

Technical Aerodrome Safeguarding Assessment

Alberton House

Bruntwood

29th June 2022

PLANNING SOLUTIONS FOR:

- Solar
- Defence
- Airports
- Telecoms
- Buildings
- Radar
- Railways
- Wind
- Mitigation

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ADMINISTRATION PAGE

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Issue	Date	Detail of Changes
1	26 th May 2022	Initial issue
2	22 nd June 2022	Updated Plans
3	29 th June 2022	Updated Plans

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EXECUTIVE SUMMARY

Report Purpose

Pager Power has been commissioned to investigate the potential impact of the proposed Alberton House building development upon aviation infrastructure in the surrounding area. The proposed development is located on St Mary's Parsonage in central Manchester and will have a maximum height of 117.5 metres above ordnance datum.

Conclusions

Manchester Airport Obstacle Limitation Surfaces (OLS)

The proposed development lies beneath the Outer Horizontal Surface (OHS) for Manchester Airport. The proposed development is clear of the OHS by a minimum margin of 89.1928m. No physical safeguarding concerns are therefore predicted with respect to the OLS from the building structure.

Manchester Airport Secondary Surveillance Radar (SSR)

It is expected that many of the line-of-sight paths from the Manchester Airport SSR towards the proposed development will be blocked by intervening buildings and terrain, particularly for the parts of the proposed development that sit low above ground level. Although some parts of the proposed development may be within radar line of sight, significant impacts on radar performance for buildings at this range are unlikely, particularly in such a built-up area with many other existing buildings. Taller buildings within the city centre are already expected to produce shadowing effects on the same bearing from the radar.

NATS responded to Pager Power's consultation request with confirmation that interference issues are not envisaged with the proposed development.

Crane Usage and Aviation Lighting

Based on the maximum height of the proposed building development, cranes will not breach the OHS as long as they extend no more than 89 metres above the finished height of the building – including when parked. No physical safeguarding concerns are therefore predicted with respect to the OLS from the cranes. Proposed heights and positions of the cranes should be identified as soon as possible.

The Civil Aviation Authority (CAA) has clear aviation lighting requirements for any obstacles that are 150m or more above ground level. The highest point of the proposed development is approximately 80m above ground level. This does not meet the height at which lighting is a requirement. Any cranes used on site are therefore very unlikely to meet the height at which lighting is a requirement. This should be confirmed once the heights and positions of the cranes are determined.

Next Steps

The findings of this report should be shared with Manchester Airport, this should form the basis of further engagement with the airport's safeguarding team.

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ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 51 countries internationally.

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 INTRODUCTION

1.1 Overview

Pager Power has been commissioned to investigate the potential impact of the proposed Alberton House building development upon aviation infrastructure in the surrounding area. The proposed development is located on St Mary's Parsonage in central Manchester and will have a maximum height of 117.5 metres above ordnance datum.

Building developments have the potential to affect aviation operations in numerous ways. The most common impacts relate to building developments as physical obstructions both to aircraft and wireless signals used for radar and radio systems. This assessment has identified and assessed all of the key aviation constraints for the proposed development. In detail the report includes:

- Proposed development details.
- Manchester Airport Details.
- Obstacle limitation surfaces (OLS) assessment for Manchester Airport.
- Line of sight assessment for the Manchester Airport Secondary Surveillance Radar (SSR).
- High-level comments regarding crane usage and lighting requirements.
- Overall conclusions and recommendations.

1.2 Proposed Development Details

The proposed development redline boundary is shown in Figure 1¹ on the following page.

¹ ALBH-EPR-ZZ-XX-TP-A-01-0112 (cropped).

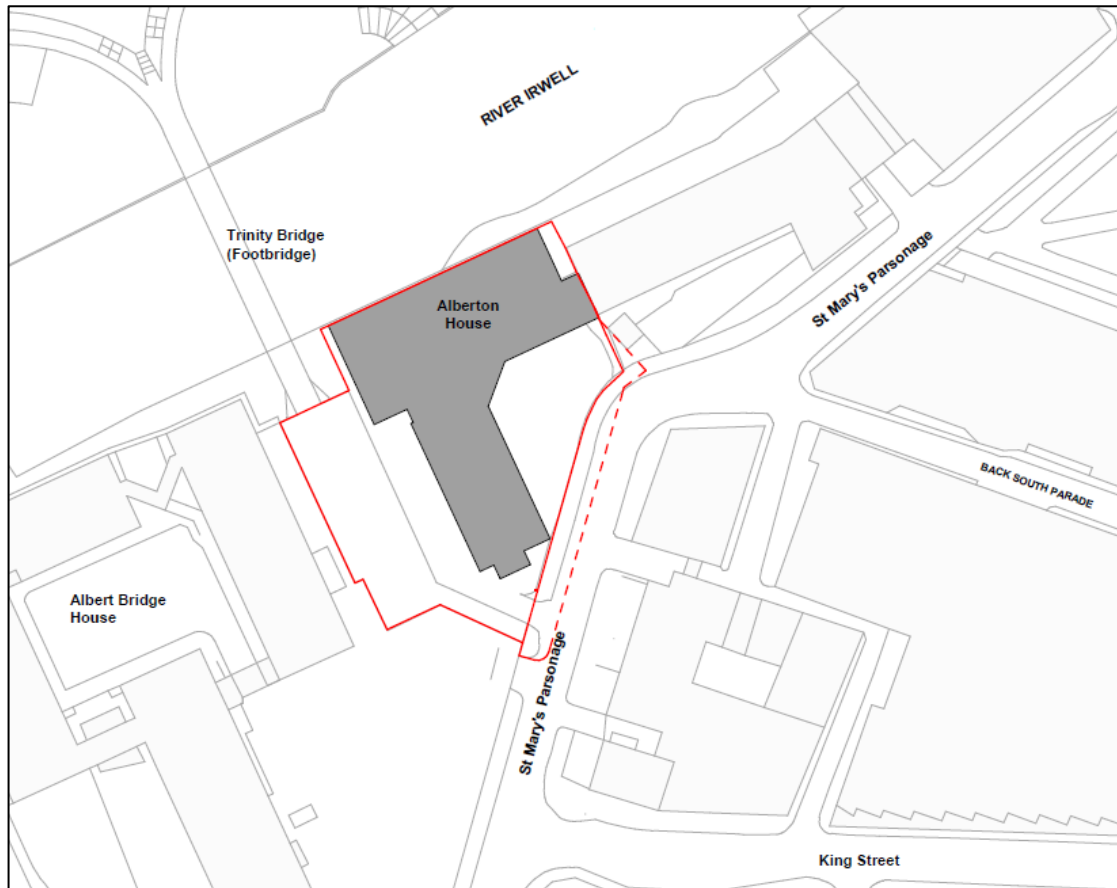


Figure 1 Proposed development redline boundary

Figure 2² below shows the west elevation of the proposed development.

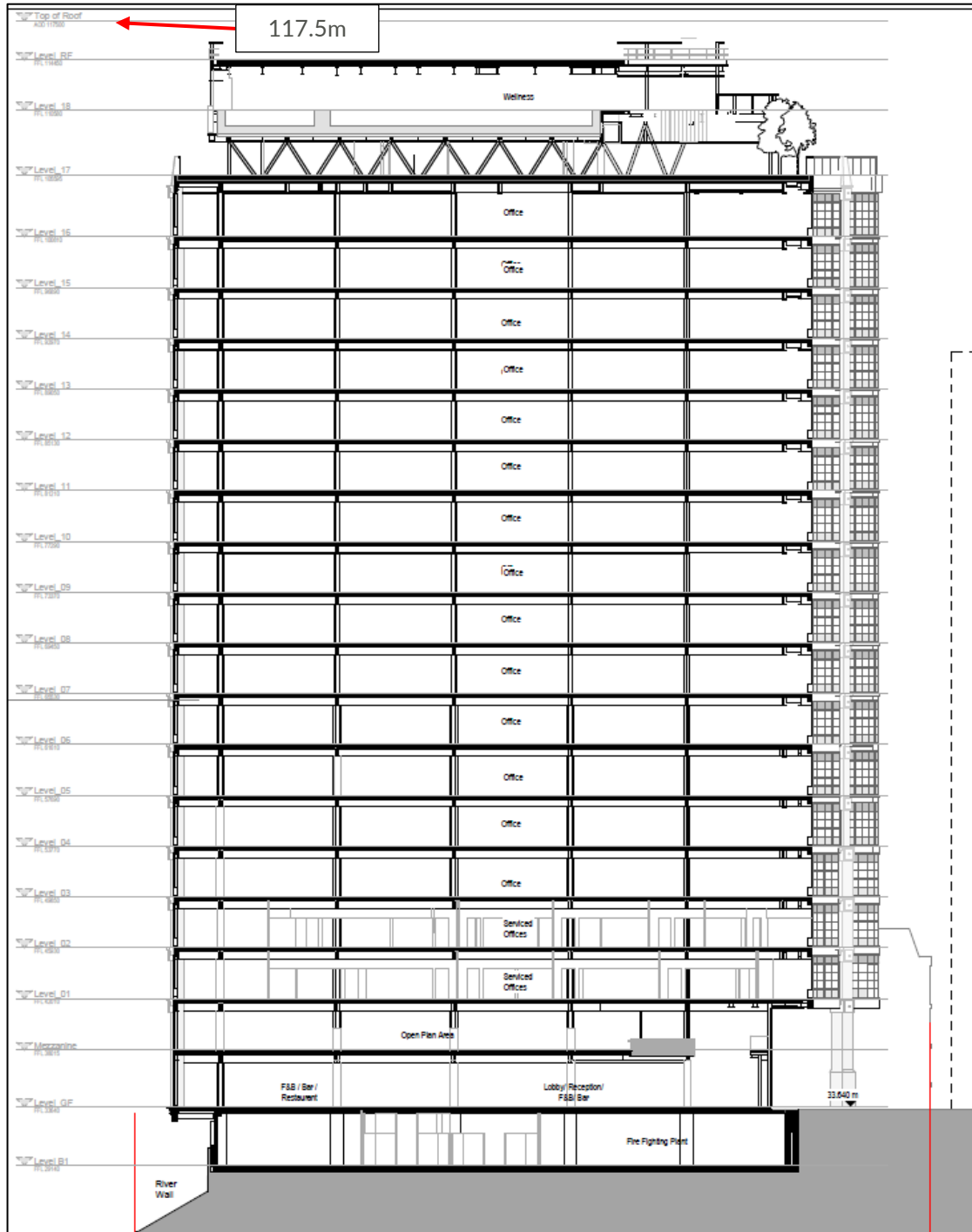


Figure 2 West elevation

² ALBH-EPR-ZZ-XX-TP-A-01-0123.pdf (cropped).

An aerial view of a city street intersection. A red bounding box highlights a specific area on the left side of the image, near a building and a street corner. The image shows various urban features like buildings, roads, and green spaces.



2 MANCHESTER AIRPORT DETAILS

2.1 Overview

The following section presents general details regarding Manchester Airport, shown in Figure 4 below.

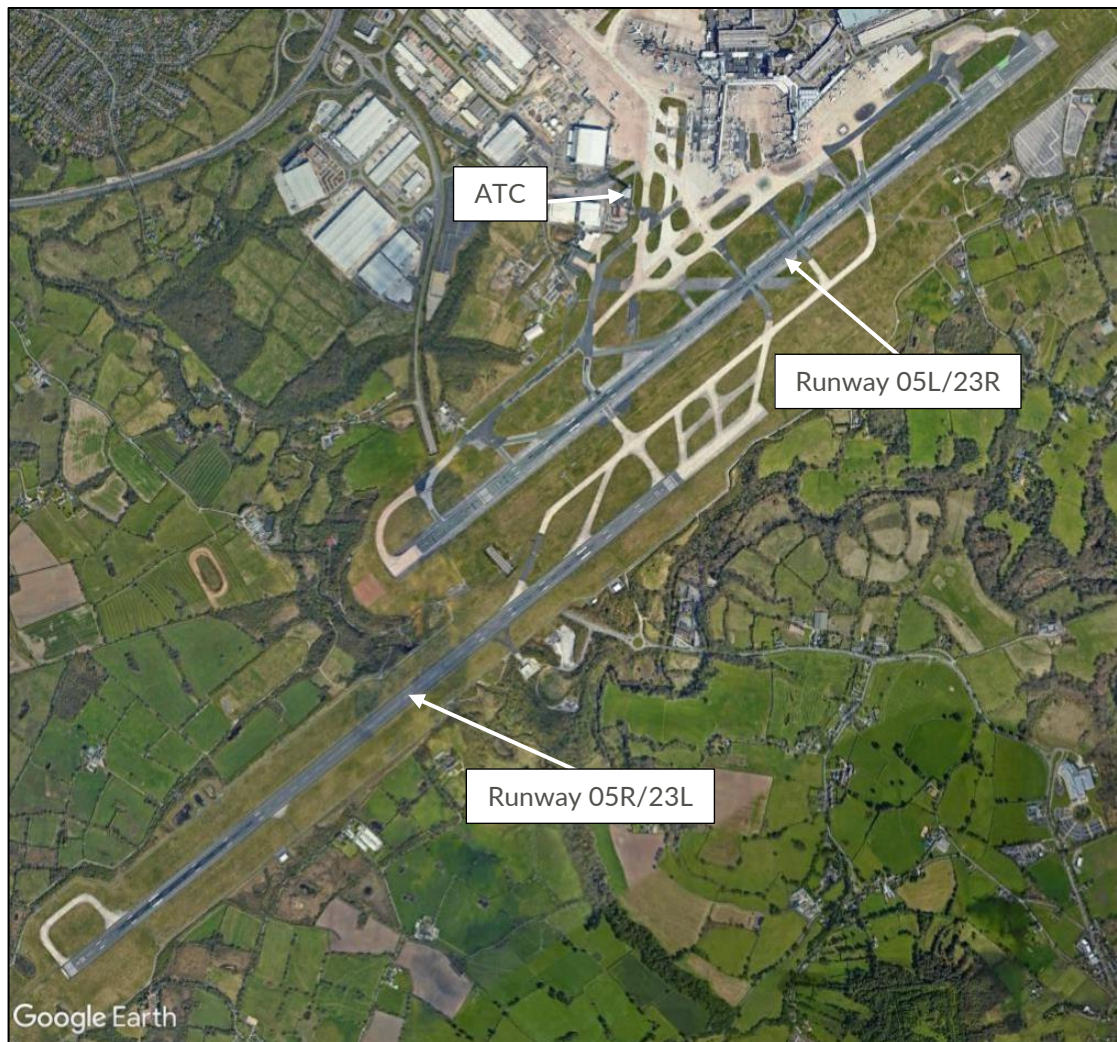


Figure 4 Manchester Airport – aerial image

2.2 Aerodrome Chart

The aerodrome chart for Manchester Airport is shown in Figure 5³ below.

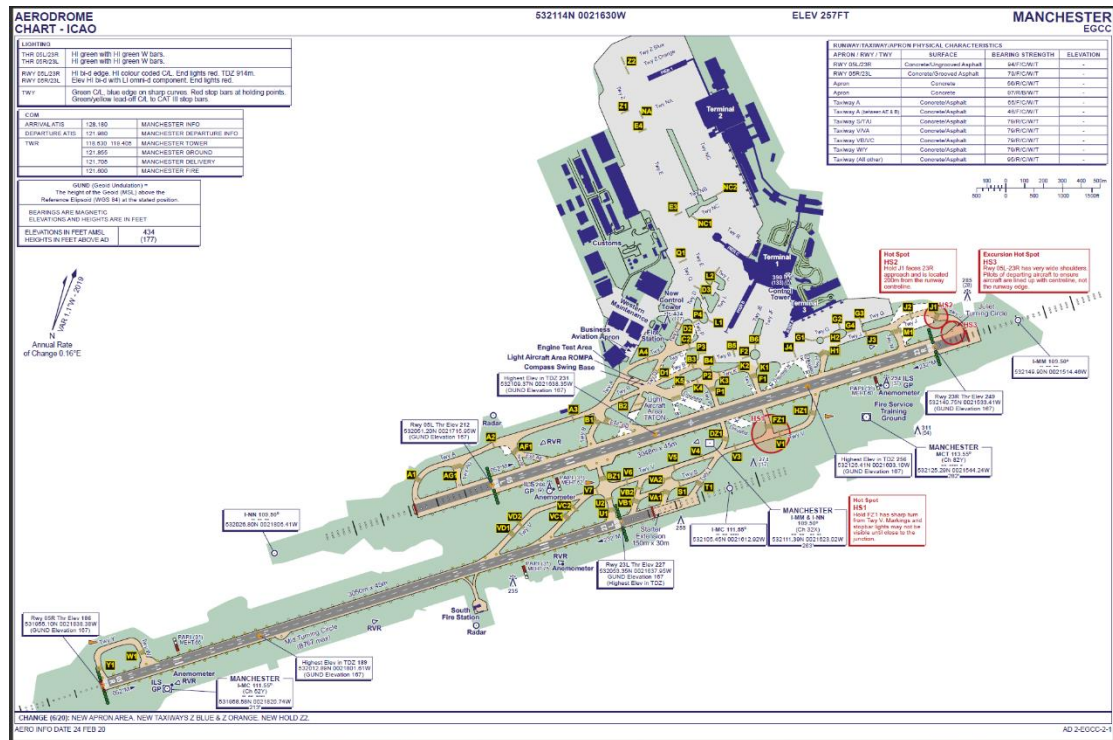


Figure 5 Manchester Airport - Aerodrome Chart

³ Source: NATS AIP

3 OBSTACLE LIMITATION SURFACES ASSESSMENT

3.1 Overview

Obstacle Limitation Surfaces are imaginary planes defined in three dimensions for physical safeguarding purposes (i.e. ensuring that physical structures do not present a safety hazard at an airfield) and are defined around licensed airfields. The dimensions and geometry of the surfaces are constructed based on detailed rules defined in the UK Civil Aviation Authority's Civil Aviation Publication 168. The size of the surfaces is dependent on the number of runways, their dimensions and the procedures carried out at the airfield.

The Obstacle Limitation Surfaces (OLS) for Manchester Airport have been modelled with respect to the red line boundary coordinates at the maximum building altitude (116.763 metres). The aim is to identify whether the proposed development would infringe the OLS at Manchester Airport.

3.2 Results

The Obstacle Limitation Surfaces for Manchester Airport are presented in Figure 6 below. The proposed development building plot coordinates are shown by the red crosses near the top of the chart (due to the scale they may appear as a single icon).

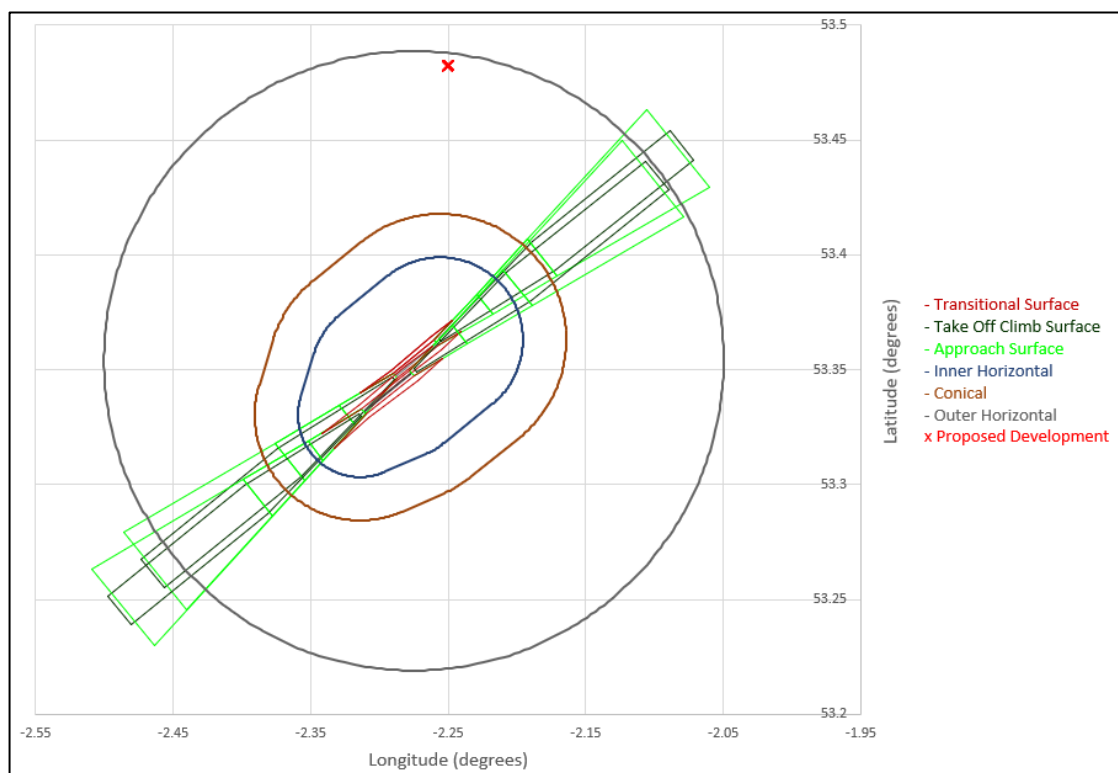


Figure 6 Manchester Airport Obstacle Limitation Surfaces chart

The proposed development lies beneath the Outer Horizontal Surface (OHS) for Manchester Airport. The proposed development is clear of the OHS by a minimum margin of 89.1928m. No physical safeguarding concerns are therefore predicted with respect to the OLS from the building structure.

Table 1 below presents a summary of the OLS assessment results.

Plot	Assessed height above mean sea level (amsl) (m) ⁴	Relevant Surface	Vertical Clearance ^{5,6} (m)
Red line boundary	117.5	Outer Horizontal Surface (OHS)	89.1928

Table 1 OLS detailed results

⁴ This is the maximum building height as per the building plans and was used to represent a worst-case assessment.

⁵ Vertical clearance between the top of the assessed building and the OHS.

⁶ These calculations have been based on an Outer Horizontal Surface of 206.6928m Above Ordnance Datum (AOD).

4 RADAR IMPACT ASSESSMENT

4.1 Overview

A radar impact assessment has been completed considering the nearest Secondary Surveillance Radar (SSR) to the proposed development.

4.2 Manchester Airport SSR

The location of the SSR at Manchester Airport relative to the development location (outlined in red) is shown in Figure 7 below.

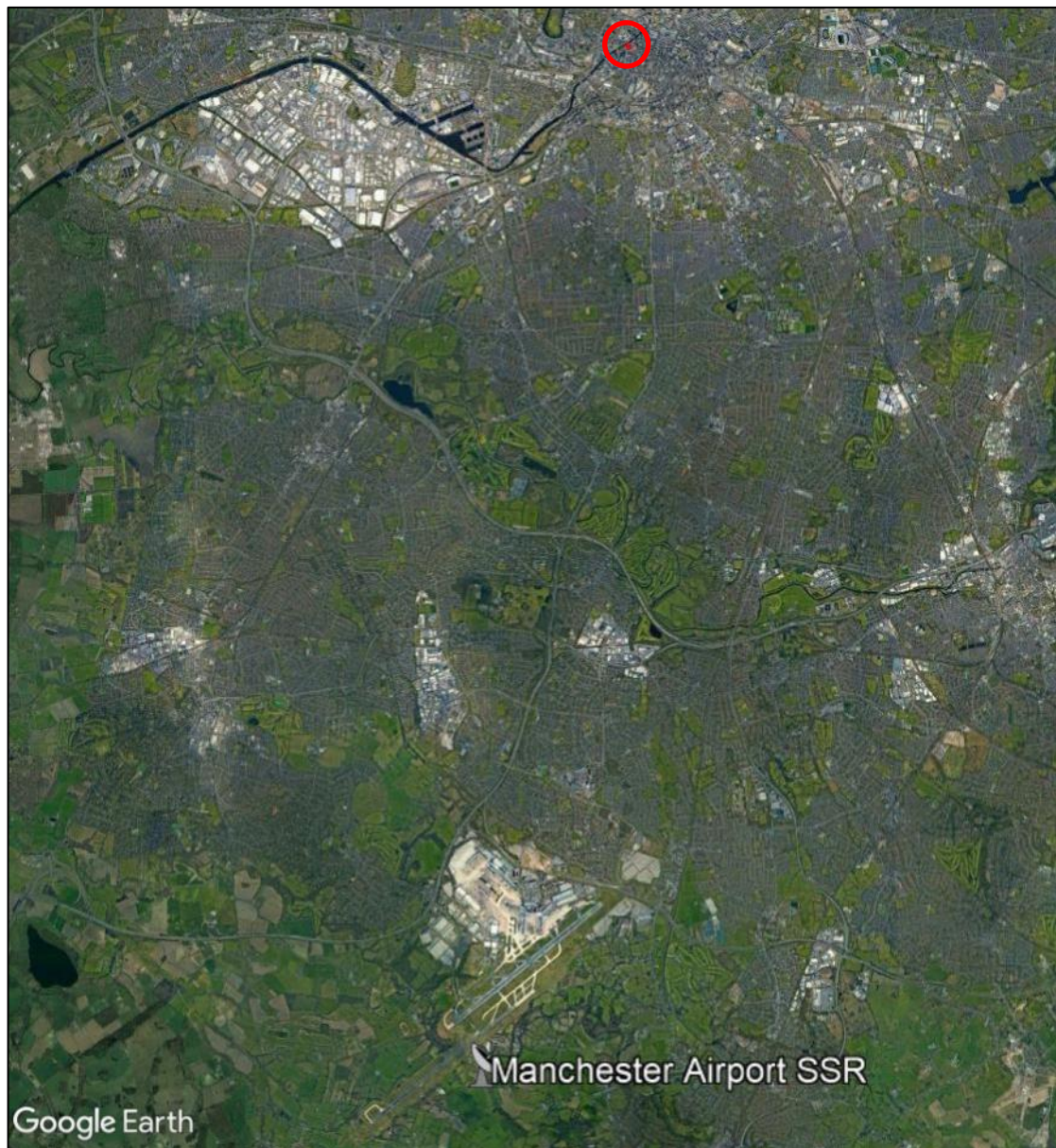


Figure 7 Location of the development relative to Manchester Airport SSR

A radar line of sight assessment was completed for the proposed building development.

The analysis predicts that the red line boundary at the maximum building height would be visible to the Manchester Airport SSR. Figure 8 on the following page shows the line-of-sight chart for a point on the red line boundary⁷ for reference.

Information regarding the methodology or the additional line of sight charts can be provided upon request. The box labelled 'certainty' in the figure provides the distance (in metres) by which the building is within line of sight/not within line of sight to the assessed radar (rounded to one decimal place).

⁷ The most visible point on the red line boundary based on the maximum building height and bare earth terrain. This is coordinate point 2.

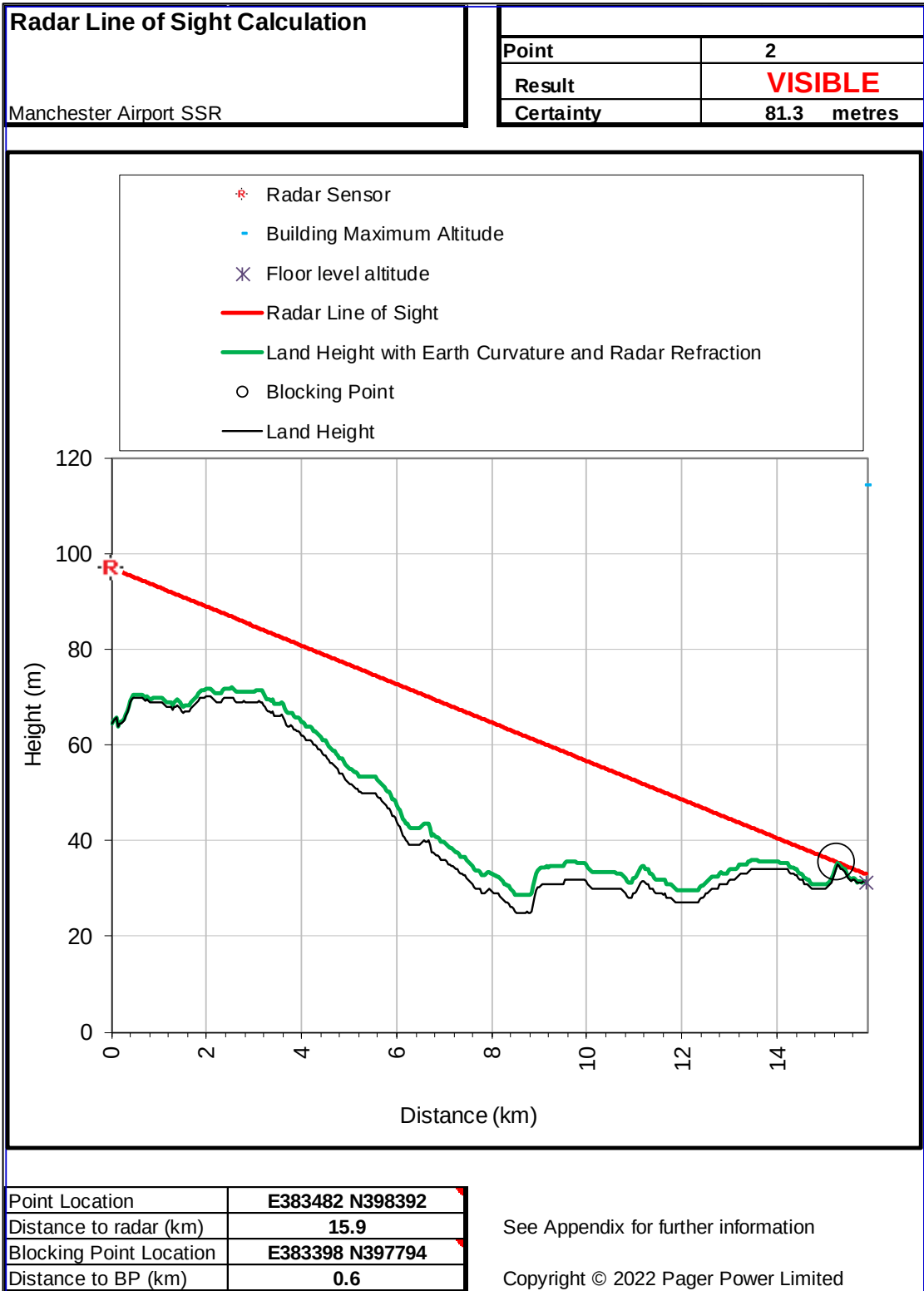


Figure 8 Radar line of sight chart for Manchester Airport SSR – Point 2

4.3 Additional Screening Analysis

The line-of-sights have been analysed in conjunction with 3D visualisations of existing intervening buildings. It is expected that most of the proposed development will be screened from the SSR by intervening tall buildings, particularly the parts of the proposed development that are lower above ground level.

Some limited visibility may be possible to the SSR at Birmingham Airport, however even so, radar concerns for buildings at this range may not be raised in practice, particularly in such a built-up area with many other existing buildings. Taller buildings within the city centre already produce shadowing effects on the same bearing from the radar.

Figure 9 below and Figure 10 on the following page show 3D visualisations, simulating the view towards the proposed development in a worst-case scenario⁸.



Figure 9 Intervening tall buildings blocking SSR line of sights towards proposed development

⁸ The proposed development was visualised using the red line boundary elevated to 81m above ground.

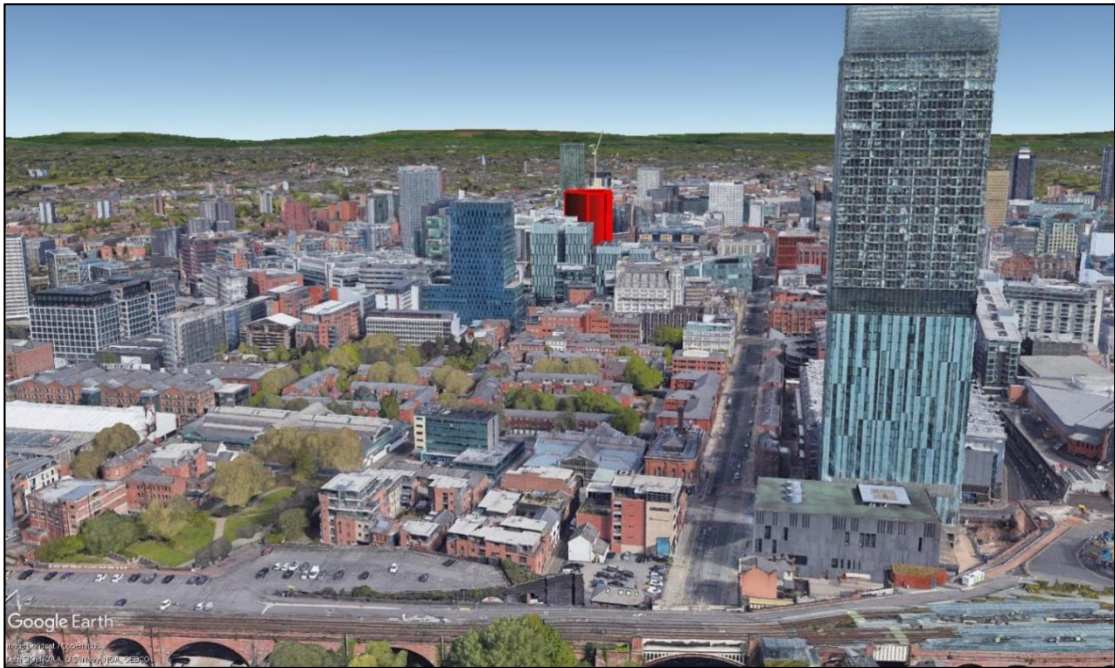


Figure 10 Intervening tall buildings blocking SSR line of sights towards proposed development

5 HIGH-LEVEL OVERVIEW OF CRANE USAGE AND AVIATION LIGHTING

5.1 Crane Usage

During the construction phase, cranes will be present at the site that will reach elevations greater than the final building height. In principle, safeguarding concerns for cranes are the same as for building developments.

Based on the maximum height of the proposed building development, cranes are very unlikely to breach the OHS. No physical safeguarding concerns are therefore predicted with respect to the OLS from the cranes. Proposed heights and positions of the cranes should be identified as soon as possible.

5.2 Aviation Lighting

The CAA has clear aviation lighting requirements for any obstacles that are 150m or more above ground level. The exact wording is:

“En-route obstacles (including cranes) of a height of 150m or more AGL must be fitted with lighting in accordance with the Air Navigation Order. Medium intensity (generically 2000 candela) steady red lights must be displayed at night and be visible from all directions (omnidirectional).”

We recommend that lights are also displayed during daylight periods.

Lighting aids should be supplied with secondary power unless agreed otherwise with the CAA”

The highest point of the proposed development is approximately 80m above ground level. This does not meet the height at which lighting is a requirement. Any cranes used on site are therefore very unlikely to meet the height at which lighting is a requirement. This should be confirmed once the heights and positions of the cranes are determined.

6 CONCLUSIONS AND NEXT STEPS

6.1 Conclusions

6.1.1 Manchester Airport Obstacle Limitation Surfaces (OLS)

The proposed development lies beneath the Outer Horizontal Surface (OHS) for Manchester Airport. The proposed development is clear of the OHS by a minimum margin of 89.1928m. No physical safeguarding concerns are therefore predicted with respect to the OLS from the building structure.

6.1.2 Manchester Airport Secondary Surveillance Radar (SSR)

It is expected that many of the line-of-sight paths from the Manchester Airport SSR towards the proposed development will be blocked by intervening buildings and terrain, particularly for the parts of the proposed development that sit low above ground level. Although some parts of the proposed development may be within radar line of sight, significant impacts on radar performance for buildings at this range are unlikely, particularly in such a built-up area with many other existing buildings. Taller buildings within the city centre are already expected to produce shadowing effects on the same bearing from the radar.

NATS responded to Pager Power's consultation request with confirmation that interference issues are not envisaged with the proposed development, based on the current plans.

6.1.3 Crane Usage and Aviation Lighting

Based on the maximum height of the proposed building development, cranes will not breach the OHS as long as they extend no more than 89 metres above the finished height of the building – including when parked. No physical safeguarding concerns are therefore predicted with respect to the OLS from the cranes. Proposed heights and positions of the cranes should be identified as soon as possible.

The Civil Aviation Authority (CAA) has clear aviation lighting requirements for any obstacles that are 150m or more above ground level. The highest point of the proposed development is approximately 80m above ground level. This does not meet the height at which lighting is a requirement. Any cranes used on site are therefore very unlikely to meet the height at which lighting is a requirement. This should be confirmed once the heights and positions of the cranes are determined.

6.2 Next Steps

The findings of this report should be shared with Manchester Airport, this should form the basis of further engagement with the airport's safeguarding team.

APPENDIX A – DEVELOPMENT DETAILS

Assessed Red Line Boundary Coordinate Data

ID	Easting	Northing	Maximum Height (m amsl)
1	383462	398434	117.5
2	383482	398392	117.5
3	383496	398385	117.5
4	383505	398417	117.5
5	383506	398419	117.5
6	383508	398422	117.5
7	383509	398423	117.5
8	383510	398425	117.5
9	383512	398426	117.5
10	383507	398437	117.5
11	383500	398451	117.5

Assessed Red Line Boundary Coordinate Data



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