaken for the development on the 10th of September 2025.

Survey measurements were taken using Pager Power's custom survey vehicle with a wideband UHF aerial extended to a height of 10 metres above ground level. This was connected to television analyser to record the signal strength and stability.

The strength of the recorded signals is categorised in accordance with Table 3 below.

Average Signal Strength (dB)	Subjective Signal Strength Definition
<35	Low
35 – 45	Moderate
45 – 55	Good
55+	Very Good

Table 3 *Signal strength categories*

5.2 Survey Locations

Figure 8 below shows the survey locations overlaid onto aerial photography. The development location and the shadow zone are also shown. More readings are typically carried out closer to the building. This is because interference is generally more likely the closer the location is to the obstruction. Survey locations were chosen pre-survey (within the shadow zone); however, safe and available access influenced the specific position on the day. The locations in Figure 8 below show the actual survey locations. Television measurements were taken at survey locations 1 to 8. No suitable survey locations within the shadow zone were accessible during the survey between the development and location 1.



Figure 8 *Survey locations*

5.3 Survey Results

A summary of the television survey results is presented in Table 4 below and on the following pages. Detailed survey results are shown in Appendix A. Survey photography is shown in Appendix B.

Location	Average Measured Signal Strength (dB)	Remarks	High Level Conclusion
1	Overall average: **38.3 (Moderate)** Main TV MUX[7]: **41.4 (Moderate)** Local TV MUX: **29.0 (Low)**	No aerials or satellite dishes were observed in this location. All main multiplexes displayed fine picture and audio quality. An average of moderate signal strength and signal fluctuations of less than or equal to 0.8dB. One local multiplex displayed fine picture and audio quality. The other local multiplex did not decode. An average of low signal strength and signal fluctuations of less than or equal to 0.5dB.	The survey location is approximately 105m from the development and within its shadow zone. Predominately multistorey commercial buildings adjacent to this location. A reduction in signal strength is possible based on the proximity to the development. Effects in this area cannot be entirely ruled out, particularly for the local multiplexes.

[7] Multiplex.

Location	Average Measured Signal Strength (dB)	Remarks	High Level Conclusion
2	Overall average: **41.2 (Moderate)** Main TV MUX: **45.1 (Good)** Local TV MUX: **29.5 (Low)**	Multiple horizontally polarised aerials and satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of good signal strength and signal fluctuations of less than or equal to 0.3dB. One local multiplex displayed fine picture and audio quality. The other local multiplex did not decode. An average of low signal strength and signal fluctuations of less than or equal to 0.3dB.	The survey location is approximately 335m from the development and within its shadow zone. Predominately low-rise residential housing adjacent to this location. A reduction in signal strength is possible based on the proximity to the development. Effects in this area cannot be entirely ruled out, particularly for the local multiplexes.
3	Overall average: **41.7 (Moderate)** Main TV MUX: **45.7 (Good)** Local TV MUX: **29.8 (Low)**	Multiple horizontally polarised aerials and satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of good signal strength and signal fluctuations of less than or equal to 0.4dB. One local multiplex displayed fine picture and audio quality. The other local multiplex did not decode. An average of low signal strength and signal fluctuations of less than or equal to 0.3dB.	The survey location is approximately 610m from the development and within its shadow zone. Predominately low-rise residential housing adjacent to this location. A reduction in signal strength is possible based on the proximity to the development. Effects in this area cannot be entirely ruled out, particularly for the local multiplexes.

Location	Average Measured Signal Strength (dB)	Remarks	High Level Conclusion
4	Overall average: **54.3 (Good)** Main TV MUX: **60.4 (Very Good)** Local TV MUX: **35.9 (Moderate)**	Multiple horizontally polarised aerials were observed. No satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of very good signal strength and signal fluctuations of less than or equal to 0.3dB. One local multiplex displayed fine picture and audio quality. The other local multiplex did not decode. An average of moderate signal strength and signal fluctuations of less than or equal to 0.2dB.	The survey location is approximately 760m from the development and within its shadow zone. Predominately low-rise residential housing adjacent to this location. A reduction in signal strength is possible based on the proximity to the development. Effects in this area cannot be entirely ruled out, particularly for the local multiplexes.
5	Overall average: **56.8 (Very Good)** Main TV MUX: **63.4 (Very Good)** Local TV MUX: **36.9 (Moderate)**	Multiple horizontally polarised aerials and satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of very good signal strength and signal fluctuations of less than or equal to 0.4dB. One local multiplex displayed fine picture and audio quality. The other local multiplex did not decode. An average of moderate signal strength and signal fluctuations of less than or equal to 0.3dB.	This location is approximately 1.18km from the development. Predominately low-rise residential housing adjacent to this location. Effects at this range are likely to be relatively small based on previous experience. Based on the current signal quality, effects are unlikely to be noticeable for the main multiplexes. Effects upon local multiplexes are considered possible due to current signal strength.

Location	Average Measured Signal Strength (dB)	Remarks	High Level Conclusion
6	Overall average: **53.5 (Good)** Main TV MUX: **57.1 (Very Good)** Local TV MUX: **42.6 (Moderate)**	Multiple satellite dishes were observed. No aerials were observed. All main multiplexes displayed fine picture and audio quality. An average of very good signal strength and signal fluctuations of less than or equal to 0.5dB. Both local multiplexes displayed fine picture and audio quality. An average of moderate signal strength and signal fluctuations of less than or equal to 0.4dB.	This location is approximately 2.26km from the development. Predominately low-rise residential housing adjacent to this location. Effects at this range are likely to be relatively small based on previous experience. Based on the current signal quality, effects are unlikely to be noticeable for the main multiplexes. Effects upon local multiplexes are considered possible due to current signal strength.
7	Overall average: **55.0 (Good)** Main TV MUX: **60.9 (Very Good)** Local TV MUX: **37.3 (Moderate)**	Multiple horizontally polarised aerials and satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of very good signal strength and signal fluctuations of less than or equal to 0.4dB. Both local multiplexes displayed fine picture and audio quality. An average of moderate signal strength and signal fluctuations of less than or equal to 0.4dB.	This location is approximately 2.94km from the development. Predominately low-rise residential housing adjacent to this location. Effects at this range are likely to be relatively small based on previous experience. Based on the current signal quality, effects are unlikely to be noticeable.

Location	Average Measured Signal Strength (dB)	Remarks	High Level Conclusion
8	Overall average: **61.5 (Very Good)** Main TV MUX: **66.3 (Very Good)** Local TV MUX: **47.4 (Good)**	Multiple horizontally polarised aerials were observed. No satellite dishes were observed. All main multiplexes displayed fine picture and audio quality. An average of very good signal strength and signal fluctuations of less than or equal to 0.3dB. Both local multiplexes displayed fine picture and audio quality. An average of good signal strength and signal fluctuations of less than or equal to 0.3dB.	This location is approximately 4.23km from the development. Predominately low-rise residential housing adjacent to this location. Effects at this range are likely to be relatively small based on previous experience. Based on the current signal quality, effects are unlikely to be noticeable.

Table 4 *Television baseline survey results*

6 MITIGATION

6.1 Mitigation Requirement

If an adverse effect on television services occurs and is attributable to the development, mitigation may be required. The most effective form of mitigation is dependent on the specific impact. Common options are shown below.

Mitigation options include:

- 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.

6.2 Recommended Options

If interference were to occur for a small number of dwellings, it is likely that the installation of a satellite television receiver would be the most suitable option.

If effects are experienced for dwellings with poor quality or low receiving aerials, the best option may be to upgrade and/or elevate the existing aerial.

6.3 Recommended Process

It is possible that no adverse effects will occur due to the current reception quality in the surrounding area.

It is therefore recommended to investigate any reports of interference in order to determine whether these are attributable to the development. If this is found to be the case, mitigation can be applied.

There is no reason to install pre-emptive mitigation.

7 CONCLUSIONS

7.1 Findings

- A baseline site survey was undertaken on the 10th of September 2025 to record the baseline terrestrial television signal strength and quality. The site survey also confirmed that the Winter Hill transmitter is the main transmitter serving the area surrounding the proposed development;
- The average terrestrial signal strength is very good in the development shadow zone for the main multiplexes and moderate for the local (lower power) multiplexes;
- Negative effects upon signal strength are typically limited to within 1km of the development and within its shadow zone based on Pager Power's industry experience;
- Multistorey dwellings and commercial properties are predominately located within 1km of the development. The signal strength within this range was recorded as good for the main multiplexes, and low for the local multiplexes. A reduction in signal strength is considered unlikely; however, effects cannot be entirely ruled out considering the baseline signal strength, particularly for local multiplexes;
- Any interference would be due to shadowing effects i.e. the weakening of the transmitted signal due to the physical presence of the buildings;
- At locations beyond 1km and within the shadow zone, the signal strength was on average very good for the main multiplexes, and moderate for the local multiplexes. Effects at this range are likely to be relatively small based on previous experience.

7.2 Mitigation

No requirement for pre-emptive mitigation has been identified.

In the event that effects are reported, it is recommended that a reception measurement is undertaken (post-construction) to investigate the likely cause of the interference.

Mitigation measures should be installed if reported effects are found to be attributable to the development. Solutions are likely to be readily available if required, the most common options are presented in Section 6.

APPENDIX A – DETAILED SURVEY RESULTS

Location 1

Coordinates: Lon: -2.234488, Lat: 53.474076					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	27.0 +/- 0.3	$2.0x10^{-3}$	Fine	Fine
27	Glmux	31.0 +/- 0.5	DND[8]	DND	DND
29	SDN	44.6 +/- 0.3	$1.5x10^{-5}$	Fine	Fine
31	Arqiva A	40.1 +/- 0.3	$2.6x10^{-4}$	Fine	Fine
32	BBC A	42.1 +/- 0.1	$9.8x10^{-7}$	Fine	Fine
34	Digital 3&4	40.0 +/- 0.3	$2.0x10^{-5}$	Fine	Fine
35	BBC B	40.9 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	40.5 +/- 0.8	$1.0x10^{-3}$	Fine	Fine

Notes: No satellites dishes or aerials observed.

[8] Did not decode.

Location 2

Coordinates: Lon: -2.231805, Lat: 53.472733					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	33.5 +/- 0.2	$9.5x10^{-5}$	Fine	Fine
27	Glmux	25.4 +/- 0.3	DND	DND	DND
29	SDN	45.7 +/- 0.3	$6.3x10^{-7}$	Fine	Fine
31	Arqiva A	44.3 +/- 0.3	$1.2x10^{-5}$	Fine	Fine
32	BBC A	45.1 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	45.6 +/- 0.3	$2.1x10^{-7}$	Fine	Fine
35	BBC B	46.0 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	44.1 +/- 0.2	$1.0x10^{-4}$	Fine	Fine

Notes: Multiple horizontally polarised aerials and satellite dishes observed.

Location 3

Coordinates: Lon: -2.229321, Lat: 53.470658					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	31.1 +/- 0.2	$1.2x10^{-3}$	Fine	Fine
27	Glmux	28.4 +/- 0.3	DND	DND	DND
29	SDN	46.2 +/- 0.4	$1.4x10^{-4}$	Fine	Fine
31	Arqiva A	46.5 +/- 0.3	$6.8x10^{-5}$	Fine	Fine
32	BBC A	46.4 +/- 0.2	$2.0x10^{-6}$	Fine	Fine
34	Digital 3&4	45.5 +/- 0.3	$8.0x10^{-6}$	Fine	Fine
35	BBC B	44.3 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	45.3 +/- 0.4	$5.3x10^{-4}$	Fine	Fine

Notes: Multiple horizontally polarised aerials and satellite dishes observed.

Location 4

Coordinates: Lon: -2.227014, Lat: 53.470207					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	39.4 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
27	Glmux	32.4 +/- 0.2	DND	DND	DND
29	SDN	58.5 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
31	Arqiva A	59.3 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
32	BBC A	60.7 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	61.0 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
35	BBC B	61.6 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	61.3 +/- 0.3	$1.0x10^{-7}$	Fine	Fine

Notes: Multiple horizontally polarised aerials observed.

Location 5

Coordinates: Lon: -2.222809, Lat: 53.467333					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	41.9 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
27	Glmux	31.9 +/- 0.3	DND	DND	DND
29	SDN	64.4 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
31	Arqiva A	64.1 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
32	BBC A	63.4 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	63.4 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
35	BBC B	62.5 +/- 0.4	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	62.7 +/- 0.3	$1.0x10^{-7}$	Fine	Fine

Notes: Multiple horizontally polarised aerials and satellite dishes observed.

Location 6

Coordinates: Lon: -2.210484, Lat: 53.461004					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	45.1 +/- 0.4	$1.0x10^{-7}$	Fine	Fine
27	Glmux	40.0 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
29	SDN	61.6 +/- 0.4	$1.0x10^{-7}$	Fine	Fine
31	Arqiva A	61.2 +/- 0.5	$1.0x10^{-7}$	Fine	Fine
32	BBC A	56.3 +/- 0.5	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	56.2 +/- 0.5	$1.0x10^{-7}$	Fine	Fine
35	BBC B	56.3 +/- 0.4	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	51.0 +/- 0.3	$1.0x10^{-7}$	Fine	Fine

Notes: Multiple satellite dishes observed.

Location 7

Coordinates: Lon: -2.203282, Lat: 53.456703					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	37.6 +/- 0.4	$1.0x10^{-7}$	Fine	Fine
27	Glmux	36.9 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
29	SDN	61.3 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
31	Arqiva A	60.7 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
32	BBC A	60.5 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	60.8 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
35	BBC B	61.4 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	60.5 +/- 0.4	$1.0x10^{-7}$	Fine	Fine

Notes: Multiple horizontally polarised aerials and satellite dishes observed.

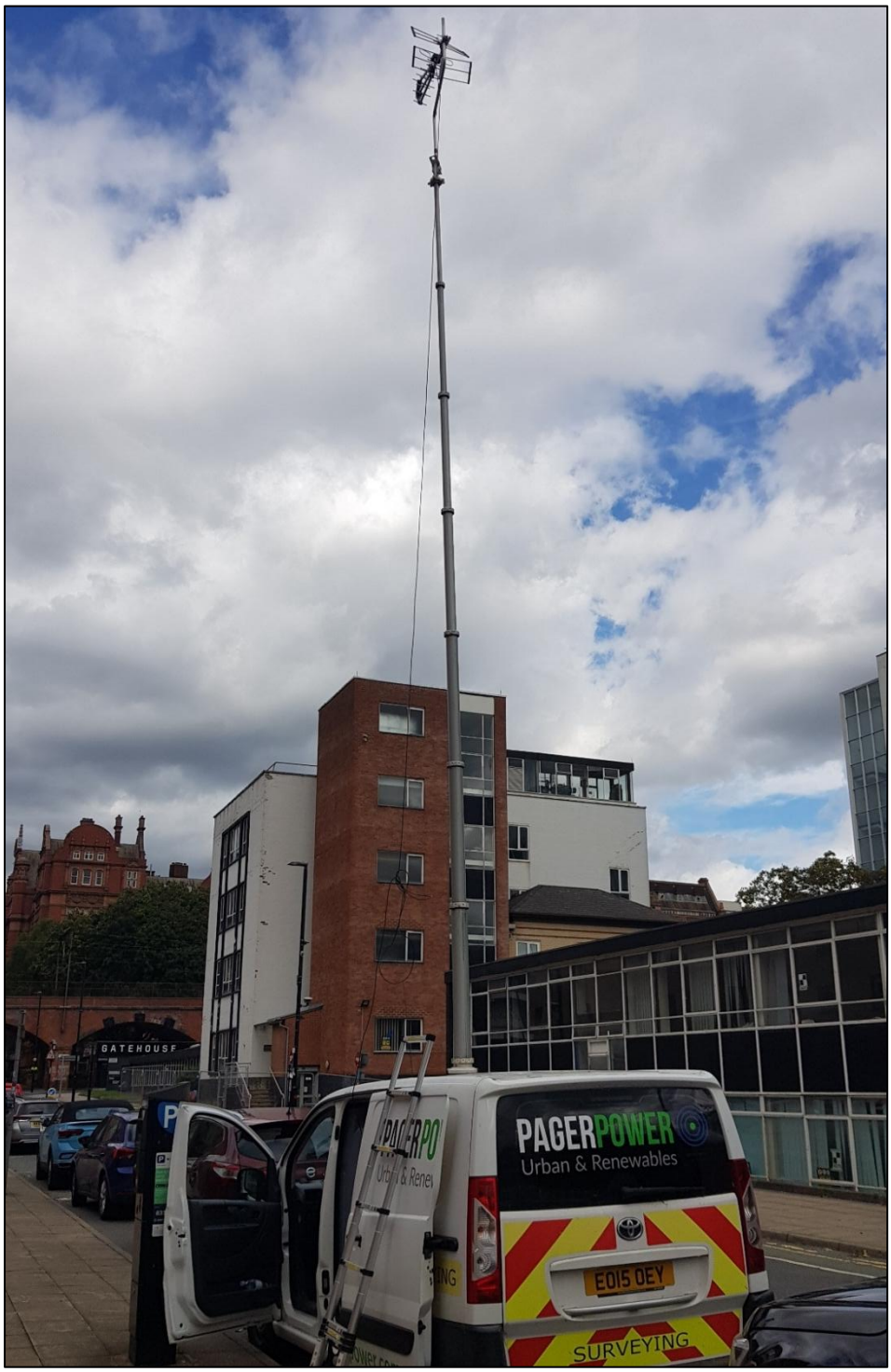
Location 8

Coordinates: Lon: -2.188863, Lat: 53.448959					
Channel	**Service**	**Signal Strength (dBμV)**	**BER**	**Picture**	**Audio**
24	LTVmux	49.5 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
27	Glmux	45.3 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
29	SDN	66.0 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
31	Arqiva A	66.3 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
32	BBC A	66.8 +/- 0.2	$1.0x10^{-7}$	Fine	Fine
34	Digital 3&4	66.5 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
35	BBC B	65.9 +/- 0.3	$1.0x10^{-7}$	Fine	Fine
37	Arqiva B	66.0 +/- 0.2	$1.0x10^{-7}$	Fine	Fine

Notes: Multiple horizontally polarised aerials observed.

APPENDIX B – SURVEY PHOTOGRAPHS

Location 1



Location 2



Location 3



Location 4



Location 5



Location 6


PAGERPOWER
Urban & Renewables
E015 OEY
SURVEYING
SURVEYING

Location 7



Location 8


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PAGERPOWER

Urban & Renewables

Pager Power Limited
Stour Valley Business Centre
Sudbury
Suffolk
CO10 7GB

Tel: +44 1787 319001 **Email:** info@pagerpower.com **Web:** www.pagerpower.com