PAGERPOWER
Urban & Renewables

Desk-Based Satellite Television Interference Assessment

Cumming Group

Weston and Pendulum

December 2025







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ADMINISTRATION PAGE

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1	3rd December 2025	Initial issue
2	11th December 2025	Updated site plans
3	16th December 2025	Administrative revisions

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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 78 Sackville Street, M1 3BB in Manchester.

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.

Assessment Conclusions

The overall conclusions for satellite television reception are:

- The modelled shadow zone for satellite television services is limited to 330m northwest of the proposed development's location;
- 26 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 25 of the assessed buildings due to a combination of the following:
    - A lack of observed satellite dishes;
    - Rooftops extending above the 3D shadow zone;
    - Dishes being shadowed by existing buildings; and
    - The predicted usage of the building.
- For the remaining building, cannot be conclusively ruled out. If reports of interference are received from these buildings, it should be investigated;
- A requirement for pre-emptive mitigation has not been identified.

Recommendations

Any reported satellite 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. The proposed development is located 78 Sackville Street, M1 3BB in Manchester.

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.

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 Details

The red line boundary and building footprints[1] of the site is shown in Figure 1 below. The proposed development will consist of four buildings; two within Phase A to the east and two within Phase B to the west, and will comprise purpose-built student accommodation.

The project description is as follows:

(a) *Partial removal of existing structures and erection of two buildings comprising purpose-built student accommodation (sui generis), one of 50 storeys and one of 17 storeys with an 8-storey link, together with associated amenity space, external landscaping, highways works, and change of use of the Pendulum Hotel to purpose-built student accommodation; and*

(b) *Removal of remaining existing structures and erection of two buildings comprising purpose-built student accommodation (sui generis), one of 33 storeys and one of part-24 and part-8 storeys with a 1-storey link, together with associated amenity space, external landscaping, and highways works.*

The maximum heights[2] of the buildings are presented below:

- Phase A, north tower – 56.6m above ground level (agl);
- Phase A, south tower – 154.0m agl;
- Phase B, east tower – 76.25m agl;
- Phase B, west tower – 102.8m agl.

[1] Source: 10346-SHA-Z0-A-B5D8-G100-PL-XX-002.pdf (cropped)
[2] Source: 10346-SHA-Z0-A-B5D8-G100-EL-EE-001.pdf

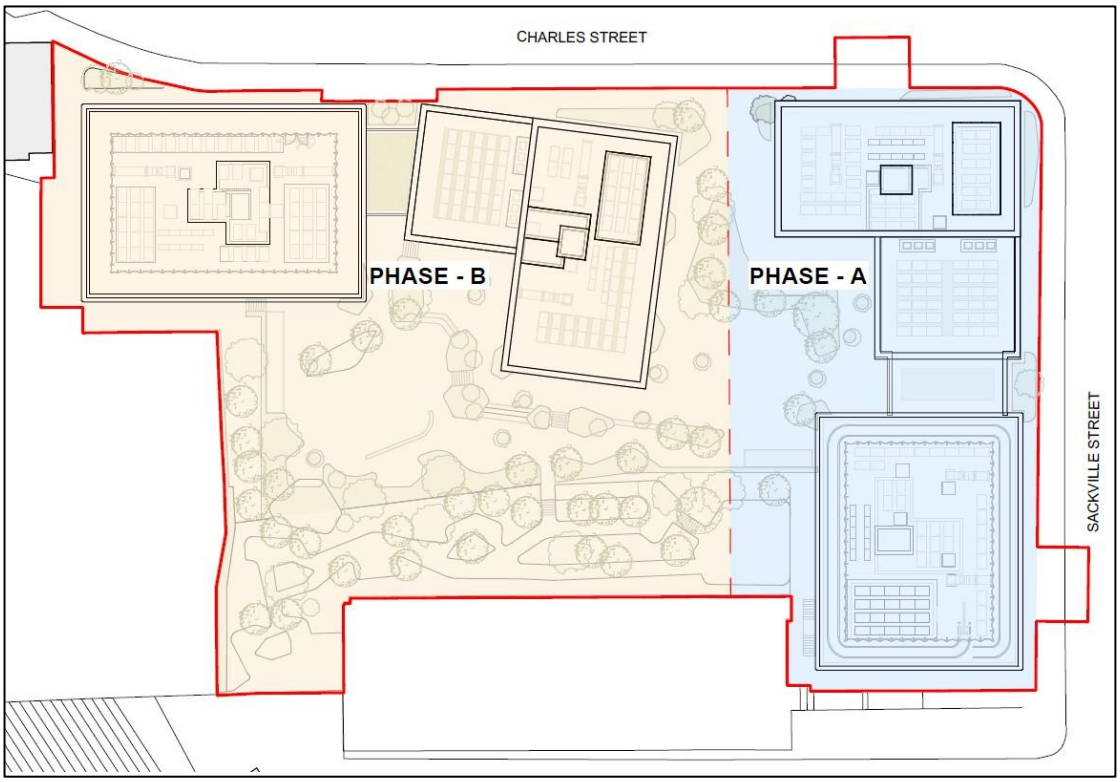


Figure 1 *Red line boundary and building footprints*

Figure 2 on the following page shows the red line boundary and building footprint (pink outline), overlaid upon aerial imagery.

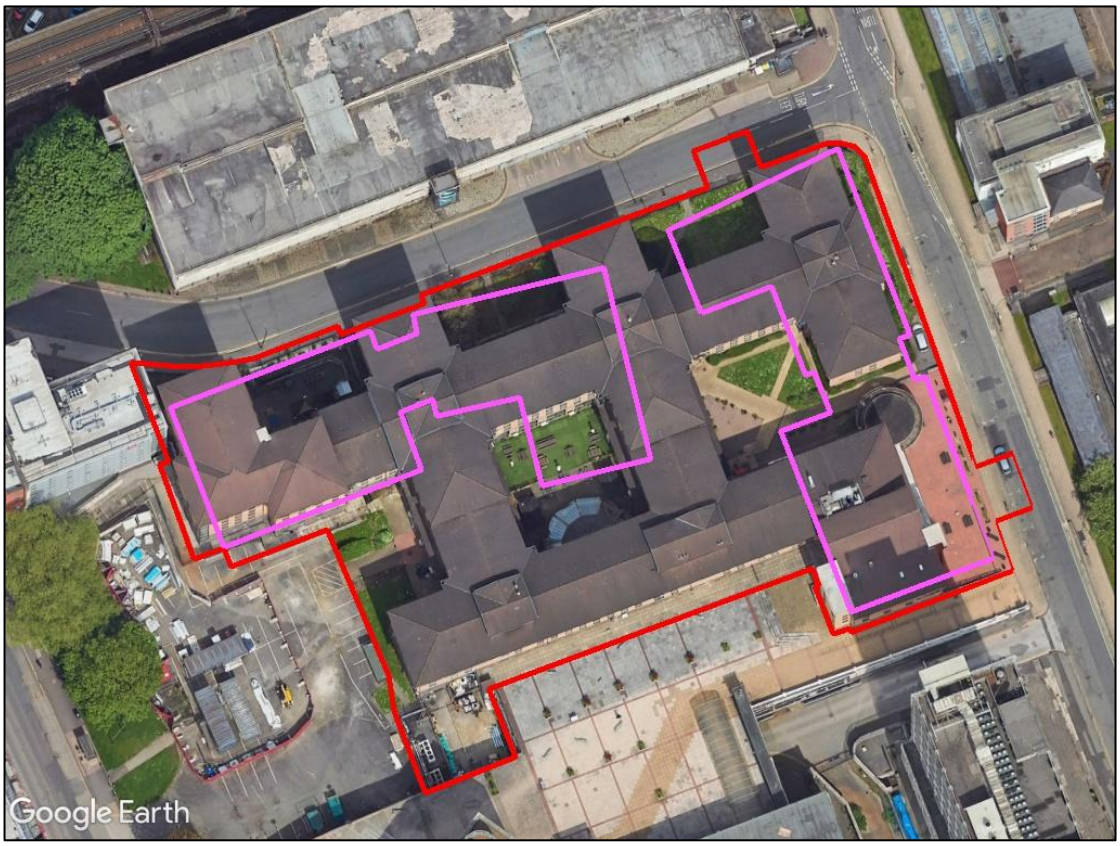


Figure 2 *Building footprint*

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.



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.

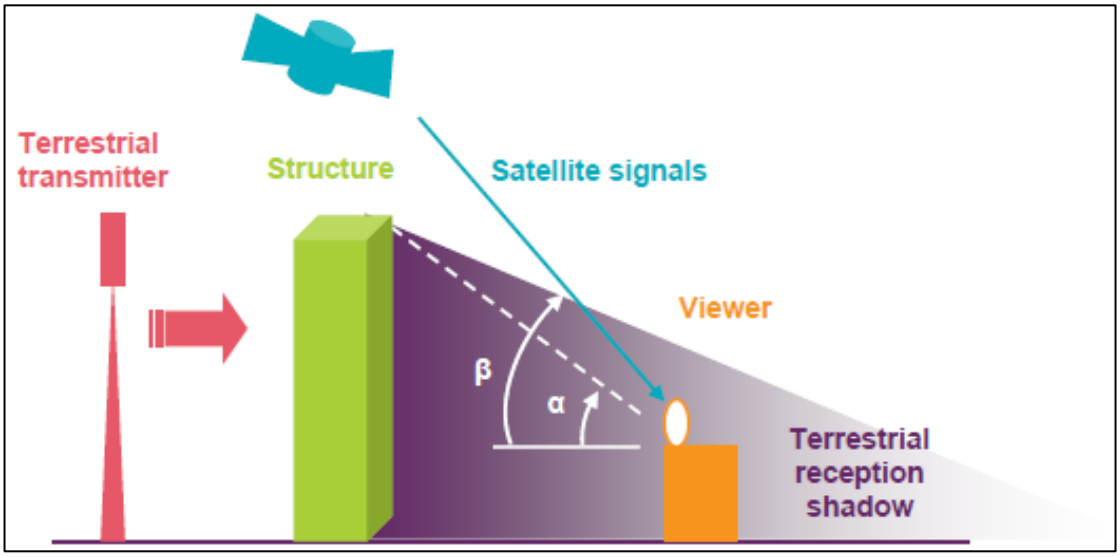


Figure 4 *Satellite reception not affected by a new structure*

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 each of the four buildings. This is due to the significant difference in the proposed heights of these buildings. The lower rise sections which connect the two Phase A building, and the two Phase B buildings, have not been considered as the shadow zones for the towers are predicted to encompass a greater area due to the relative heights and the satellite angles considered.

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).

Figure 5 below shows the individual shadow zones for five commonly used satellites and their positions, for the northern tower of Phase A. The shadow zones for each of the four buildings are constructed in a like manner.

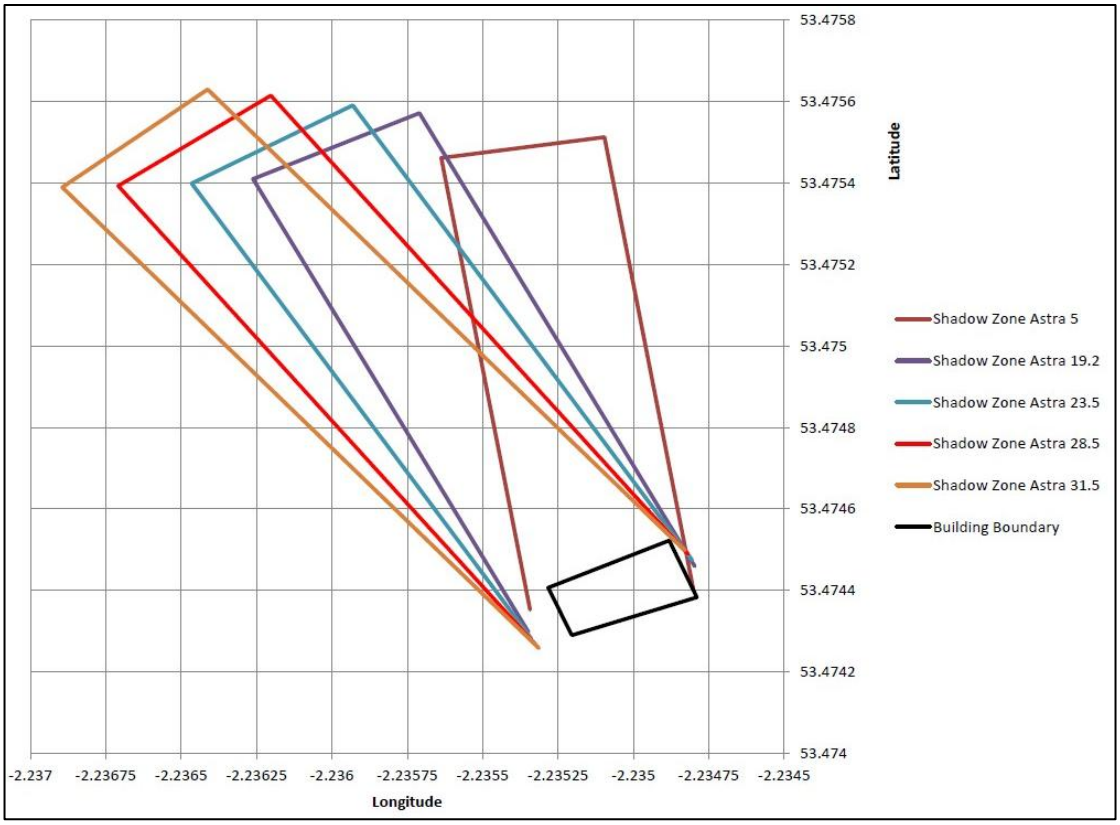


Figure 5 *Satellite television interference zones – Northern tower of Phase A*

Figure 6 on the following page shows the combined satellite shadow zones overlaid onto aerial imagery.

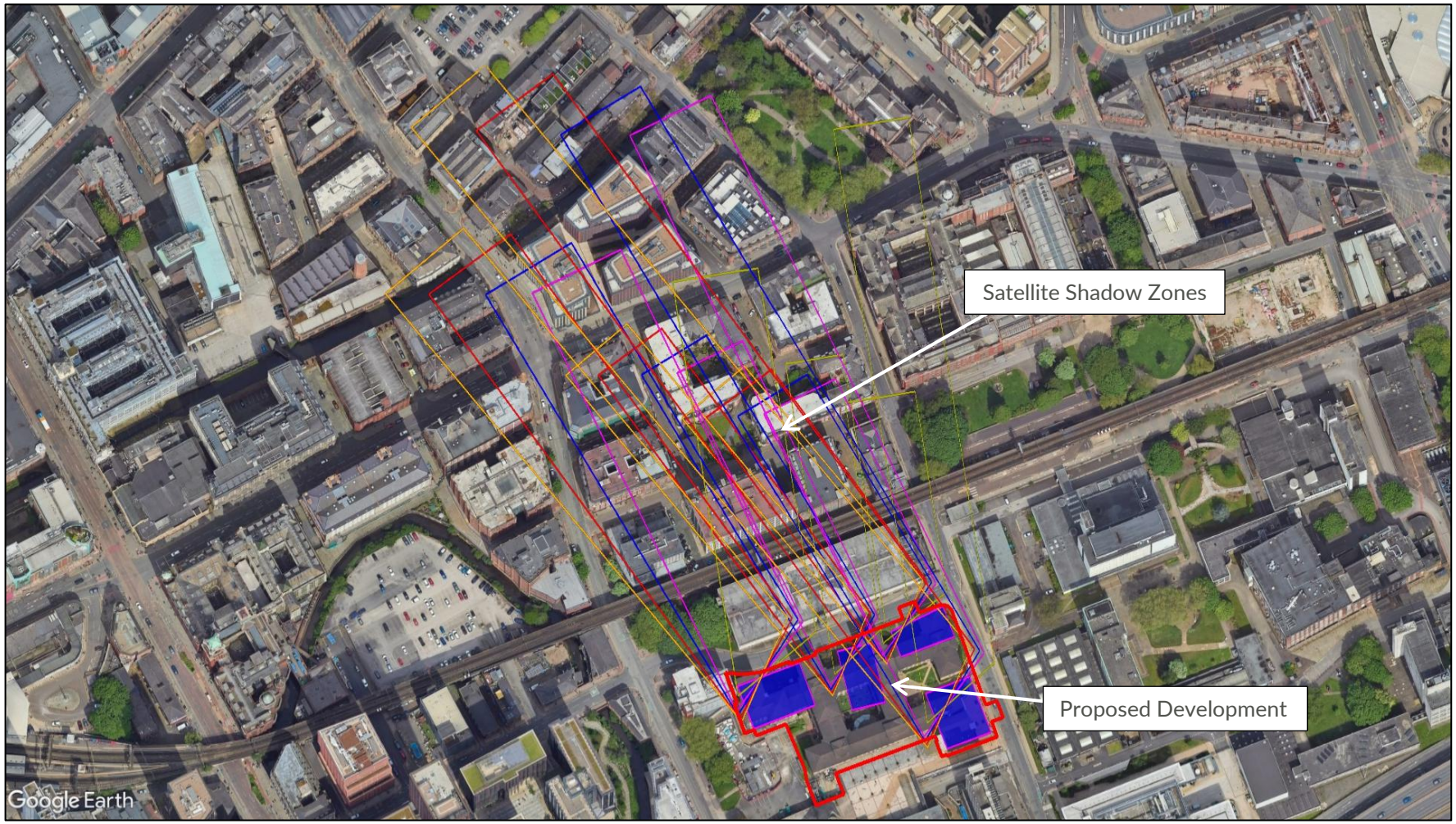


Figure 6 *Satellite television interference zones (aerial image)*

Figure 7 below shows the combined satellite shadow zone overlaid onto a 3D aerial image.

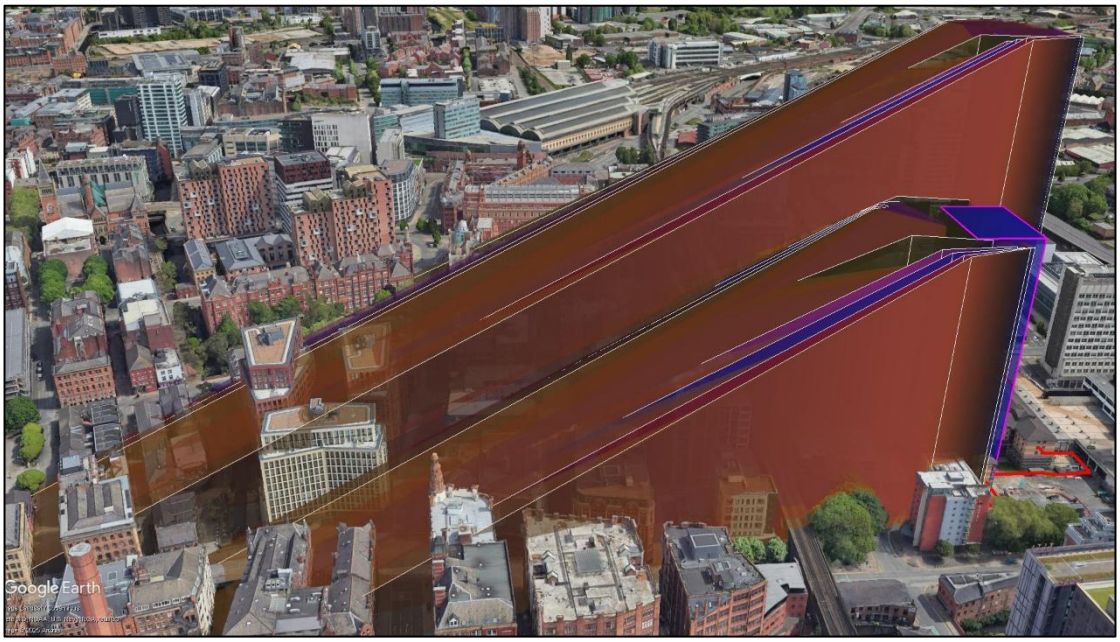


Figure 7 *Satellite television interference zones (3D image)*

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 extent of mitigation, the greater the number of dishes the greater the potential extent;
- 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 may not be 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

Twenty-nine buildings have been identified within the shadow zone of the proposed development and have been considered for potential interference. Figure 8 below shows the identified buildings within the maximum lateral extent of the shadow zones (shown by the green outline).

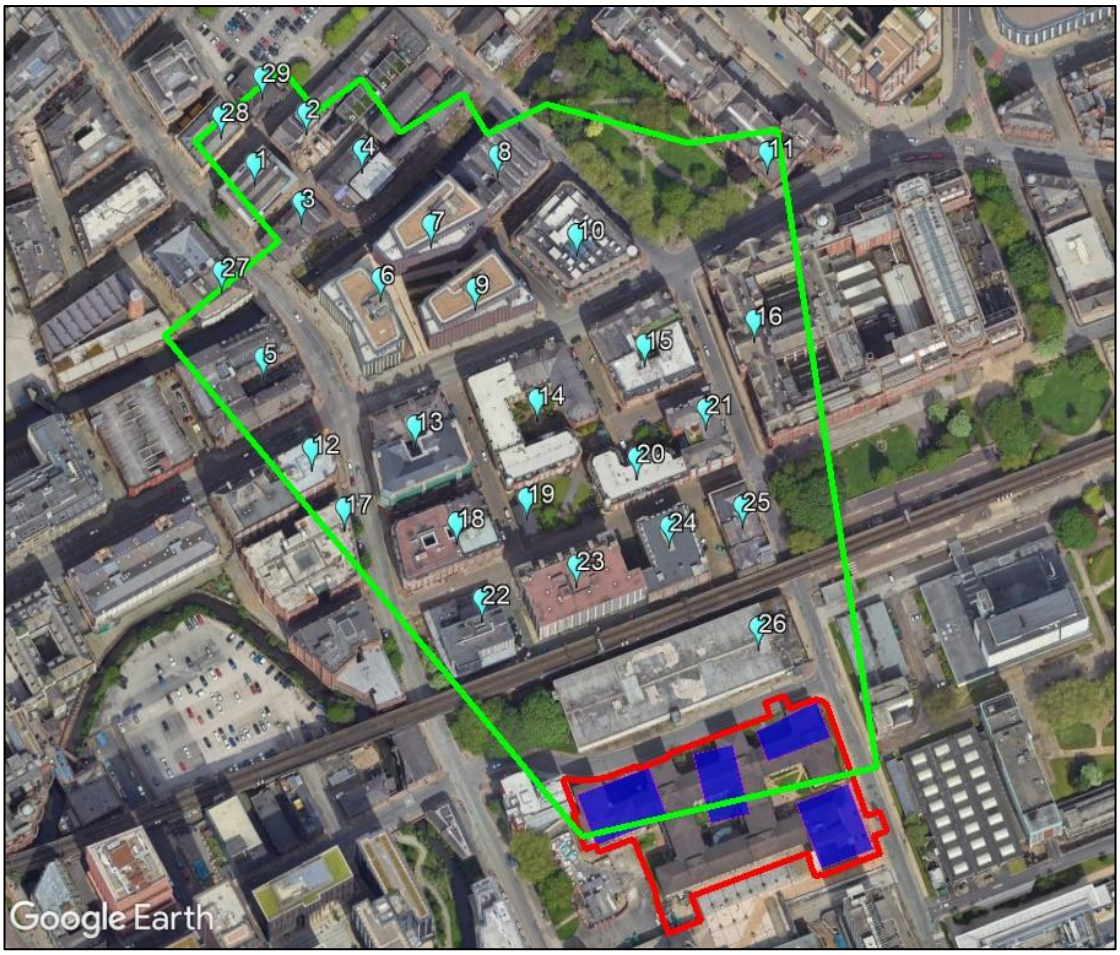


Figure 8 *Buildings identified within the shadow zones*

Building 27, 28, and 29 have been added to the analysis following an increase in the maximum height of the proposed development since the initial issue of the report.

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, usage type, and available imagery.

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
1	63 Bloom Street	Mixed use, commercial and residential	The entire roof extends above the 3D shadow zone	None	Low
2	Buildings along Bloom Street	Mixed use, commercial and residential	The entire roof extends above the 3D shadow zone	None	Low
3	Buildings along Canel Street	Mixed use, commercial and residential	The building's roof is expected to be vertically within the shadow zone	None	Low
4	Buildings along Richmond Street	Mixed use, commercial and residential	Approximately half of the building's roof is expected to be vertically within the shadow zone	None	Low
5	Whitworth Locke Hotel, 74 Princess Street	Commercial (Hotel)	A high proportion of the building's roof extends above the 3D shadow zone	None	Low
6	The Calico Building	Residential (Apartments)	Approximately half of the building's roof is expected to exist outside the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
7	The Linton Building	Residential (Apartments)	The entire roof extends above the 3D shadow zone	None	Low
8	2 Brazil Street	Residential (Apartments)	A high proportion of the building's roof extends above the 3D shadow zone	None	Low
9	The Carding Building	Residential (Apartments)	A high proportion of the building's roof is expected to be vertically within the shadow zone	None	Low
10	36-38 Whitworth St	Mixed use, commercial and residential	A high proportion of the building's roof is expected to be vertically within the shadow zone	None	Low
11	Manchester College Shena Simon Campus	Commercial (School Building)	The entire roof extends above the 3D shadow zone	None	Low
12	80 Princess Street	Residential (Apartments)	A high proportion of the building's roof extends above the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
13	Victoria House, 119 Princess Street	Mixed use, commercial and residential	The building's roof is expected to be vertically within the shadow zone Identified dishes are predicted to currently be shadowed by buildings 18 and 23	Two	Low
14	Bombay House, 59 Whiteworth Street	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
15	Sackville Place	Residential (Apartments)	A high proportion of the building's roof is expected to be vertically within the shadow zone	None	Low
16	University of Manchester, Sackville St. Building	Commercial (University Department)	Approximately half of the building's roof is expected to be vertically within the shadow zone	None	Low
17	Asia House, 82 Princess Street	Residential (Apartments)	A high proportion of the building's roof is expected to exist outside the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
18	Dwell, 121 Princess Street	Residential (Student Accommodation)	The building's roof is expected to be vertically within the shadow zone	None	Low
19	50 Granby Row	Commercial (Office)	The building's roof is expected to be vertically within the shadow zone	None	Low
20	36 Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
21	Velvet House, Sackville Street	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
22	Salisbury House, 67 Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	One	Medium
23	UNCLE Manchester, 65 Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
24	Granby House, Granby Row	Residential (Apartments)	The building's roof is expected to be vertically within the shadow zone	None	Low
25	72 Sackville Street	Commercial (Office)	The building's roof is expected to be vertically within the shadow zone	None	Low
26	78 Sackville Street	Commercial (Retail and Entertainment)	The building's roof is expected to be vertically within the shadow zone Identified dish is predicted to currently be shadowed by buildings the existing building at the development location: Weston Hall	One	Low
27	56 Princess Street	Commercial (Office)	The entire roof extends above the 3D shadow zone	None	Low
28	Princess House, 105-107 Princess Street	Commercial (Office)	The entire roof extends above the 3D shadow zone	None	Low

Number	Building name / address	Commercial / Residential	Commentary	Dishes observed	Predicted likelihood of interference
29	94-98 Bloom Street	Commercial (Hospitality)	The entire roof extends above the 3D shadow zone	None	Low

Table 1 *Predicted impacts upon identified buildings*

3.5 Desk-Based Review of Available Imagery

Figures 9 to 11 on the following pages present Google Streetview imagery of the identified satellite dishes.



Figure 9 *Streetview imagery of observed satellite dish upon Building 13*



Figure 10 *Streetview imagery of observed satellite dishes upon Building 22*

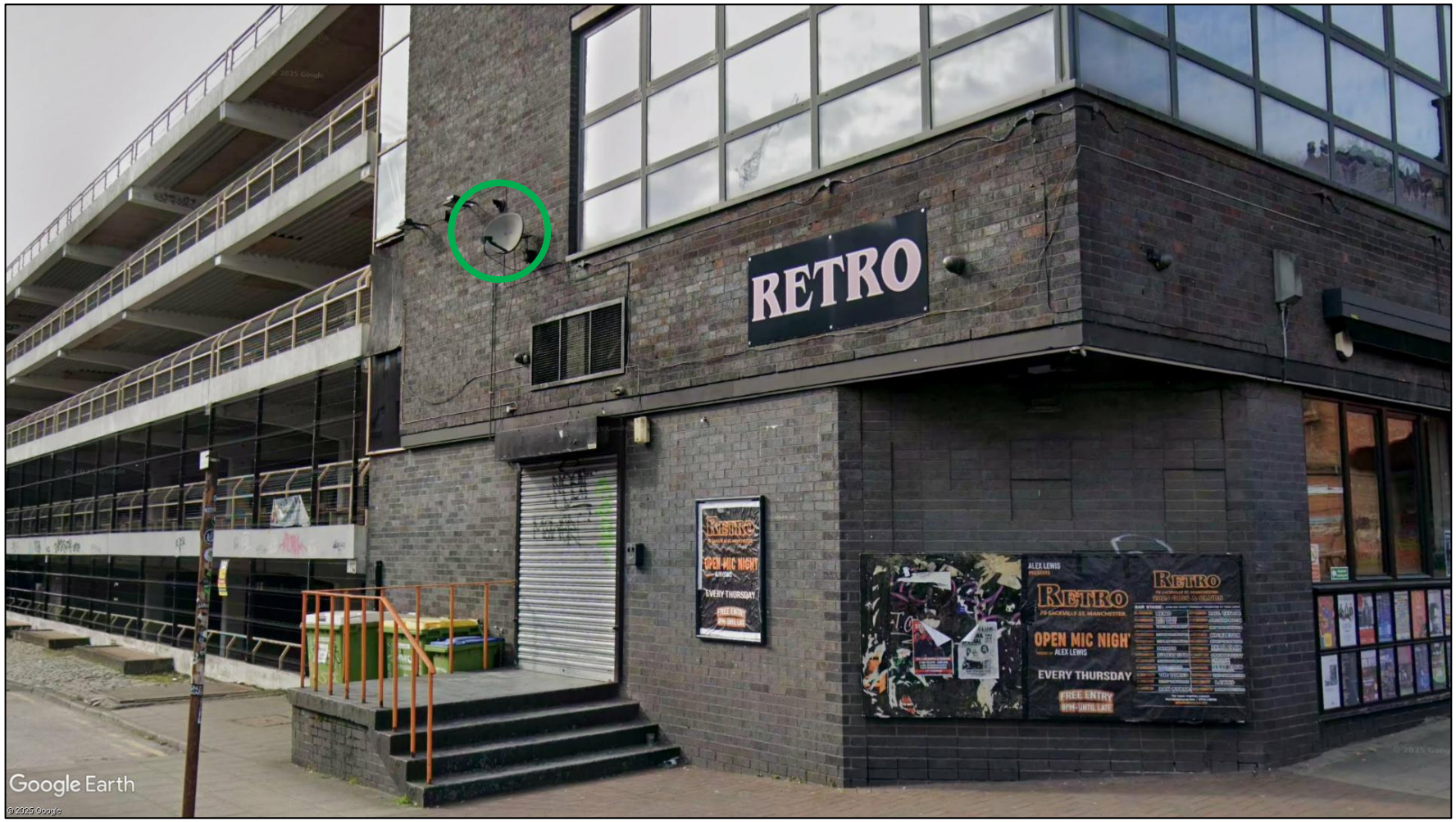


Figure 11 *Streetview imagery of observed satellite dishes upon Building 26*

3.6 Results Discussion

For buildings 13 and 26, satellite dishes have been identified within the shadow zone of the proposed development. However, the dishes are predicted to currently be shadowed by existing tall buildings to their south. The shadow zones of these buildings have been mapped and found to encompass the location of the dishes. Therefore, no significant change in reception as a result of the proposed development is predicted. Were degradation of signal to be reported post-construction, this should be investigated[5] and suitably mitigated if found to be attributable to the proposed development. A low likelihood of interference is predicted and pre-emptive mitigation is not recommended.

For building 22, one satellite dish has been observed within the shadow zone. Interference effects are considered possible. If interference from the proposed development is reported post-construction, it is recommended to be investigated[3] and suitably mitigated if found to be attributable to the proposed development. Pre-emptive mitigation is not recommended.

For the remaining buildings, 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, the potential for interference cannot be conclusively ruled out. As such, a low likelihood of interference is predicted with respect to these buildings and pre-emptive mitigation is not recommended.

Considering the above, no significant impacts are predicted upon satellite television reception at 25 of the 26 assessed buildings. The potential for interference upon one building (building 22) cannot be conclusively ruled out. If reports of interference are received from these buildings, it should be investigated. Pre-emptive mitigation is not recommended.

[5] This may entail a local satellite engineer undertaking a survey and providing input on an appropriate solution.

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 330m northwest of the proposed development's location;
- 26 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 25 of the assessed buildings due to a combination of the following:
    - A lack of observed satellite dishes;
    - Rooftops extending above the 3D shadow zone;
    - Dishes being shadowed by existing buildings; and
    - The predicted usage of the building.
- For the remaining building, cannot be conclusively ruled out. If reports of interference are received from these buildings, it should be investigated;
- A requirement for pre-emptive mitigation has not been identified.

5.2 Recommendations

Any reported satellite 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 modelled coordinates outlining the building are given below.

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.23520	53.47429	3	-2.23488	53.47452
2	-2.23479	53.47438	4	-2.23528	53.47441

Building coordinates – Phase A North Tower

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.23451	53.47394	3	-2.23502	53.47412
2	-2.23467	53.47420	4	-2.23485	53.47387

Building coordinates – Phase A South Tower

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.23544	53.47435	3	-2.23558	53.47405
2	-2.23570	53.47432	4	-2.23532	53.47408

Building coordinates – Phase B East Tower

Point	Longitude (°)	Latitude (°)	Point	Longitude (°)	Latitude (°)
1	-2.23599	53.47426	3	-2.23634	53.47396
2	-2.23647	53.47416	4	-2.23587	53.47407

Building coordinates – Phase B West Tower

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