PAGERPOWER
Urban & Renewables

Desk-Based Satellite Television Interference Assessment

Plot 9B, First Street

Vita Meadow Ltd

March 2025







PLANNING SOLUTIONS FOR:

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ADMINISTRATION PAGE

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1	March 2025	Initial issue

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EXECUTIVE SUMMARY

Overview

Pager Power has been commissioned to investigate the potential impact of a proposed building development upon satellite television services in its surrounding area. The proposed development is located on the corner of Medlock Street, Hulme Street and Newcastle Street in Manchester city centre. The proposed development comprises one building with a maximum height of 76.90m above ground.

The report has determined the potential for effects upon satellite television reception by identifying the relevant transmitters and satellites, and modelling appropriate diffraction and reflection zones, and diffraction loss calculations as appropriate.

Assessment Conclusions

The overall conclusions for satellite television transmissions are:

- The modelled shadow zone for satellite television services is limited to 200m northwest of the proposed development's location;
- The zone covers buildings along First Street, Tony Willison Place, and parts of Medlock Street, which comprise primarily commercial buildings. No satellite dishes have been observed through a review of available street view imagery;
- Some tolerance is built into the receiving equipment, and it is possible that a satellite signal may still be maintained even if line of sight were blocked.

Recommendations

Any reported terrestrial television interference should be investigated by means of a post-construction reception measurement. This may be carried out by a local satellite engineer to review the existing coverage. The modelling can then be considered to determine whether the effect is attributable to the development.

Mitigation

No pre-emptive mitigation is required.

Technical mitigation solutions (outlined in Section 4) could be implemented in the event that a significant impact occurs.

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ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 61 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 of a proposed building development upon satellite television services in its surrounding area. The proposed development is located on the corner of Medlock Street, Hulme Street and Newcastle Street in Manchester city centre. The proposed development comprises one building with a maximum height of 76.90m above ground level.

The report has determined the potential for effects upon satellite television reception by identifying the relevant transmitters and satellites, and modelling appropriate diffraction and reflection zones, and diffraction loss calculations as appropriate.

1.2 Assessment Requirement

The proposed development will introduce a new tall structure into the urban environment which have the potential to interact with satellite television signals and cause interference in the surrounding area. This report has been completed to investigate potential issues arising from its development.

1.3 Proposed Development Location

The proposed development footprint is indicated by the red outline in Figure 1 below.

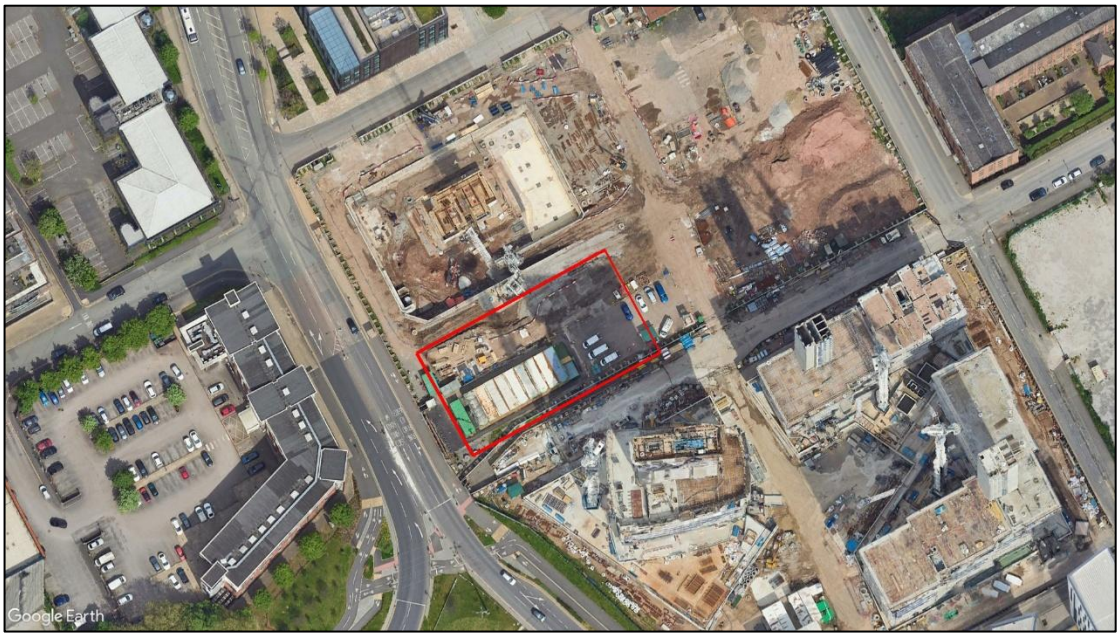


Figure 1 *Proposed development location*

1.4 Proposed Development General Arrangement Plan

The development general arrangement plan is shown in Figure 2 below[1]. The proposed development is outlined in red.

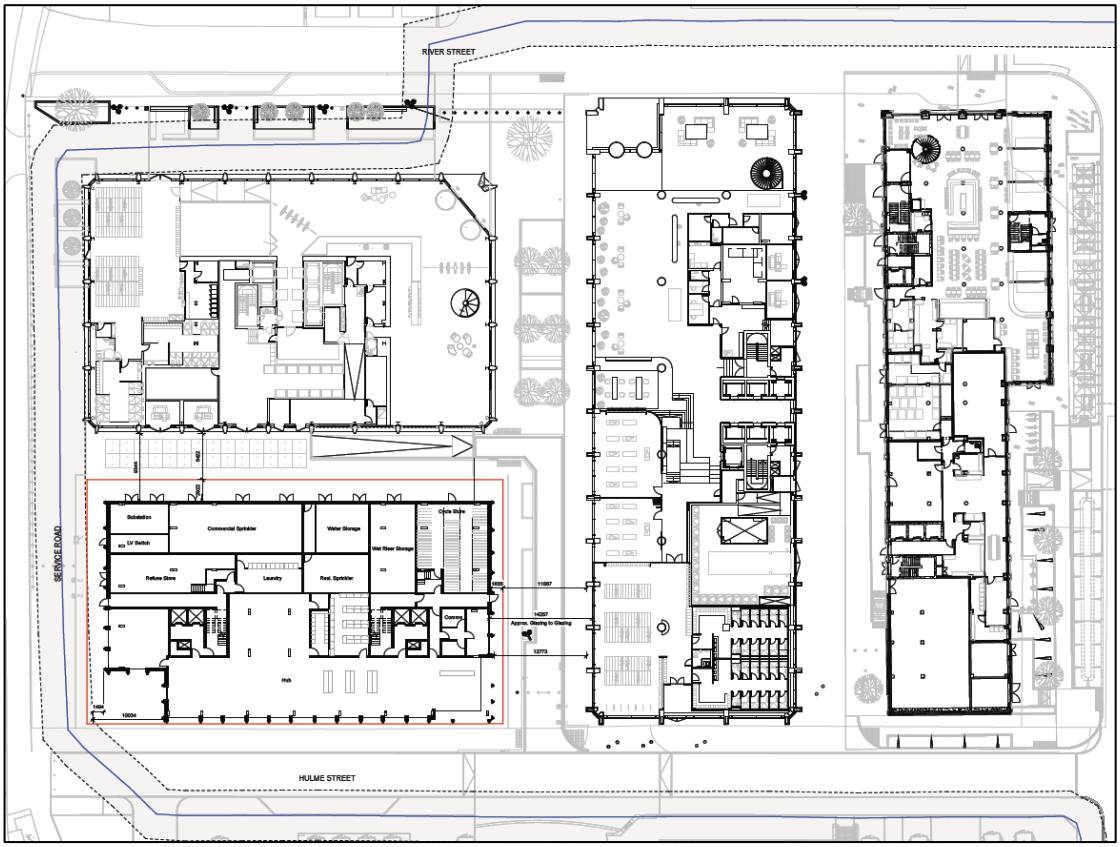


Figure 2 *Proposed development general arrangement plan*

[1] Source: 1207-TGA-XX-00-DR-A-10200-P04 General Arrangement - Site Plan.pdf

2 INTERFERENCE MECHANISMS

2.1 Satellite Television

It is understood that satellite television services in the UK are predominantly provided by Astra satellites, which is a group of geostationary satellites at longitudes between 19.2 degrees and 31.5 degrees. Satellite dishes are typically mounted externally with a vertical elevation angle that varies based on latitude. In the UK, elevation angles are typically around 21 to 27 degrees[2].

2.2 Obstruction of the Signal – Television Services

This is caused by the building physically blocking the transmitted signal, reducing the strength of the carrier signal in the shadow of the building. For satellite television reception, all interference areas are north of an obstruction in the northern hemisphere. The following is true for satellite television signals:

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

2.3 Satellite Television Interference

The principle of shadowing (diffraction) is applicable to satellite transmissions. Signals from a satellite tend to come from a much steeper angle than those from a terrestrial transmitter, however receivers that are located in close proximity to an obstruction could still be affected. The Ofcom guidance[3] states:

'Satellite TV reception is not generally affected by new structures unless the development blocks the 'line-of-sight' between a dish antenna and the satellite in the sky. While terrestrial TV aerials are generally mounted to receive signals in line with the horizon, and are therefore liable to be blocked by taller structures, satellite signals are received from a much higher elevation. This means that disruption to satellite reception is usually limited only to cases where a tall building is erected very close to an existing building.'

Figure 3 on the following page, taken from the Ofcom guidance, shows an example of a receptor that is in the shadow zone for a terrestrial transmitter but outside the shadow zone for a satellite.

[2] https://www.hitch-n-pitch.co.uk/dish-alignment-for-sky-digital/
[3] Source: Ofcom (2009): Tall Structures and their impact on broadcast and other wireless services.

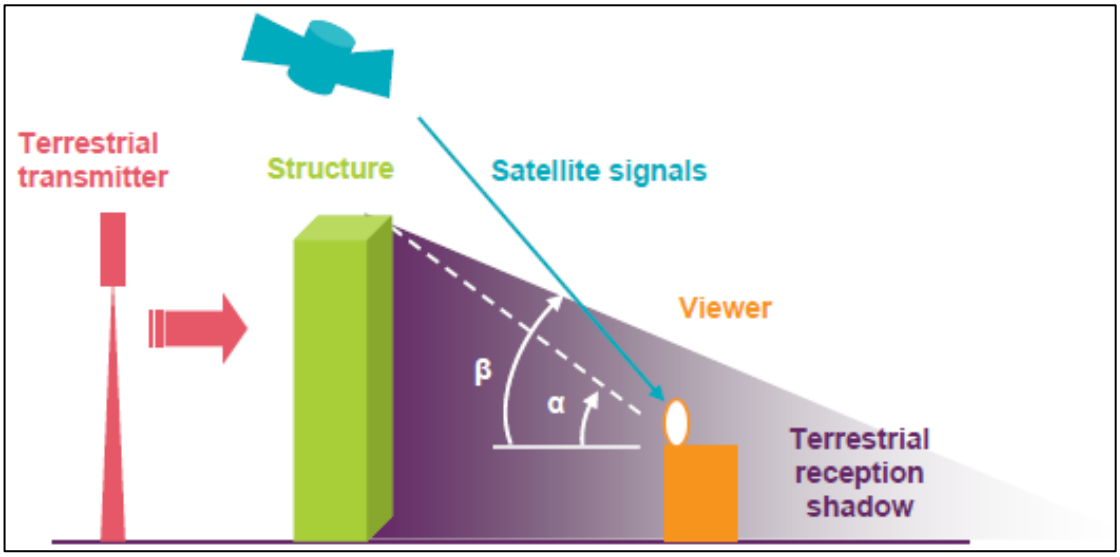


Figure 3 *Satellite reception not affected by a new structure*

The dimensions of the shadow zone for a satellite are dependent on:

- The relative height of the satellite dish and the building.
- The vertical angle from the satellite dish to the satellite itself – this is assumed to be 25 degrees.

3 SATELLITE TELEVISION TECHNICAL ASSESSMENT

3.1 Shadow Zones

Shadow zones have been modelled for five satellite locations, based on the longitude of the main ASTRA satellites.

These zones have been constructed based on a maximum development height of 76.90m above ground level across the entire development area. Note that the tallest part of the development will not encompass the whole area, therefore the shadow zones may in practice not extend as far as the model shows and are therefore conservative. An assumed dish height of 5 metres above ground level has been used considering a conservative review of the buildings in the developments immediate shadow (within 100-200m).

Figure 4 below shows the individual shadow zones for five commonly used satellites and their positions.

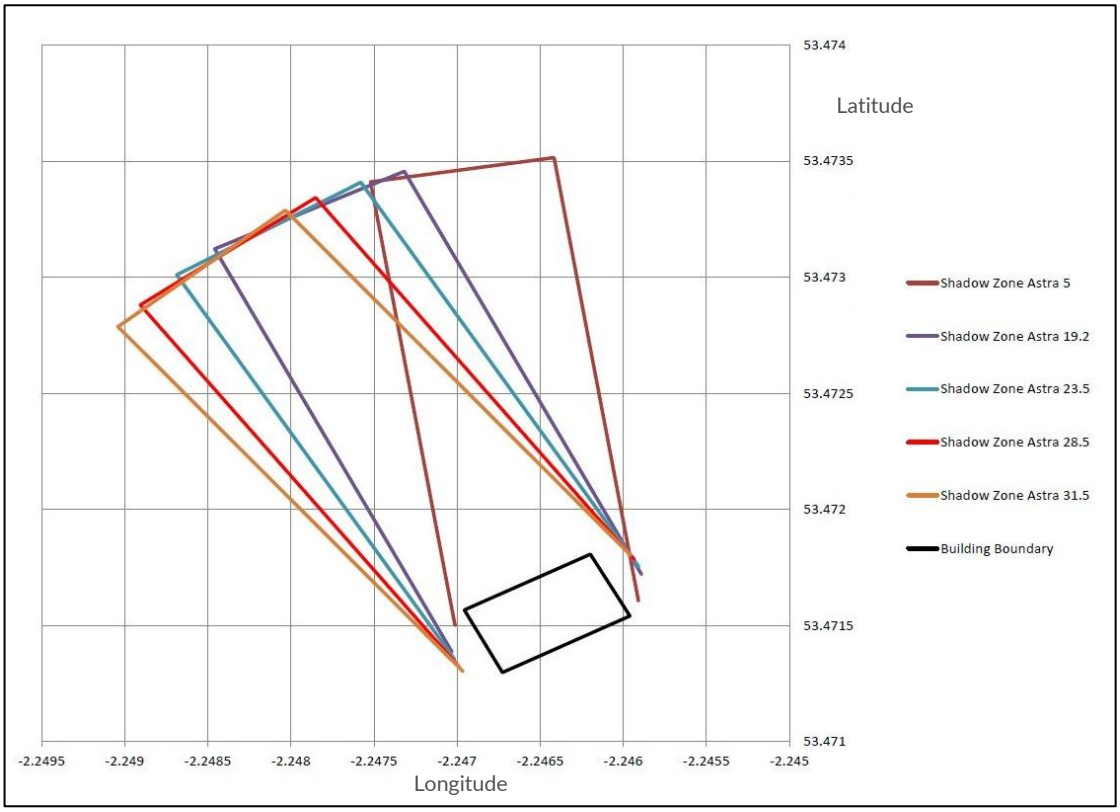


Figure 4 *Satellite television interference zones*

Figure 5 below shows the combined satellite shadow zones overlaid onto aerial imagery.

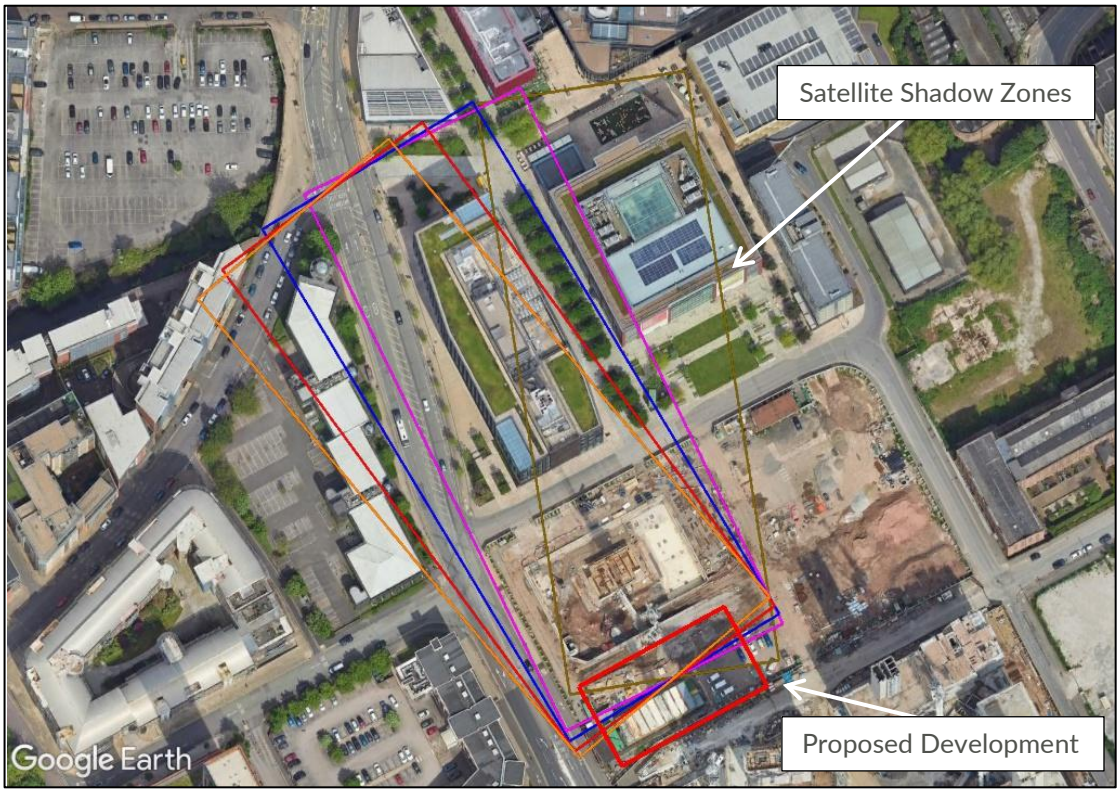


Figure 5 *Satellite television interference zones (aerial image)*

Figure 6 below shows the combined satellite shadow zone overlaid onto a 3D aerial image.

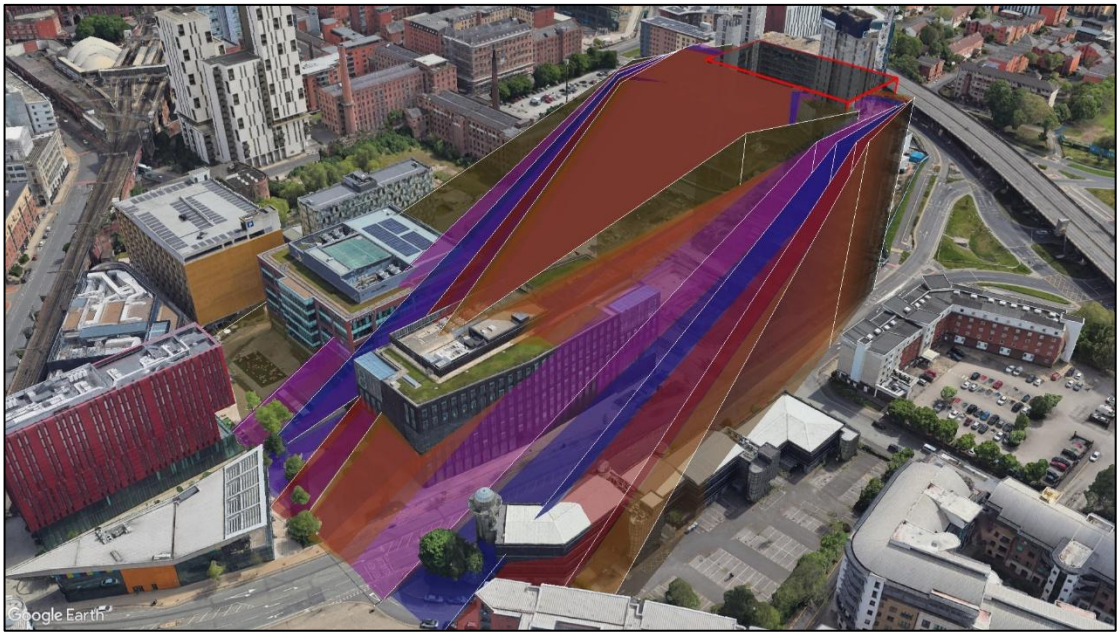


Figure 6 *3D Satellite television interference zones (aerial image)*

3.2 Identified Buildings

Eight buildings have been identified within the shadow zone of the proposed development and have been considered for potential interference. Figure 7 below shows buildings within the maximum lateral extent of the shadow zones (in green).

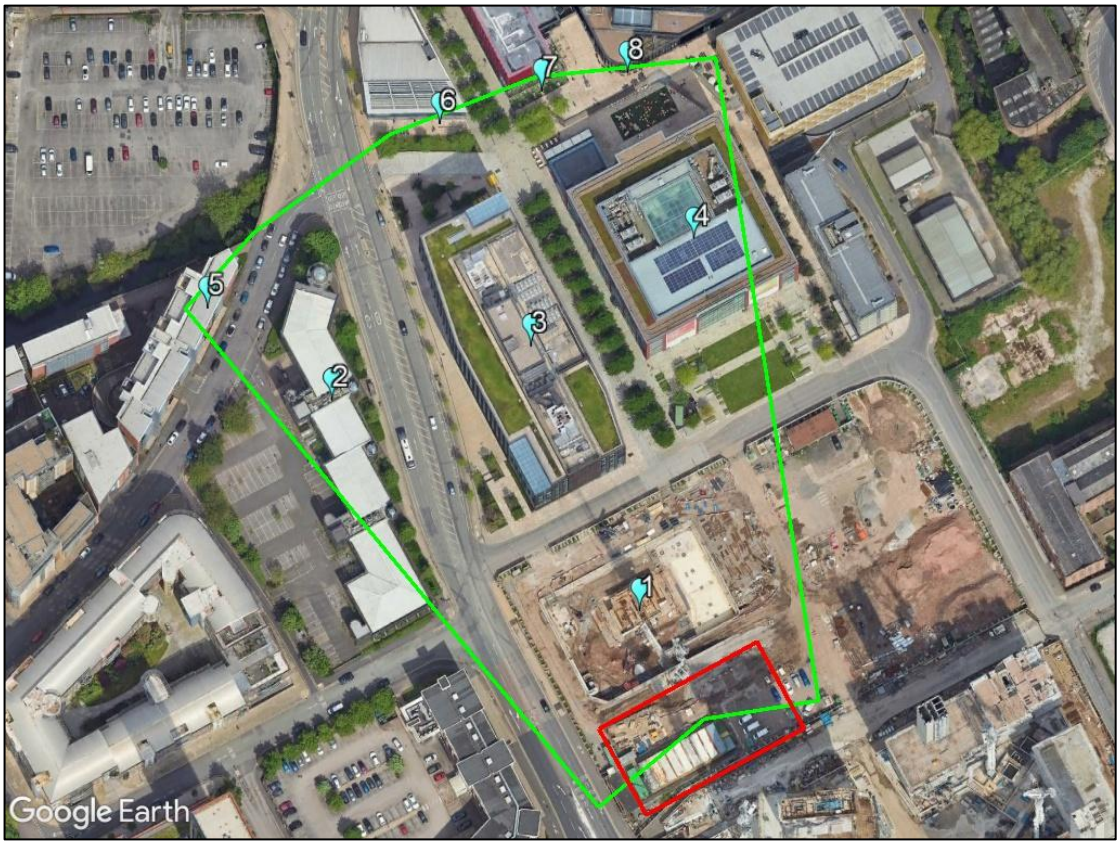


Figure 7 *Buildings identified within the shadow zones*

Table 1 on the following page presents details on the buildings and the impact prediction based upon the building heights, uses, and available imagery.

Building 1 in Figure 7 is still under construction and Building 2 has recently been demolished. The predicted impact upon the new buildings is based upon details (including land use and heights) from the planning application portal.

Number	Building name	Commercial / Residential	Whether roof extends above the shadow zone	Aerials observed	Predicted likelihood of interference
1	Manchester Digital Campus	Commercial	The building's roof is expected to be vertically within the shadow zone	None	Low
2	One City Road East	Commercial	A high proportion of the building's roof is expected to extend above the 3D shadow zone		
3	No. 8, First Street	Commercial	Approximately half of the building's roof extends above the 3D shadow zone		
4	No. 1, First Street	Commercial	A very high proportion of the building's roof extends above the 3D shadow zone		
5	The Nile	Residential	The entire roof extends above the 3D shadow zone		
6	2, First Street	Commercial	The entire roof extends above the 3D shadow zone		
7	INNSIDE Hotel	Commercial	The entire roof extends above the 3D shadow zone		
8	HOME Theatre	Commercial	The entire roof extends above the 3D shadow zone		

Table 1 *Predicted impacts upon identified buildings*

3.3 Results Discussion

The identified buildings are primarily commercial in nature. Satellite television is not expected to be used in commercial buildings. Satellites are typically located on the roof of a building, as such where the roof a building extends above the 3D shadow zone significant effects are not expected. A review of available street view imagery has identified no existing dishes. Where no dishes exist, interference cannot be experienced. Satellites dishes may exist on rooftops which cannot be observed from a ground-based observer.

Considering the above, no significant impacts are predicted upon satellite television reception. If any report of interference is received from these buildings, it should be investigated.

4 MITIGATION

4.1 Mitigation Requirement

If an adverse effect on satellite television services occurs and is attributable to the proposed development, mitigation may be required. Pre-emptive mitigation requirement has not been identified.

4.2 Satellite Television Mitigation Options

Below is a list of actions that can mitigate satellite television reception issues caused by building development:

- Increase the height of the receiving dish;
- Provision of cable television;
- Provision of a bespoke receiving solution e.g. a system to receive and re-distribute the satellite television signal.

4.3 Recommended Options

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

It may also be possible for television services to be supplied by an alternate transmitter in the surrounding area.

4.4 Recommended Process

It is possible that no adverse effects will occur due to the existing buildings and their use type in the shadow zone of the proposed development.

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

5 CONCLUSIONS

5.1 Assessment Conclusions

The overall conclusions for satellite television transmissions are:

- The modelled shadow zone for satellite television services is limited to 200m northwest of the proposed development's location;
- The zone covers buildings along First Street, Tony Willison Place, and parts of Medlock Street, which comprise primarily commercial buildings. No satellite dishes have been observed through a review of available street view imagery;
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5.2 Recommendations

Any reported terrestrial television interference should be investigated by means of a post-construction reception measurement. This may be carried out by a local satellite engineer to review the existing coverage. The modelling can then be considered to determine whether the effect is attributable to the development.

5.3 Mitigation

No pre-emptive mitigation is required.

Technical mitigation solutions (outlined in Section 4) could be implemented in the event that a significant impact occurs.

APPENDIX A – COORDINATE DATA

Assessed Building Points

The assessed building has a maximum altitude of 76.90m above ground level (AGL). The coordinates outlining the building are given below.

Building Points	Longitude (°)	Latitude (°)	Assessed Height (m AGL)
1	-2.24598	53.47154	76.90
2	-2.24609	53.47166	
3	-2.24670	53.47148	
4	-2.24659	53.47135	

Building Point Coordinates

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