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Urban & Renewables

Desk-Based Satellite Television Interference Assessment

RGRE Ltd, ID Manchester Ltd, & University of Manchester

Plot H, Sister

October 2025

PLANNING SOLUTIONS FOR:

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ADMINISTRATION PAGE

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EXECUTIVE SUMMARY

Overview

Pager Power has been commissioned to investigate the potential impact of a proposed development at Plot H, Sister, in Manchester upon satellite television services in its surrounding area. This report has determined the potential for effects upon satellite television reception by identifying the relevant satellites and receiving equipment, and modelling appropriate diffraction and reflection zones.

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), with a maximum height of 113.25m above ground level.

Assessment Conclusions

The overall conclusions for satellite television reception are:

- The modelled shadow zone for satellite television services is limited to 300m northwest of the proposed development's location;
- 19 buildings have been identified for assessment and are understood to be a mix of residential and commercial uses;
- No significant impacts are predicted as a result of the proposed development upon all 19 of the assessed buildings due to a combination of the following:
    - A lack of observed satellite dishes;
    - Rooftops extending above the 3D shadow zone; and
    - The predicted usage of the building.
- If any report of interference is received from these buildings, it should be investigated;
- A requirement for pre-emptive mitigation has not been identified.

Recommendations

Any reported television interference should be investigated to analyse if interference is attributable to the proposed development. This may be carried out in coordination with a local satellite engineer to survey the existing dish. The investigation can then be considered to determine whether the effect is attributable to the development.

Mitigation

No requirement for pre-emptive mitigation has been identified.

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 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 of a proposed building development upon satellite television services in its surrounding area. This report has determined the potential for effects upon satellite television reception by identifying the relevant satellites and receiving equipment, and modelling appropriate diffraction and reflection zones.

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 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 Site Plan and Location

The proposed development consists of three 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*

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

The three blocks have the following maximum heights:

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

1.4 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*

1.5 3D Building Visualisation

The corner 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

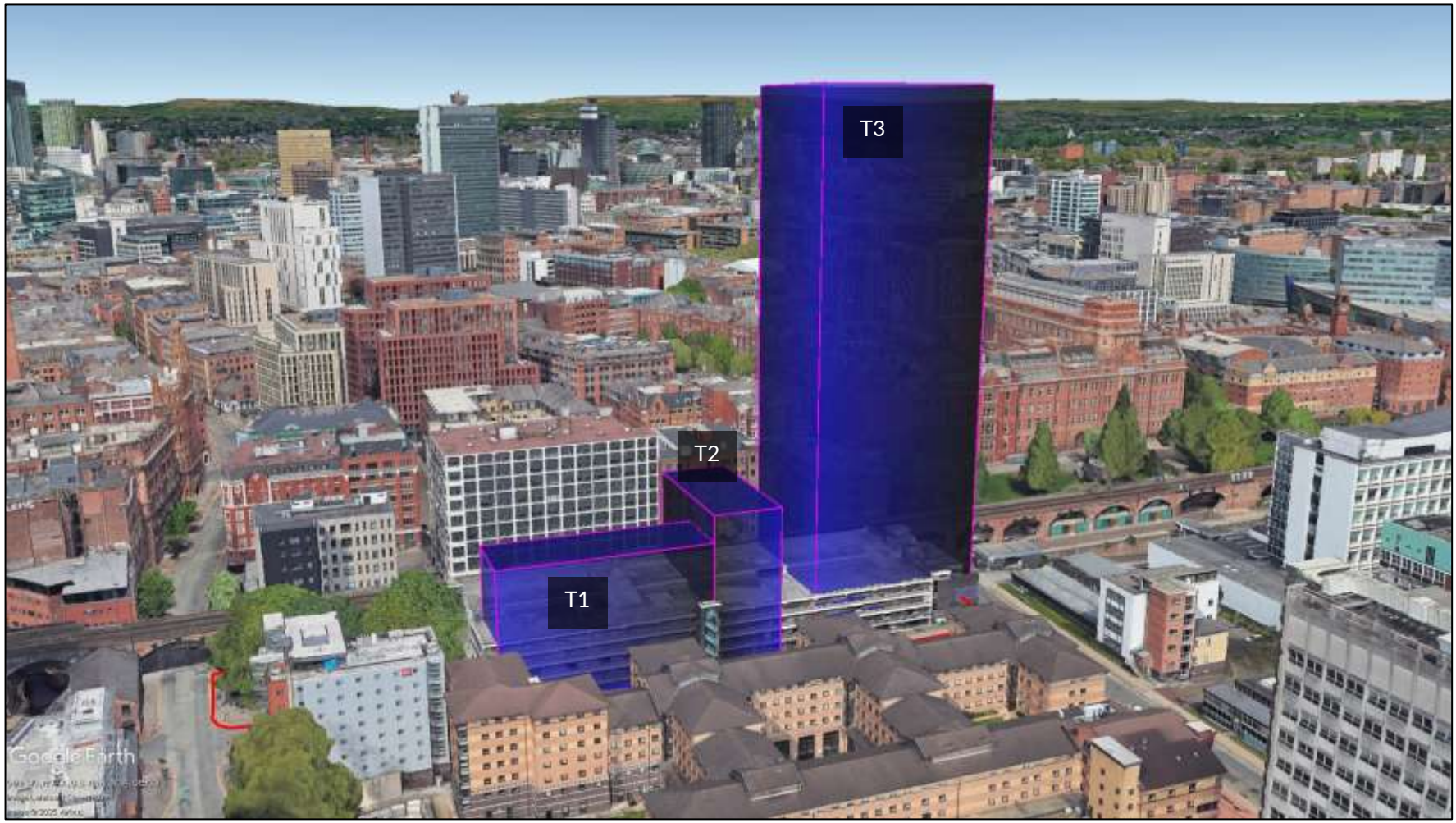


Figure 3 *3D building visualisation*

2 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[3].

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);
- Some tolerance is built into receiving equipment, and it is possible that a satellite signal may still be maintained even if line of sight were blocked.

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[4] 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 4 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.

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

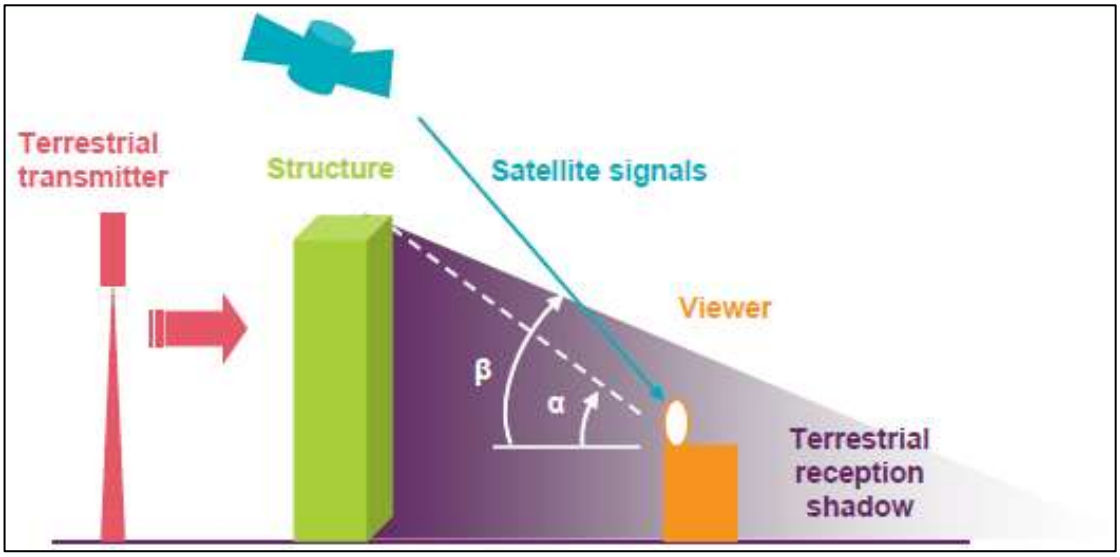


Figure 4 *Satellite reception not affected by a new structure*

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 separately for buildings T1 and T2 (with a maximum height of 30.65m above ground level), and building T3 (with a maximum height of 113.25m above ground level). This is due to the significant difference in the proposed heights of these buildings.

An assumed dish height of 5 metres above ground level has been used considering a conservative review of the buildings in the development's immediate shadow (within 100-300m).

Figures 5 and 6 below and on the following page shows the individual shadow zones for five commonly used satellites and their positions, for buildings T1 and T2, and T3, respectively.

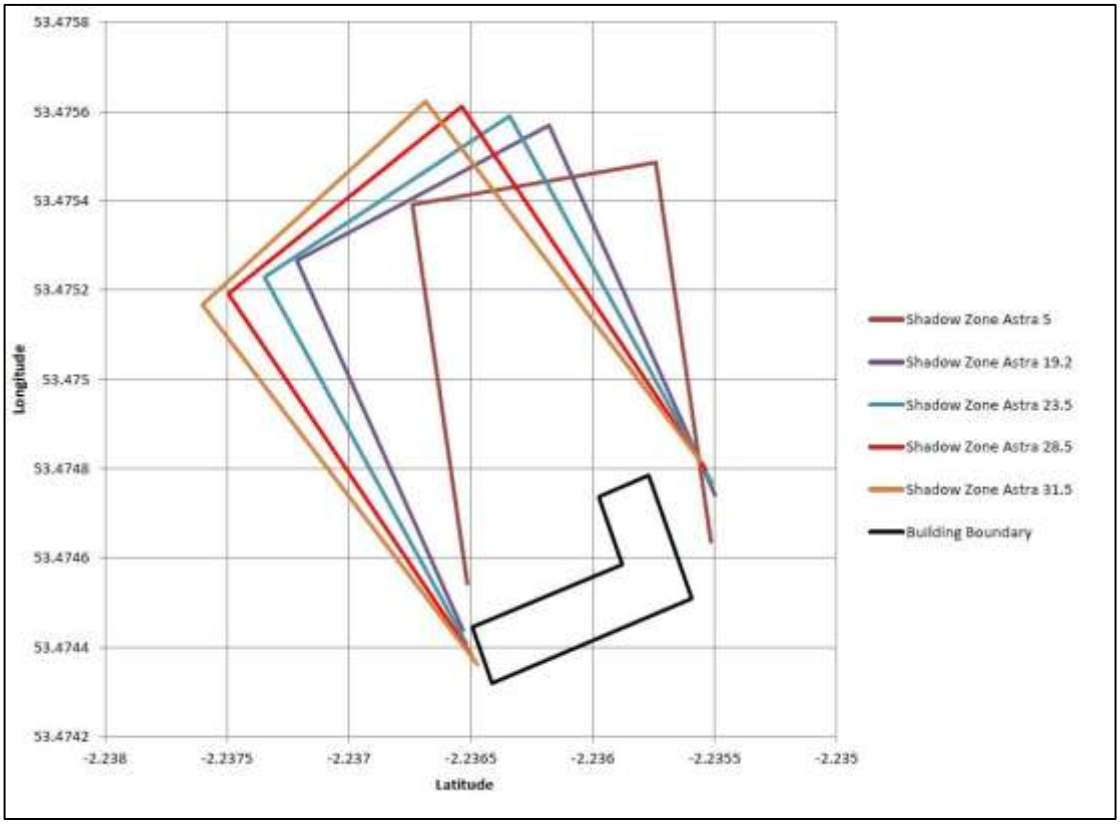


Figure 5 *Satellite television interference zones – Buildings T1 and T2*

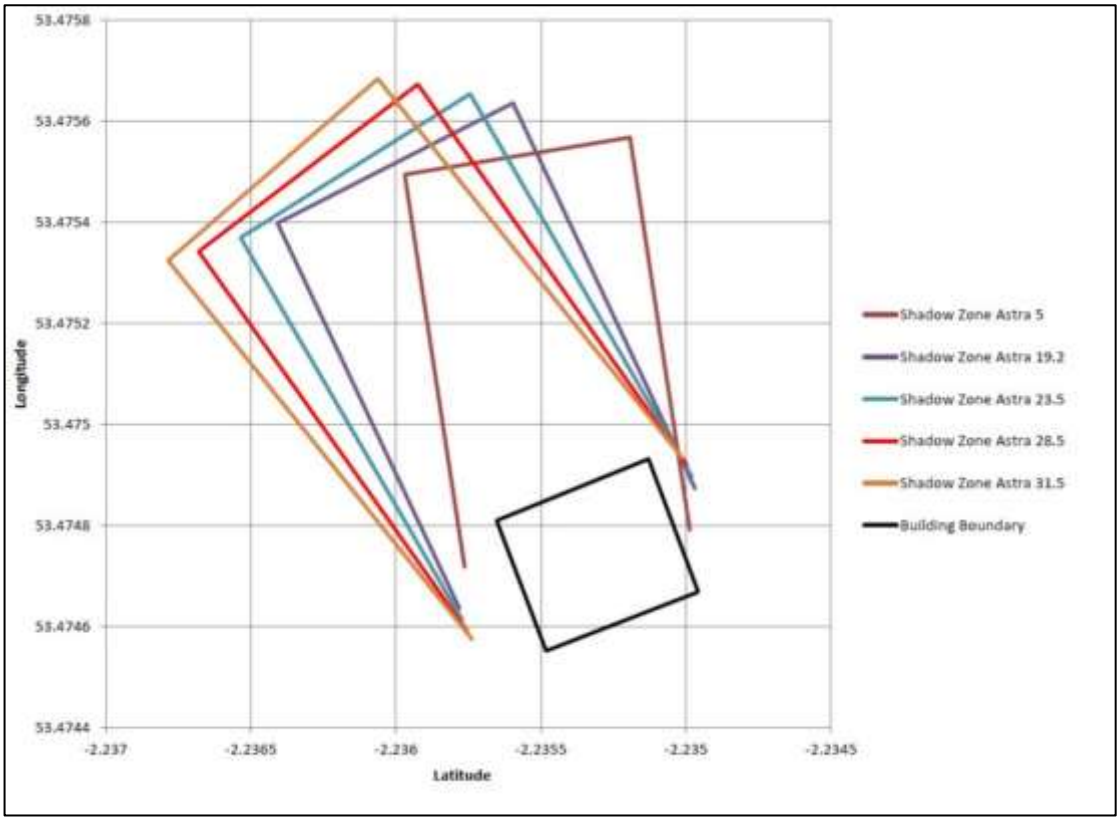


Figure 6 *Satellite television interference zones – Building T3*

Figure 7 on the following page shows the combined satellite shadow zones overlaid onto aerial imagery.

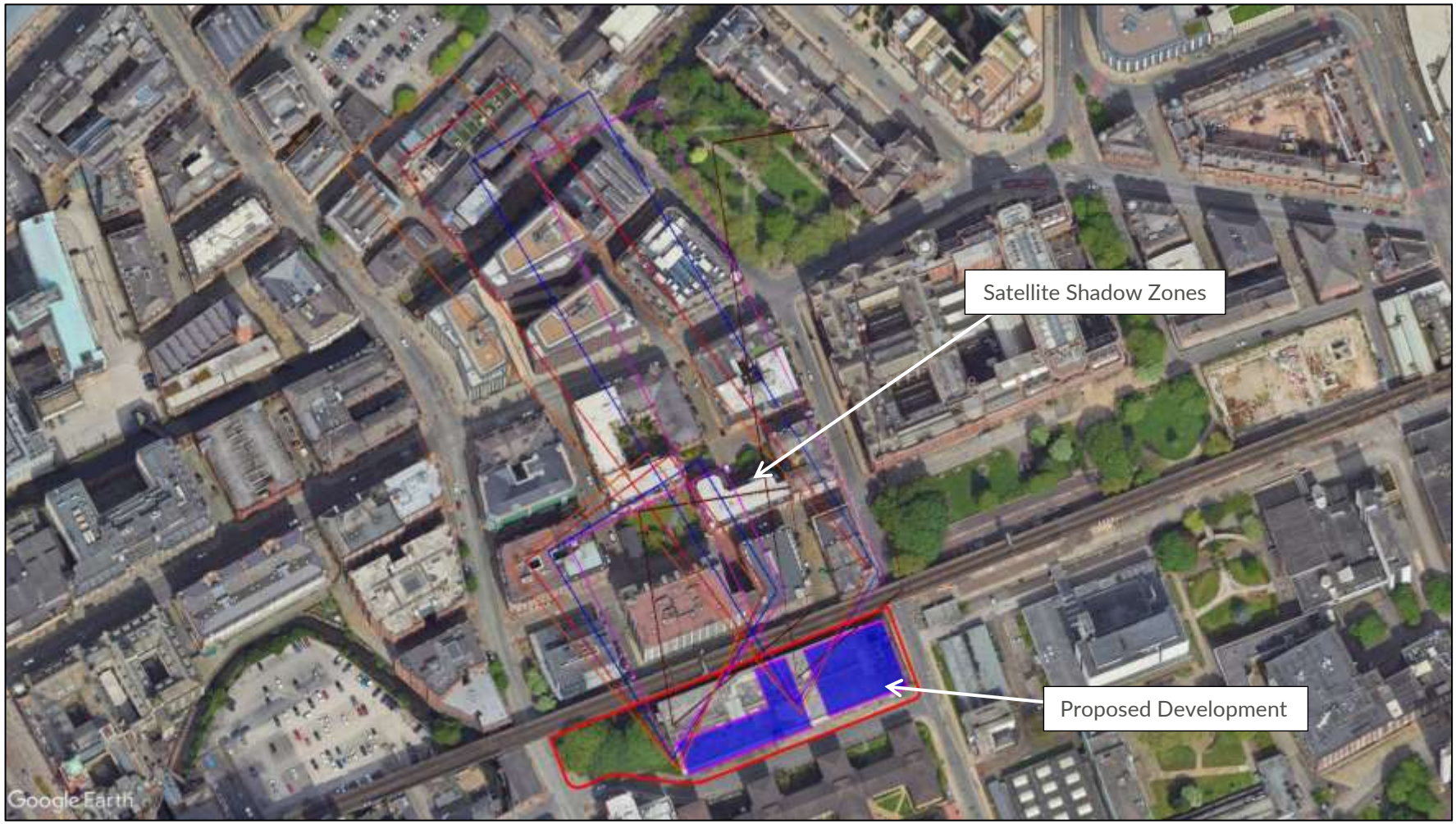


Figure 7 *Satellite television interference zones (aerial image)*

Figure 8 below shows the combined satellite shadow zone overlaid onto a 3D aerial image.



Figure 8 *Satellite television interference zones (3D image)*

The assessment has considered the maximum lateral and vertical extent of the sum of the zones.

3.2 Key Considerations

The following considerations are made when determining the impacts upon a building located within the shadow zone;

- Usage (commercial and residential) – Residential amenity from the use of satellite television is expected to be likely within a residential building. Within commercial buildings, residential amenity is not a primary consideration. As such, greater weight is provided for satellite dishes observed upon residential buildings;
- Whether the roof is vertically within the shadow zone – if a roof extends above the 3D shadow zone, any satellite dishes located upon the rooftop would not be predicted to receive interference;
- The number of observed dishes – buildings without existing dishes are not able to receive interference. The number of dishes observed can inform the potential cost of mitigation, the greater the number of dishes the greater the potential cost;
- Existing developments – where tall buildings exist south of a dish, and between the dish and the proposed development; an observed dish may be shadowed already and thus interference is not predicted to be attributable to the proposed development.

An expert assessment of the likelihood of significant interference as a result of the proposed development is made upon the considerations presented.

3.3 Identified Buildings

Nineteen buildings have been identified within the shadow zone of the proposed development and have been considered for potential interference. Figure 9 below shows the identified buildings within the maximum lateral extent of the shadow zones (shown by the green outline).



Figure 9 *Buildings identified within the shadow zones*

3.4 Assessment of Potential Interference

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

Number	Building name / address	Commercial / Residential	Whether roof extends above the shadow zone	Dishes observed	Predicted likelihood of interference
1	Buildings along Bloom Street	Mixed use, commercial and residential	The entire roof extends above the 3D shadow zone	One	Low
2	Buildings along Richmond Street	Mixed use, commercial and residential	The roof section where satellites are identified is vertically outside the shadow zone	Three	Low
3	The Calico Building	Residential (Apartments)	A very high proportion of the building's roof is expected to exist outside the 3D shadow zone	None	Low
4	The Linton Building	Residential (Apartments)	The entire roof extends above the 3D shadow zone	None	Low
5	2 Brazil Street	Residential (Apartments)	Approximately half of the building's roof is expected to be vertically within the shadow zone	None	Low
6	The Carding Building	Residential (Apartments)	Approximately half of the building's roof is expected to be vertically within the shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Whether roof extends above the shadow zone	Dishes observed	Predicted likelihood of interference
7	36-38 Whitworth St	Mixed use, commercial and residential	The building's roof is expected to be vertically within the shadow zone	None	Low
8	Manchester College Shena Simon Campus	Commercial (School Building)	The entire roof extends above the 3D shadow zone	None	Low
9	Bombay House, 59 Whiteworth Street	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
10	Sackville Place	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
11	University of Manchester, Sackville St. Building	Commercial (University Department)	A high proportion of the building's roof is expected to exist outside the 3D shadow zone	None	Low
12	Dwell, 121 Princess Street	Residential (Student Accommodation)	The entire roof extends above the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Whether roof extends above the shadow zone	Dishes observed	Predicted likelihood of interference
13	50 Granby Row	Commercial (Office)	Approximately half of the building's roof is expected to be vertically within the shadow zone	None	Low
14	36 Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the 3D shadow zone	None	Low
15	Velvet House, Sackville Street	Residential (Apartments)	The building's roof is expected to be vertically within the 3D shadow zone	None	Low
16	Salisbury House, 67 Granby Row	Residential (Apartments)	A high proportion of the building's roof is expected to exist outside the 3D shadow zone	None	Low
17	UNCLE Manchester, 65 Granby Row	Residential (Apartments)	A high proportion of the building's roof is expected to exist outside the 3D shadow zone	None	Low
18	Granby House, Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Whether roof extends above the shadow zone	Dishes observed	Predicted likelihood of interference
19	72 Sackville Street	Commercial (Office)	The building's roof is expected to be vertically within the 3D shadow zone	None	Low

Table 1 *Predicted impacts upon identified buildings*

3.5 Desk-Based Review of Available Imagery

Figures 10 and 11 on the following pages present Google Streetview imagery of the identified satellite dishes.



Figure 10 *Streetview imagery of observed satellite dish upon Building 1*



Figure 11 *Streetview imagery of observed satellite dishes upon Building 2*

3.6 Results Discussion

For buildings 1 and 2, those along Bloom Street and Richmond Street, satellite dishes have been identified. These are located upon the roofs of the buildings and are predicted to exist above the modelled 3D shadow zones. As such, interference as a result of the proposed development is not predicted and mitigation is not recommended.

For buildings 3 to 19, no satellite dishes have been observed. Where no satellite dishes are present, no impact can occur. Satellites dishes may exist on rooftops which cannot be observed from a ground-based observer. As such, a low likelihood of interference is predicted with respect to these buildings and pre-emptive mitigation is not recommend.

Overall, no significant effects upon satellite reception as a result of the proposed development is predicted. If any report of interference is received from these buildings, it should be investigated. Pre-emptive mitigation is not recommended.

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. A requirement for pre-emptive mitigation 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 technology, such as internet services or terrestrial television broadcasts.

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 reception are:

- The modelled shadow zone for satellite television services is limited to 300m northwest of the proposed development's location;
- 19 buildings have been identified for assessment and are understood to be a mix of residential and commercial uses;
- No significant impacts are predicted as a result of the proposed development upon all 19 of the assessed buildings due to a combination of the following:
    - A lack of observed satellite dishes;
    - Rooftops extending above the 3D shadow zone; and
    - The predicted usage of the building.
- If any report of interference is received from these buildings, it should be investigated;
- A requirement for pre-emptive mitigation has not been identified.

5.2 Recommendations

Any reported television interference should be investigated to analyse if interference is attributable to the proposed development. This may be carried out in coordination with a local satellite engineer to survey the existing dish. The investigation can then be considered to determine whether the effect is attributable to the development.

5.3 Mitigation

No requirement for pre-emptive mitigation has been identified.

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 coordinates outlining the building are given below. Maximum building elevations are presented in Section 1.

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.235877	53.474585	3	-2.236412	53.47432
2	-2.235798	53.474461	4	-2.236494	53.474445

Building coordinates – T1

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.235798	53.474461	3	-2.235773	53.474783
2	-2.235594	53.474509	4	-2.235977	53.474737

Building coordinates – T2

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.235653	53.474811	3	-2.234957	53.474671
2	-2.235129	53.474932	4	-2.235483	53.474552

Building coordinates – T3

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