



Obstacle Limitation Surfaces Assessment

Atlas Business Park

Date: 26th September 2022

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Executive Summary

Osprey Consulting Services Limited was commissioned to undertake an Obstacle Limitation Surfaces (OLS) assessment at Manchester Airport, in relation to the Atlas Business Park proposed development for five buildings.

Impact on the OLS

The lowest OLS at the location of the site and therefore the most restrictive is the Runway 05L TOCS with an elevation of 93.01m AMSL.

This is above the elevation of any of the proposed units, even when considering the red line boundary plus a 20m buffer and applying the maximum building elevation of 91m AMSL.

There is no effect from the proposed development on the Manchester Airport OLS.

Recommendations

In the absence of site topographical surveys, it is recommended that the site ground elevation and the maximum building elevation AMSL is verified for accuracy.

The Instrument Flight Procedures (IFP's) that serve the aerodrome are not within the scope of this assessment; however, these will need to be considered as part of the planning application stage.

During the construction phase, crane and other machinery used at the site would have to be considered against the protected surfaces as assessed within this report, as well as the IFP's that serve the aerodrome.

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1 Introduction

1.1 Background

Osprey Consulting Services Limited was commissioned to undertake an Obstacle Limitation Surfaces (OLS) at Manchester Airport, in relation to the Atlas Business Park proposed development for five buildings.

1.2 Scope of the Assessment

This report assesses the Business park in relation to the OLS and has been completed with the use of the Airport's 2021 CAP 1732 aerodrome survey data.

The Instrument Flight Procedures (IFP's) that serve the aerodrome are not within the scope of this assessment; however, these will need to be considered as part of the planning application stage.

1.3 Data Provided by Client

- 20071-PL210 Unit 1 Proposed Plans.
- 20071-PL215 Unit 1 Proposed Elevations.
- 20071-PL220 Units 2 & 3 Proposed Plans.
- 20071-PL225 Units 2 & 3 Proposed Elevations.
- 20071-PL240 Unit 4 Proposed Plans.
- 20071-PL245 Unit 4 Proposed Elevations.
- 20071-PL255 Unit 5 Proposed Plans & Elevations.
- Atlas Business Park, Brief Specification - Issue 2 220810.
- Peter Lam 16.08.22.
- PL 201C Proposed Site Plan.

1.4 Build Heights and Site Datum

OS Terrain 50 data suggests that the maximum ground elevation within the red line boundary is 71m.

The document 'Atlas Business Park, Brief Specification - Issue 2 220810' states the following.

- Unit 1 (84,100 ft²), clear height to underside of haunch: 16m.
- Unit 2 (37,300 ft²), clear height to underside of haunch: 12.5m.
- Unit 3 (49,500 ft²), clear height to underside of haunch: 12.5m.
- Unit 4 (74,200 ft²), clear height to underside of haunch: 12.5m.
- Unit 5 (166,200 ft²), clear height to underside of haunch: 16m.

As there is no information on the external height, i.e. the apex or the highest physical point of the developments, Osprey has applied the following parameters.

- A maximum building height of 20m Above Ground Level (AGL) is used.
- A site datum of 71m Above Mean Sea Level (AMSL) is used.

Resultantly;

- A maximum building elevation of **91m AMSL** is used.

In the absence of site topographical surveys, it is recommended that the site ground elevation and the maximum building elevation AMSL is verified for accuracy.



Figure 1 – PL 201C Proposed Site Plan

1.5 Orientation

The provided 'PL 201C Proposed Site Plan' was scaled into the AutoCAD drawing. A 20m buffer was used for the red line boundary of the site, as depicted in Figure 2, and this was considered as a possible obstruction with an elevation of 91m AMSL to assess against the OLS.



Figure 2 – PL 201C Proposed Site Plan (AutoCAD scaling)

The site is approximately 2.5 km from the Aerodrome Reference Point (ARP), see Figure 3.

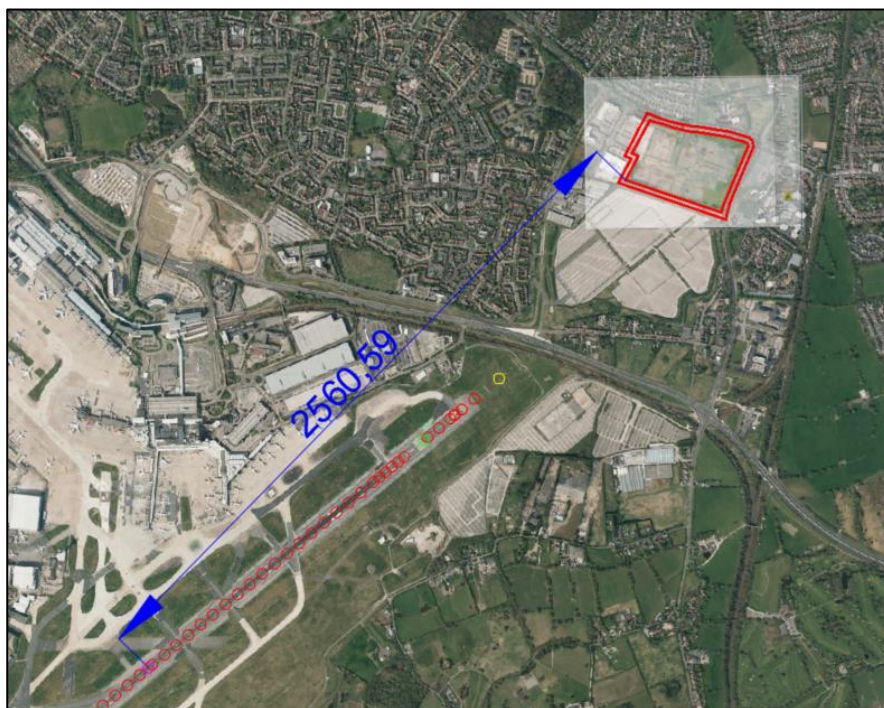


Figure 3 – Site in relation to Manchester Airport ARP

2 OLS Analysis

2.1 Overview

2.1.1 What are OLS?

OLS are safeguarded areas around aerodromes that limit the development of obstacles in defined areas of airspace to an acceptable height. As the surfaces are heavily regulated, obstacle density can be controlled to a satisfactory level to promote the safe day-to-day operations at an aerodrome.

All new proposed developments in the immediate vicinity of the aerodrome must be analysed and consulted on to establish any potential detrimental effects to safety. Figure 4 below shows an example OLS and the individual surfaces it comprises.

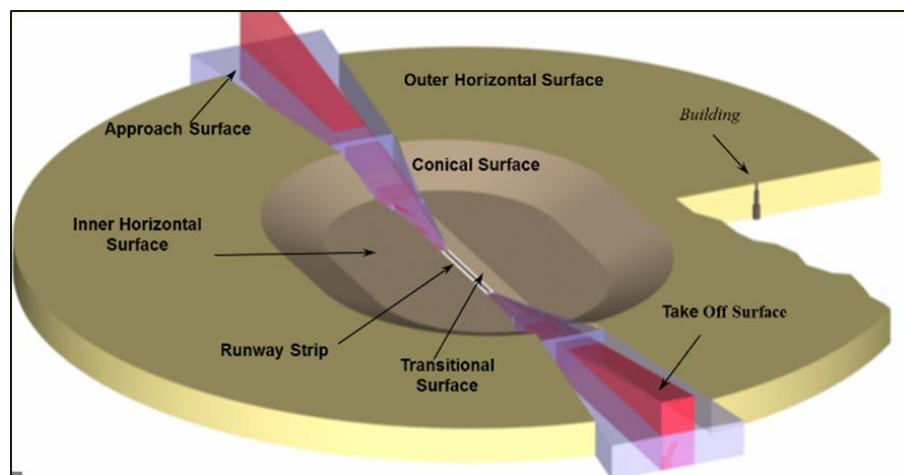


Figure 4 - Example OLS

2.2 Airport Classification

Manchester Airport has 4 Runways more than 1800m in length and are assessed as being Code 4 in accordance with CAP 168.

2.3 Surfaces Potentially Affected by the development

2.3.1 Inner Horizontal Surface

The Inner Horizontal Surface (IHS) is a flat plane with a shape defined by circles of 4000m radius prescribed about the strip ends of the runway and joined by common tangent points.

Where an end of a subsidiary runway more than 1800 m long is less than 3000m from any point on the periphery of the IHS constructed, the dimensions of the surface are modified. A circle of radius 3000 m is described centred on the strip end of the subsidiary runway, and this is joined by common tangents to the pattern already established.

The surface is 45m above the elevation of the lowest threshold for the aerodrome; for Manchester Airport, this is RWY 05R, 56.77m.

The IHS therefore has an elevation of 101.77m AMSL.

Where the IHS is at any point lower than an approach surface or take-off climb surface, the IHS is the obstacle limitation surface at that point.

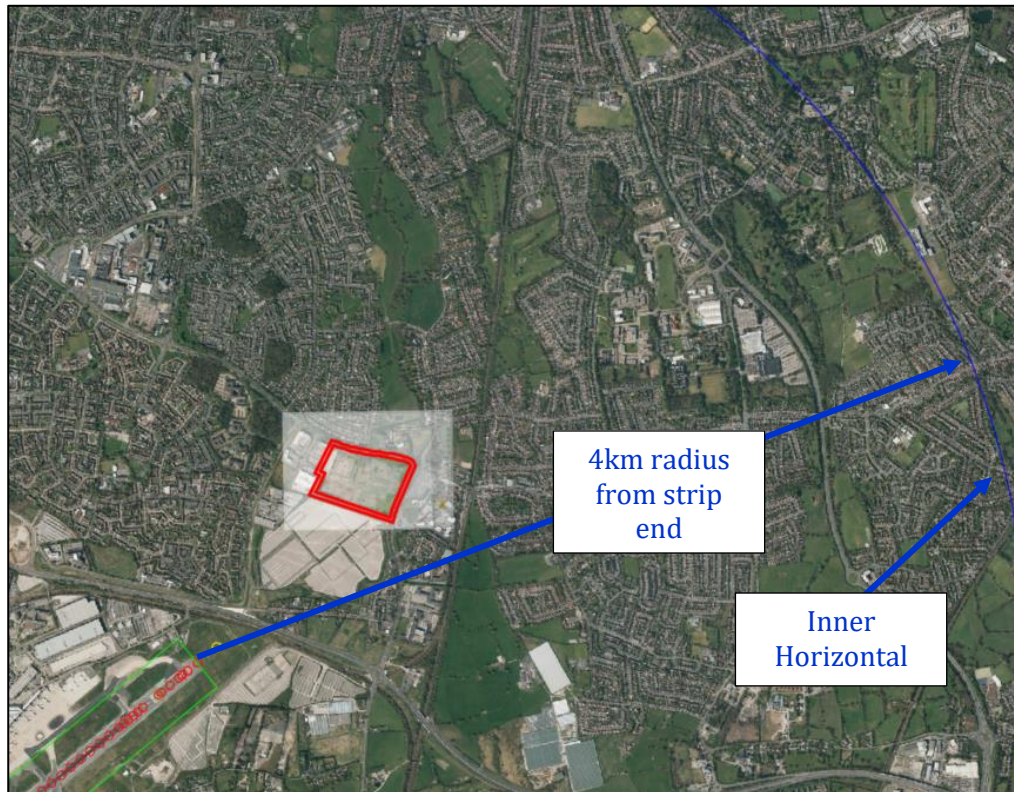


Figure 5 – IHS and Site

2.3.2 Approach Surface

An approach surface is established for each runway direction intended for use by landing aircraft. The surface starts 60m before the landing threshold at threshold elevation with an inner edge length of 300m and diverges 15% from the runway centreline. The surface is stepped in its profile with multiple gradients, the first section is an inclined slope of 2% which extends for 3000m, the second section is a 2.5% inclined slope and extends for 3600m and the final section is a horizontal plane which extends for 8400m.

Runway 23R

The elevation of the Runway 23R approach surface at the most restrictive point of the site is 98.25m AMSL.



Figure 6 – Runway 23R Approach Surface and Site

Runway 23L

The elevation of the Runway 23L approach surface at the most restrictive point of the site is 129.41m AMSL.



Figure 7 – Runway 23L Approach Surface and Site

2.3.3 Transitional Surface

The Transitional Surface is a complex surface sloping at 14.3% (1:7) up to the Inner Horizontal Surface from the side of the runway strip and from part of the side of the Approach Surface.

The Transitional Surface is equal to the elevation of the Approach Surface at any point along the lower edge and extends upwards to connect with the IHS at 101.77m.

Runway 23R

The elevation of the Runway 23R Transitional at the most restrictive point of the site is 100.06m AMSL.

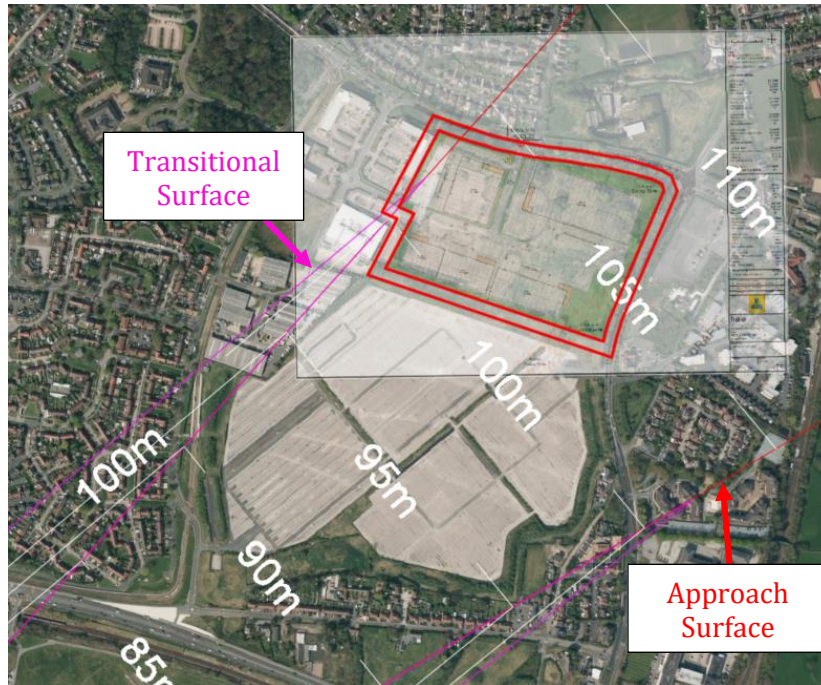


Figure 8 – Runway 23R Transitional & Approach Surface and Site

Runway 23L

The site is located outside of the Runway 23L Transitional Surface.

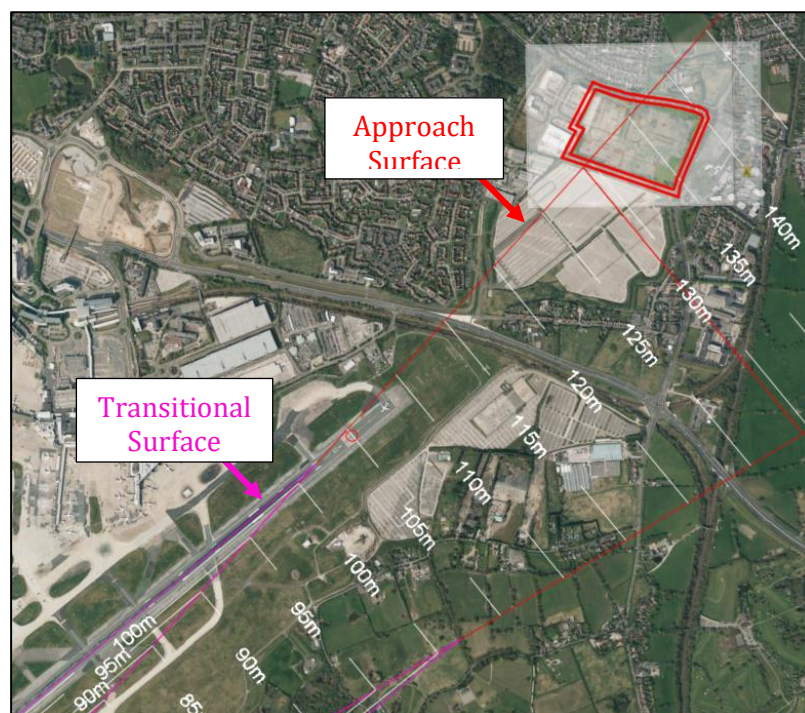


Figure 9 – Runway 23L Transitional & Approach Surface and Site

2.3.4 Take-off Climb Surface (TOCS)

The TOCS is an inclined plane located beyond the end of the Runway or the end of the clearway where one is provided.

The TOCS surface starts at the Departure end of Runway (DER), at DER elevation rising with a gradient of 2%. The surface has an inner edge of 180m length, sides that diverge from the runway centreline at 12.5% and extends to 15,000m at a final width of 1200m.

Runway 05L

The elevation of the Runway 05L TOCS at the most restrictive point of the site is 93.01m AMSL.



Figure 10 – Runway 05L TOCS and Site

Runway 05R

The elevation of the Runway 05R TOCS at the most restrictive point of the site is 126.8m AMSL.



Figure 11 – Runway 05R TOCS and Site

2.4 Obstacle Free Zone (OFZ)

2.4.1 What is the OFZ?

UK CAP 738 'Safeguarding of Aerodromes' defines the OFZ as;

An OFZ is intended to protect aeroplanes from fixed and mobile obstacles during Category II and III operations when approaches are continued below decision height, and during any subsequent missed approach or bailed landing with all engines operating normally. It is not intended to supplant the requirement of other surfaces or areas where these are more demanding.

It is designed to protect an aeroplane with a wingspan of up to 60m which has descended below a height of 100 ft and has been correctly aligned with the runway at that height by visual reference to the runway or approach lighting. The length of runway enclosed is based on an assumption that a go-around is initiated not later than the end of the touchdown zone and that a further 900m distance is sufficient for the pilot to make any necessary changes of the aircraft configuration and to achieve a positive rate of climb of at least 3.33% with a deviation from track contained within a 10% splay either side of centreline. When an aeroplane's wingspan is greater than 60 m or its performance is worse than the basis used in defining the surfaces, the OFZ will need to be redesigned or operations for the particular aeroplane restricted. Conversely a narrower OFZ may be acceptable if the wingspan of the aeroplanes at a particular aerodrome is limited to less than 60m.

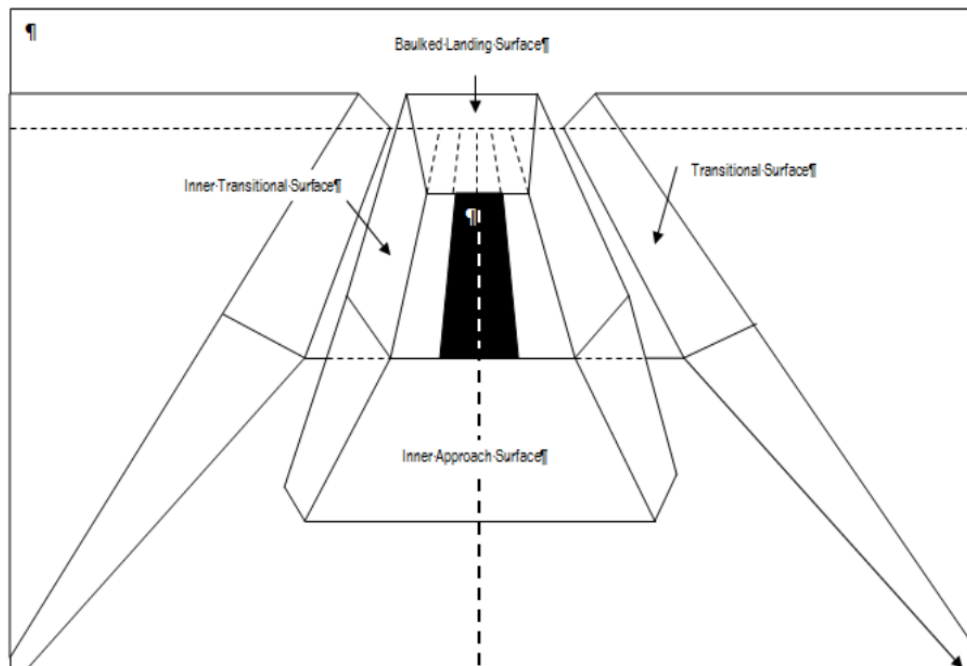


Figure 12 – OFZ Cross Section

2.4.2 OFZ Assessment

The OFZ for runways 23R, 05L and 05R has been considered against the proposed development and in any case, the OLS as assessed in Section 2.3 are more restrictive and therefore the controlling factor. Runway 23L does not have either a CAT I/II/III approach and therefore neither an associated OFZ.



Figure 13 – Runway 23R OFZ and Site



Figure 14 – Runway 05L OFZ and Site



Figure 15 – Runway 05R OFZ and Site

2.5 Summary

The lowest OLS at the location of the site and therefore the most restrictive is the Runway 05L TOCS with an elevation of 93.01m AMSL.

This is above the elevation of any of the proposed units, even when considering the red line boundary plus a 20m buffer and applying the maximum building elevation of 91m AMSL.

There is no effect from the proposed development on the Manchester Airport OLS.