Aviaire
WILDLIFE HAZARD MANAGEMENT CONSULTANTS
Improving safety from the ground up

Phase 2

Wythenshawe, Manchester



Aviation Wildlife Hazard Design Risk Assessment

To support a planning submission for the inclusion of photovoltaic roof panels on blocks of flats at Foscarn Drive, Bracken Drive, Glazebury Drive, Wendon Road

Prepared for: Wythenshawe Community Housing Group Limited

Date Produced: November 2025

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Wythenshawe
Community Housing Group

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Authority for this Document

All enquiries relating to this document are to be addressed to Aviaire Ltd.

Document Status

Status: Final

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Revision Control

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Revision History

Revision History				
Version No	**Rev No**	**Date**	**Summary of Changes**	**Section or Page Number**

Abbreviations

ARP	Aerodrome Reference Point
CAA	UK Civil Aviation Authority
DRA	Design Risk Assessment
ICAO	International Civil Aviation Organization
LPA	Local Planning Authorities
MAN	Manchester Airport
OLS	Obstacle Limitation Surface
SME	Subject Matter Experts
WHM	Wildlife Hazard Management
WHMP	Wildlife Hazard Management Plan
WSAC	Wildlife Species of Aviation Concern
WCHG	Wythenshawe Community Housing Group

1 Executive Summary

Overview

In November 2025, Aviaire Limited was asked by Wythenshawe Community Housing Group Limited (**WCHG**) to undertake an Aviation Wildlife Hazard Design Risk Assessment of supplied plans and documents and to develop an associated Wildlife Hazard Management Plan for blocks of flats at:

- 1-24 Foscarn Drive, Manchester, M23 1LU
- 1-24 Bracken Drive, Manchester, M23 1LT
- 1-30 Glazebury Drive, Manchester, M23 1LS
- 2-72 Wendon Road, Manchester, M23 1PU

This document is to support the planning conditions discharge of condition 4, for a robust Wildlife Hazard Management Plan (**WHMP**) regarding PV Panels and bird nesting within the project.

Design Risk Assessment and Suitability Statement

Aviaire has assessed the Project design proposal, and as long as the recommendations within this DRA are adhered to, it is Aviaire's opinion that the supplied project plans and documents adequately "guard against new or increased wildlife hazards" [1] for Manchester Airport (**MAN**) within the project.

This supports the objectives for the project and compliance with all applicable statutory obligations and standards and recommended practices.

This will also satisfy aviation wildlife hazard management expectations from the Local Planning Authority and MAN.

[1] Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002

2 Introduction

In November 2025, Aviaire Limited was asked by WCHG to undertake an Aviation Wildlife Hazard Design Risk Assessment (**DRA**) of supplied plans and documents and to develop an associated Wildlife Hazard Management Plan (**WHMP**).

Aviaire Limited (www.aviaire.co.uk) is a wildlife hazard management consultancy with subject matters experts in safeguarding aerodromes and aircraft against the risk of wildlife hazards.

2.1 Aim

The aim of this DRA is to support:

1. Good practice in aviation wildlife hazard management on the Project site under project obligations to safeguard aircraft using the subject aerodrome.
2. Project requirements occur under the Construction (Design and Management) Regulations 2015.
3. Planning obligations that support requirements in the "Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2002", where there is a requirement for the project to mitigate against:
    i. An elevation in onsite populations for the wildlife species of aviation concern; and
    ii. A contribution towards an elevation in aviation safety risks for aircraft using the subject aerodromes and surrounding critical airspace.

The planning obligations will be in perpetuity or until subject aerodromes are no longer operational.

For this project, the "subject aerodrome" is Manchester Airport (MAN).

2.2 Goals

The ultimate goal of a DRA is to support protection of aircraft passengers, flight crews, aircraft, the operational capability of aerodromes, all persons on aerodrome sites, their surrounding local communities and environment.

The goal of this DRA is to show that full and appropriate consideration has been given by subject matter experts (Aviaire Limited) to ensure supplied documents for the Project adequately "guard against new or increased wildlife hazards" [2] for MAN following statutory and regulatory guidelines, and industry good practice in wildlife hazard management

2.3 Key Objective

The key objective of this document is to highlight where in supplied project documentation there are no proposed activity, elements, processes and/or materials that will or may create catalysts for likely elevations in aviation safety risk ratings for MAN.

[2] Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002

3 Methodology

3.1 Assessment Criteria

Aviaire's DRA employs a Red/Amber/Green (RAG) strike risk rating in its detailed assessment stage, similar to that used by the International Civil Aviation Organization (ICAO) [3] and the UK Civil Aviation Authority (CAA) [4].

Below are the design risk rating descriptions used in this document – See Sections 8.1 and 8.2. They are based on Section 3.4.3 of ICAO Doc 9137 and common practice in ecological assessments:

Assessment	Design Risk Rating Description
RED	**"HIGH"** Proposal **has likely catalyst(s)** for elevation in aviation safety risk ratings if implemented as indicated in provided plans and/or documents. The proposal should be reviewed for agreement on implementation of design variations and/or robust management action(s) to decrease the assessed risk to at least an "medium" state. The relevant plans and/or documents should be reviewed by the project design team in context to commercial objectives for the project and applicable statutory obligations and applicable standard and recommended practices. All agreed management actions to be incorporated in the Wildlife Hazard Management Plan for the project.
AMBER	**"MEDIUM"** Proposal **has catalyst(s) that may contribute** to an elevation in aviation safety risk ratings that can be tolerated if implemented as indicated in provided plans and/or documents. All "medium" catalysts **require management actions** throughout enabling and construction phases of the project, and for the in-use life of the project or until relevant aerodrome is no longer operational (whichever is shorter) **AND** immediate **implementation of design variations and/or additional management action(s)** if assessed at some time in the future as starting to actively contribute to an increased aviation safety risk i.e. site features and/or activities have become "high" catalysts. All agreed management actions will be incorporated in the Wildlife Hazard Management Plan for the project.
GREEN	**"NEGLIGIBLE"** Proposal has **no likely catalyst(s)** for elevation in aviation safety risk rating. There will be No required actions.

[3] ICAO, Document 9137, Airport Service Manual, "Part 3 - Wildlife Control & Reduction", 2020 (5th Edition)

[4] UK CAA, CAP 772 - Wildlife Hazard Management at Aerodromes, 2017 (Issue2)

3.2 Assessment Process

There are two steps in a DRA:

1. The ecological assessment
2. The design risk assessment

Ecological Assessment

Consideration is given in the first instance to all wildlife species within each wildlife group currently occurring or likely to occur on the Project site.

There are four groups of wildlife that must considered:

- Birds
- Mammals
- Insects
- Reptiles

Some species in each group can give rise to a strike risk for aircraft, depending on mass, abundance level and occurrence of the species above the defined Obstacle Limitation Surface (OLS) for an airport [5]

An initial list of locally occurring wildlife species is short listed to the species arriving or departing from the site via an incursion through the defined OLS anywhere across the 13km safeguarded zone.

Consideration is given to the Project site and local factors that influence occurrence, abundance levels and likely breeding rates of wildlife species on the Project site:

- Project site scale and layout
- Project site proximity to the subject aerodrome and it's OLS
- Local topography
- Local hydrology
- Local land use

The list of wildlife species then finalised to those whose incursion rate will likely increase as direct result of changes of the Project site – a fact to be avoided as this will cause an unwanted escalation in aviation safety risk for aircraft using airspace above the OLS for MAN.

Design Risk Assessment

When undertaking a DRA, it is necessary to consider the shortlisted species responses to five possible aspects in a design most likely or may contribute to an escalation in aviation safety risk for aircraft using the subject aerodrome:

1. Building and structures
2. Hard landscaping
3. Soft landscaping
4. Water and drainage
5. Social behaviour and management

[5] In ICAO Annex 14: Obstacle Limitation Surfaces (OLS) "define the airspace around aerodromes to be maintained free from obstacles so as to permit the intended aircraft operations at the aerodromes to be conducted safely and to prevent the aerodromes from becoming unusable by the growth of obstacles around the aerodromes." For the purposes of good practice in aviation wildlife hazard management the OLS also defines the airspace to be kept as clear as reasonably possible from wildlife.

Changes to the existing environment will directly influence the occurrence, behaviour and abundance levels of wildlife. All the changes onsite must be viewed in context with the surrounding area to be able to assess the overall impact on bird activity onsite and within the 13km area.

3.3 Engagement With Subject Airport

To ensure the DRA is robust and meets with the subject airport's approval there is requirement for liaison with a subject airport at the start and end of the DRA process.

There should be initial engagement to mutually agree the wildlife species of aviation concern.

To inform the ecological assessment, alongside requests to other key sources for relevant data, the airport is asked to share any relevant data it may hold to inform the ecological assessment e.g. known flight paths and hotspot locations of occurrence for the agreed wildlife species of aviation concern.

4 Environmental Assessment

4.1 Project Site

4.1.1 Location

The Project is located on land immediately North of Manchester Airport by approximately 4.49 kilometres from the aerodrome reference point (**ARP**).

What3words: leans.cargo.fish [circa centre of site]

See Figure 1 for map of the Project site location.

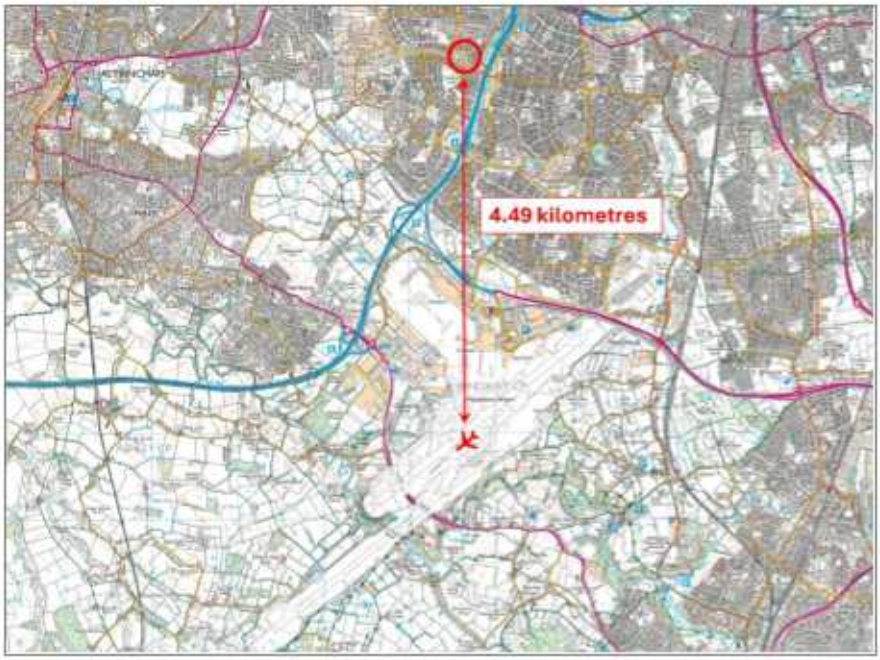


Figure 1: Site Location

4.1.2 Scale and layout

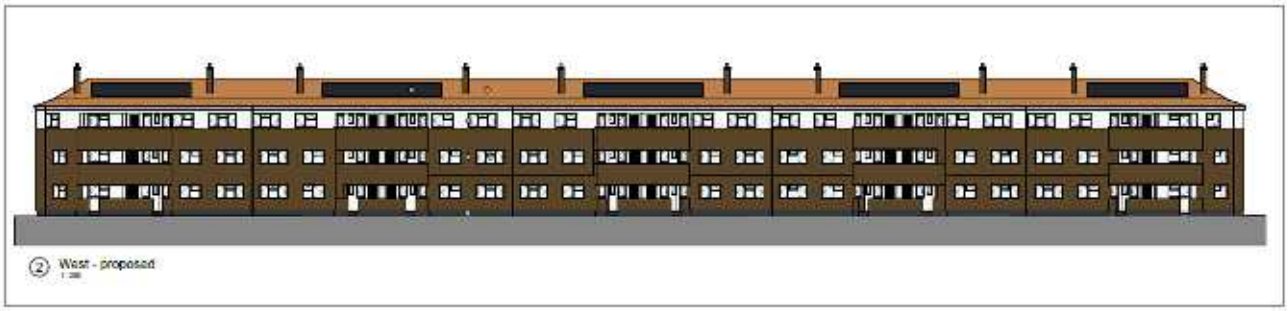


Figure 2: Architects drawing detailing example PV panels

4.1.3 Proximity to Manchester Airport and its OLS

With the Project site being located to the North of MAN, by approximately 4.49 kilometres from the ARP, it does not fall under the critical airspace of any of the approach or climb out paths.

4.2 Local Topography

The local topography will impact on how bird species will behave across the site

- Onsite observations
  - The area is predominantly residential, featuring private gardens and grassed spaces.
  - Fairly flat with minimal undulation
- Offsite observations
  - Relative topography surrounding the Project site is fairly level with no large increases in ground height
  - The landscape is mainly commercial and housing

4.3 Local Hydrology

Understanding hydrological movements across the Project site and its surrounding areas allows SME to understand which bird species are likely to be attracted to the site for the purposes of bathing or drinking.

Consideration is also given to the frequency and duration of flooding across the Project site and its surrounding areas to understand exceptional bird movements and therefore, consequentially, possibly escalating incursions though the OLS somewhere across the 13km safeguarded zone.



Figure 3: Flood risk map for the area for area the Project site [6]

- On**site** observations
  - The site itself is unlikely to flood
- Offsite observations
  - The immediate surrounding land of the site shows small pockets where medium risk of flooding may occur, but these are small pockets and not extensive.

[6] www.flood-map-for-planning.service.gov.uk

4.4 Local Land Use

The local ecology plays a significant part in influencing bird numbers and movements on the site and to/from surrounding areas. The influence level will vary with the favourability of the site for activities such as feeding, nesting and roosting.

- Offsite observations
  - Immediately to the west of the project site is Roundthorn Business Park. This extensive park houses various factory and industrial buildings with flat or low-pitched roofs that are highly attractive to Gulls, Starlings and Pigeons
  - Chorlton Water Park is situated north of the site. Although it may attract waterfowl and some gulls, the ponds are relatively small, so it is unlikely to present a significant issue for the project
  - Lindow Common, the sole notable SSSI, lies south of both the development and the airport. It is not expected to contribute wildlife to the project area
  - Each existing land use has differing attractions for birds which influences their behaviour and movements across the entire local area
  - The residential areas will attract certain species of bird such as Woodpigeon, Feral pigeon and members of the corvid family such as Carrion crow and Jackdaw
  - Large local open spaces used for public recreation are known to attract bird species such as Gulls and Corvids such as Rook
  - Commercial local land will be an attractant to a variety of bird species, although this is dependent on the land usage although Feral pigeons have been known to frequent buildings to the South

5 Ecological Assessment

5.1 Initial Appraisal

All wildlife occurring within a subject area are initially considered in the ecological assessment as there is a possibility all do or could present an aviation safety risk to different stages of aircraft operations.

All four groups of wildlife are also considered: Insects, reptiles, mammals and birds.

5.1.1 Insects, reptiles and mammals

In the initial stages of this ecological assessment, whilst bird, insect, reptile and mammal all do occur and will continue to occur on the Project site, insects, reptiles and the majority of mammals have been discounted from further assessment as none are or could directly cause an escalated air safety risk for aircraft using MAN.

- In the UK, insect species rarely present a direct safety risk because their overall body mass and occurrence levels are very low. This will not directly contribute to an escalated air safety risk for aircraft using MAN.

  NOTE: This said, insects will provide a food source for various birds that could present a direct escalated air safety risk for aircraft using MAN, and this needs to be minimised.
- Reptiles are land-based and those occurring on the Project site will not directly contribute to an escalated air safety risk for aircraft using MAN.
- Mammals such as badger, fox and deer are land-based and those occurring on the Project site will not directly contribute to an escalated air safety risk for aircraft using MAN.

  NOTE: Bats are mammal species retained within the assessment process because, though they have a low body mass, the Project site is in close proximity to the airfield and other areas of critical airspace, means current or future occurrence levels of bat may contribute to an escalated air safety risk for aircraft using MAN. This needs to be considered in the next stages of the ecological assessment

5.1.2 Birds

Because of their possible capability of flight into the same air space used by aircraft, all bird species occurring within 13km of MAN are considered in this initial ecological assessment.

Using guidance in ICAO 9137 and CAP 772, a long list of local bird species is first collated.

This was achieved using the following sources and established Aviaire's subject matter expertise (**SME**) in the Manchester area:

- Manchester Airport 13km Wildlife Hazard Survey
- Manchester - British Trust for Ornithology
- Manchester Airport, List of "Wildlife Species of Aviation Concern"
- Greater Manchester bird clubs up to date sightings

Subject matter expertise and local bird species data was also sourced from the Royal Society for the Protection of Birds (**RSPB**).

The following list is also the wildlife species of concern from November 2025 as those of highest risk for aircraft using MAN and its terminal airspace:

5.1.3 Intolerable Birds (November 2025)

Common Name	Latin Name
1. Barnacle Goose	*Branta leucopsis*
2. Bewick's Swan	*Cygnus columbianus bewickii*
3. Blackbird	*Turdus merula*
4. Black-Headed Gull	*Chroicocephalus ridibundus*
5. Canada Goose	*Branta canadensis*
6. Carrion Crow	*Corvus corone*
7. Common Buzzard	*Buteo buteo*
8. Curlew	*Numenius Arquata*
9. Dunnock	*Prunella modularis*
10. Great Black-Backed Gull	*Larus marinus*
11. Grey Heron	*Ardea cinerea*
12. Greylag Goose	*Anser anser*
13. Herring Gull	*Larus argentatus*
14. Jackdaw	*Corvus monedula*
15. Lapwing	*Vanellus vanellus*
16. Lesser Black-Backed Gull	*Larus fuscus*
17. Magpie	*Pica pica*
18. Mallard	*Anas platyrhynchos*
19. Mediterranean Gull	*Ichthyaetus melanocephalus*
20. Mute Swan	*Cygnus olor*
21. Pink-Footed Goose	*Anser brachyrhynchus*
22. Raven	*Corvus corax*
23. Rock Dove	*Columba livia*
24. Rook	*Corvus frugilegus*
25. Starling	*Sturnus vulgaris*
26. Stock Dove	*Columba oenas*
27. Whooper Swan	*Cygnus cygnus*
28. Woodpigeon	*Columba palumbus*

5.1.4 Initial conclusion

Aviaire concluded that the wildlife species list from MAN was a fair and reasonable interpretation of the WSAC. Aviaire used this list for the final stage of the ecological assessment.

5.2 Final Appraisal

5.2.1 Birds

By assessing the propensity of different bird species to behave in a certain manner (e.g. distances they migrate on a daily basis and to what altitude) Aviaire's SME were able to conclude which bird species were most likely to move up and through the OLS for MAN, or to move in a southerly direction towards or onto the airfield.

This leaves a shortlist of bird species to be used in the DRA of the proposed Project design – see Table 1.

Common Name		Latin Name
1.	Black-Headed Gull	*Chroicocephalus ridibundus*
2.	Carrion Crow	*Corvus corone*
3.	Herring Gull	*Larus argentatus*
4.	Jackdaw	*Corvus monedula*
5.	Lesser Black-Backed Gull	*Larus fuscus*
6.	Rock Dove	*Columba livia*
7.	Rook	*Corvus frugilegus*
8.	Starling	*Sturnus vulgaris*
9.	Stock Dove	*Columba oenas*
10.	Woodpigeon	*Columba palumbus*

Table 1: Finalised List of WSAC for MAN

6 Design Risk Assessment

Aviaire SME have considered the documents supplied which cover the following elements:

1. Buildings and structures

Consideration was given to how changes to the existing environment will directly influence the occurrence, behaviour and abundance levels of the shortlisted species.

All the changes onsite were viewed in context to the surrounding area to assess the overall impact on bird activity onsite and within the 13km area.

- See Figure 1 Project site location
- See Figure 3 Flood risk map for the area for area the Project site

6.1 Building and Infrastructure

In the proposed design:

- Photovoltaic (PV) panels to be installed on the roofs of the apartment blocks.
- The Underside of the panels can be an attractant for Feral Pigeons and Starlings to nest and shelter.
- The gap behind each PV panel can create sheltered spaces that gulls may exploit as nesting sites, using the rear surface of the panels for support.

ACTIONS REQUIRED

- **All photovoltaic (PV) modules shall have their underside fully enclosed using durable bird-proofing measures, such as UV-stabilized netting or rigid exclusion panels, to prevent nesting activity by feral pigeons and starlings. The proofing system must be securely fixed to withstand environmental conditions.**
- **Install anti-perching deterrents, such as stainless-steel bird spikes or equivalent systems, along all exposed panel edges and frame perimeters. These devices should be corrosion-resistant, UV-stable, and securely fixed to prevent displacement under wind load, thereby minimising roosting or loafing opportunities for avian species without compromising panel integrity or maintenance access.**
- **Implement a scheduled inspection protocol for all PV arrays throughout the gull breeding season (circa March to September). Inspections should be conducted at defined intervals to identify and remove any early nesting attempts, thereby eliminating opportunities for Gulls to establish nests. The procedure must comply with wildlife management legislation.**

6.2 Conclusion

To summarise, an increase in the strike risk for aircraft using MAN as a result of this proposed development being introduced into the landscape is assessed as being **NEGLIGIBLE**

This is because:

1. All sub-panel voids will be sealed using approved bird-proofing systems to eliminate potential nesting cavities.
2. Anti-perching deterrents, such as stainless-steel spike arrays or equivalent devices, will be installed along all exposed panel edges and frame perimeters to significantly reduce opportunistic roosting and loafing behaviour

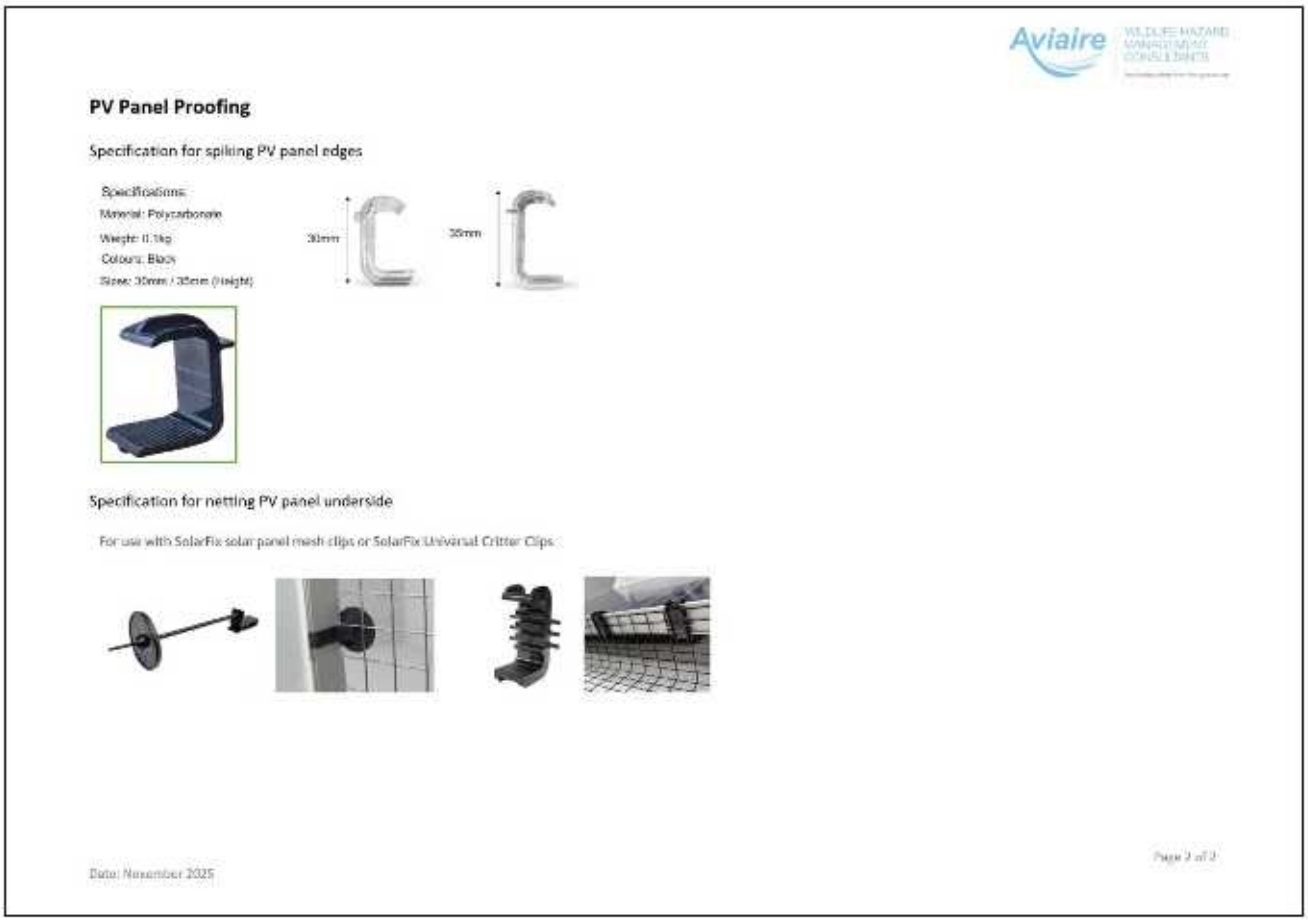
Wildlife Hazard Design Risk Assessment (DRA) Buildings and infrastructure

Plans or Documents under Assessment	Project	Wythenshawe Flats
• TSS - WM170 Solar Panel Mesh - Galv Steel Black PVC Coated 1.2 • speed-clip-tds (3) (2) (1) • 9201-MDA-Z-XX-D-A-211 - Proposed Elevations - Foscarn Drive - REV T01 • 9201-MDA-Z-XX-D-A-212 - Proposed Elevations - Bracken Drive - REV T01 • 9201-MDA-Z-XX-D-A-213 - Proposed Elevations - Glazebury Drive - REV T01 • 9201-MDA-Z-XX-D-A-214 - Proposed Elevations - Wendon Road - REV T01	**DRA Assessment Date**	24/11/2025

Ref No.	Potential Catalyst(s)	Initial Risk Rating	Assessed Potential Hazard	Recommended Actions	Residual Risk Rating	Residual Required Actions
1.	PV Solar Panels	HIGH	• Possible attractant to Starling and Feral pigeon for nesting and roosting under panels	• Ensure bird proofing is included in all detailed drawings and plans • Detailed management plans to be included within the WHMP.	NEGLIGIBLE	Allow for bird proofing system by specialist company if required with egg and nest removal (under licence) if determined necessary.
2.		MEDIUM	• Possible attractant to Gull species for nesting behind panels	• Allow for regular inspections during the Gull breeding season to check for nesting activity.	NEGLIGIBLE	Remove any nesting material from unsuccessful nesting attempts and thoroughly clean the area to prevent reuse of the material.

Key for DRA:

HIGH	Proposal has likely catalyst(s) for elevation in wildlife strike risk ratings if implemented as indicated in provided plans and/or documents. Proposal should be reviewed for agreement on implementation of design variations and/or robust management action(s) to decrease the assessed risk to at least an "medium" state. All agreed management actions will be incorporated in the Wildlife Hazard Management Plan (WHMP) for the project.
MEDIUM	Proposal has likely catalyst(s) for elevation in wildlife strike risk ratings that can be tolerated if implemented as indicated in provided plans and/or documents. All "medium" catalysts require management actions throughout enabling and construction and in-use phases of the project and immediate implementation of design variations and/or additional management action(s) if assessed at some time in the future as starting to actively contribute to an increased wildlife strike risk i.e. have become a RED "high" catalyst. Agreed management actions will be incorporated in the Wildlife Hazard Management Plan (WHMP) for the project.
NEGLIGIBLE	No likely catalyst(s) for elevation in strike risk rating. No required actions at the time of this assessment



PV Panel Proofing

Specification for spiking PV panel edges

Specifications:
Material: Polycarbonate
Weight: 0.1kg
Colours: Black
Sizes: 30mm / 35mm (Height)

30mm

35mm

Specification for netting PV panel underside

For use with SolarFix solar panel mesh clips or SolarFix Universal Critter Clips

Date: November 2025

7.2 Appendix B - Reference Documents for this DRA

This is a list of all project documents and plans supplied by WCHG to Aviaire for inclusion in this DRA:

Document Name
9201-MDA-Z-XX-D-A-211 - Proposed Elevations - Foscarn Drive - REV T01
9201-MDA-Z-XX-D-A-212 - Proposed Elevations - Bracken Drive - REV T01
9201-MDA-Z-XX-D-A-213 - Proposed Elevations - Glazebury Drive - REV T01
9201-MDA-Z-XX-D-A-214 - Proposed Elevations - Wendon Road - REV T01
speed-clip-tds (3) (2) (1).pdf
TSS - WM170 Solar Panel Mesh - Galv Steel Black PVC Coated 1.2.pdf

This document is informed by wildlife hazard management experts and guided by the following documents and resources:

- Airdrome Operators Association (AOA)
  - Advice Note 1 – Aerodrome Safeguarding an Overview (2016)
  - Advice Note 3 – Wildlife Hazards (2016)
- Bat Conservation Trust www.bats.org.uk
- Manchester Airport, List of "Wildlife Species of Aviation Concern", June 2024
- Hampshire Ornithological Club

- British Trust for Ornithology (BTO) www.bto.org
- Dunning Jr., J. (2008). "CRC Handbook of Avian Body Masses"
- Hayhow DB, Ausden MA, Bradbury RB, Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM, (2017), "The state of the UK's birds 2017"
- Flood Data: https://check-long-term-flood-risk.service.gov.uk/map
- International Civil Aviation Organization:
  - ICAO, Annex 14, Aerodromes - Vol I, "Aerodrome Design & Operations", July 2018 (8th Edition)
  - ICAO, Document 9137, Airport Service Manual, "Part 3 - Wildlife Control & Reduction", 2020 (5th Edition)
- Royal Society for the Protection of Birds (RSPB) www.rspb.org.uk
- Royal Society for the Protection of Birds (RSPB), the British Trust for Ornithology (BTO) and the Joint Nature Conservation Committee (JNCC) (2018), "Wild Bird Populations in the UK, 1970 to 2017: 8th November 2018"
- Woodward, I.D., Massimino, D., Hammond, M.J., Harris, S.J., Leech, D.I., Noble, D.G., Walker, R.H., Barimore, C., Dadam, D., Eglington, S.M., Marchant, J.H., Sullivan, M.J.P., Baillie, S.R. & Robinson, R.A., (2018), "BTO Research Report: 708. Bird Trends 2018: trends in numbers, breeding success and survival for UK breeding birds."
- UK Civil Aviation Authority:
  - CAP 168 - Licensing of Aerodromes, March 2019 (Issue 11)
  - CAP 738 - Safeguarding of Aerodromes, October 2020 (Issue 03)
  - CAP 772 - Wildlife Hazard Management at Aerodromes, 2017 (Issue2)
  - Law 139/2014 & CAA 139/2014 Aerodromes AMC GM
- UK DfT; Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002; Updated 22 December 2016

Phase 2
Wythenshawe, Manchester
AVIATION WILDLIFE HAZARD DESIGN RISK ASSESSMENT

Date: November 2025

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