Norwich Western Link Airport Safeguarding Assessment Appendix 4: Wildlife Hazard Management Plan for Airport Safeguarding

Author: Aviaire Ltd

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1 Foreword

This document has been prepared to support compliance with all applicable UK legislation and aviation regulatory standards through guidance aimed to minimise features and activities that will support increased wildlife hazard risks for aircraft using Norwich Airport and its surrounding critical airspace. The Applicant is responsible for ensuring delivery of the required measures in this document.

This document as a whole that includes the strategy and the Codes of Practice is called within the aviation industry a "Wildlife Hazard Management Plan".

Any enquiries relating to this document are to be addressed to the Applicant or Aviaire.

2 Glossary of Abbreviations

AAIB	Aviation Accident Investigation Bureau
AOA	Airdrome Operators Association
BSAC	Bird Species of Aviation Concern
BTO	British Trust for Ornithology
CAA	UK Civil Aviation Authority
DRA	Design Risk Assessment
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicators
OLS	Obstacle Limitation Surface
SARP	Standard and Recommended Practices
SUDS	Sustainable Urban Drainage Systems
WHM	Wildlife Hazard Management

WHMP Wildlife Hazard Management Plan

WSAC Wildlife Species of Aviation Concern

For the benefit of this document:

The term “Proposed Scheme” refers to the “Norwich Western Link project”

The term “Airport” refers to the “Norwich Airport”

The term “The Applicant” refers to “Norfolk County Council”

The terms “Aerodrome” and “Airport” are synonymous.

The term “Appropriate Authority” refers to the party or parties with the decision-making authority and ability to implement the required actions as and when necessary.

3 Reference Documents

The following references have been used by Aviaire in the drafting of this document:

- Aerodrome Operators Association (AOA)
  - Advice Note 1 – Aerodrome Safeguarding an Overview (2016)
  - Advice Note 3 – Wildlife Hazards (2016)
- Aviaire “Wildlife Hazard Management Design Risk Assessment & Suitability Statement”, Rev 2, Nov 2022
- British Trust for Ornithology (BTO)
- Dunning Jr., J. (2008). “CRC Handbook of Avian Body Masses”
- Ferrovial Construction - NCCT41793-02-A-04.00-20210122a-Stage 2 Programme Detailed Works Programme – 01 July 2021
- 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”

- International Civil Aviation Organization, Document 9137, Airport Service Manual, “Part 3 - Wildlife Control & Reduction”, 2020 (5th Edition)
- Royal Society for the Protection of Birds (RSPB)
- 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”
- Wetland Bird Survey (BTO) https://app.bto.org/webs-reporting/
- 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 738 - Safeguarding of Aerodromes, October 2020 (Issue 03)
  - CAP 772 - Wildlife Hazard Management at Aerodromes, 2017 (Issue2)
- UK DfT; Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002; Updated 22 December 2016

4 Introduction

This Wildlife Hazard Management Plan (***WHMP***) has been produced by Aviaire Ltd to ensure the enabling, construction and in-use phases of the Proposed Scheme do not escalate wildlife hazard risks for aircraft using Norwich Airport (the ***Airport***) and its surrounding critical airspace.

The content of this document has been informed by the following:

- The results of Wildlife Hazard Design Risk Assessments (document reference 4.05.04) undertaken in the design stages for the Proposed Scheme [1];
- The Proposed Scheme detailed programme of works for enabling, construction and in-use phases [2].

This WHMP supports the planning application for the Proposed Scheme and consultation processes with the Airport. It details how compliance with good practice in wildlife hazard management and airport safeguarding should be achieved throughout enabling, construction and in-use phases or until Norwich Airport is no longer operational (whichever is sooner).

Full adherence to the Management Strategy and Codes of Practice (See Section 8 and Sections 10.4 - 10.9 respectively) , and mutually agreed Key Performance Indicators (***KPI***) (See Section 10.10), will support two key objectives:

1. No elevation in onsite populations for the defined Wildlife Species of Aviation Concern (***WSAC***) for Norwich Airport; and
2. No contribution towards an elevation in wildlife strike risks for aircraft using Norwich Airport and its surrounding critical air space.

This supports the UK “Town & country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002 [Updated 22 Dec 2016].

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[1] Proposed Scheme planning application documents: 4.05.04 and 4.05.06

[2] Ferrovial Construction - NCCT41793-02-A-04.00-20210122a-Stage 2 Programme Detailed Works Programme – 01 July 2021

5 Project Overview

The Proposed Scheme will connect the western end of Broadland Northway (formerly the Northern Distributor Road) to the A47.

5.1 Site overview

5.1.1 Site name

- Proposed Scheme – Norwich Western Link

5.1.2 Site location

- The Proposed Scheme will commence at the western end of Broadland Northway (formerly Northern Distributor Road) and connect onto the A47
- See Appendix A for Proposed Scheme's location maps.

5.1.3 Site description

The Proposed Scheme is a new section of dual carriageway to connect the Broadland Northway (formerly known as the Northern Distributor Road) between the A1067 and the A47 in the west of Norwich.

Norwich Airport is situated to the east of the project site, circa 4.6 miles (7.41 km) to the northern end of the site, and 7.78 miles (12.52 km) to the southern end of the site.

At present the site comprises open countryside with a mix of arable and pastoral farming, woodland, and wetland.

Figure 1: Proposed northern intersection

Figure 2: Example of a wetland area on the proposed scheme site

Figure 3: Example of arable farming and woodlands on the proposed scheme site

Figure 4: Example of pastoral farming on the proposed scheme site

5.2 Aviation wildlife hazard management

5.2.1 Wildlife strikes

Wildlife hazard management is the process of mitigating against the likelihood of a strike (collision) between wildlife and an aircraft, where wildlife can be birds, mammals, reptiles or insects.

Wildlife hazard strikes are known to take place in all phases of flight for fixed-wing and rotary aircraft with circa 95% of strikes for all aircraft occurring below 3,000ft.

The phases of flight for fixed-winged and rotary aircraft at risk from wildlife strikes are as follows:

Phase of Flight	Wildlife Strike Risk
Manoeuvring on the aerodrome	Birds, mammals, reptiles and insects
Take-off flight path	Birds, bats and insects
Final approach	Birds, bats and insects
On missed approaches	Birds, bats and insects
In circuit around an airport	Birds, bats and insects
On route	Birds, bats and insects

It is an aviation priority to reduce wildlife strikes to increase air safety. A severe strike can have human health and safety, legal, financial and environmental consequences. Minor strikes and near misses can be costly, with knock-on business, legal and reputational impacts.

5.2.2 Safeguarding zone for an aerodrome

International Civil Aviation Organisation (ICAO) has set the safeguarding zone for an aerodrome, such as Norwich Airport, at 13 km from the airfield reference point.

Because wildlife are mobile, sites and natural features on and surrounding an aerodrome increase the risk of wildlife strikes because they all can harbour attractions for feeding, roosting, breeding drinking bathing, shelter and security. This increases the potential number of wildlife occurring on an aerodrome and the number of birds, bats and insects using the airspace surrounding an aerodrome.

5.2.3 Standard and recommended practices (SARP)

There are standard and recommended practices (**SARP**) from UK regulators and the wildlife hazard management industry that support minimisation of wildlife strike risks.

All development projects are expected to adopt and abide by relevant sections of

these SARP for the design, planning, construction and maintenance phases of a project. In regard to aerodrome safeguarding and wildlife hazard management, this starts with the Principal Designer of a project ensuring the design team are aware of the relevant sections in at least the following documents:

- **ICAO**
  - Annex 14, Aerodromes - Vol I, “Aerodrome Design & Operations”
  - Doc 9137, Airport Service Manual, “Part 3 - Wildlife Control & Reduction”
- **UK Civil Aviation Authority (CAA):**
  - CAP 738 “Safeguarding of Aerodromes”
  - CAP 772 “Wildlife Hazard Management at Aerodromes”

5.2.4 UK planning legislation

All local planning authorities (LPA) are expected to abide by the UK’s “Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002” [Updated 2016]. This sets out a requirement for LPAs to officially safeguard some 40 UK civil aerodromes, one of which is Norwich Airport.

In regard to safeguarding requirements, the directive sets out the expectation for an LPA to ensure the following in its planning decision process:

1. No elevation in onsite populations of the wildlife species of aviation concern; and
2. No contribution towards an elevation in wildlife strike risks for aircraft using the subject aerodrome(s) and surrounding critical airspace.

5.3 Aerodromes within 13km of the proposed scheme site

All development projects should take into consideration fixed-wing aerodromes within 13 km of the proposed site, and formal helicopter landing sites within 1.5 km of the proposed site.

5.3.1 Officially safeguarded aerodromes

Norwich Airport

Norwich Airport is 7.42 km from the most northern aspect of the Proposed Scheme site, and 12.46 km from the most southern aspect – See Appendix A for a map indicating proximities.

Norwich Airport is officially safeguarded aerodrome under the UK DfT: Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002 [Updated 2016]

Element	Description
Airport name	Norwich Airport
Airport identification codes	IATA: NWI ICAO: EGSH
Airport location	Immediately adjacent to the Proposed Scheme along its northwest site boundary
Airport operator	Norwich Airport is owned and operated by Regional & City Airports (RCA), part of Rigby Group plc.
Hours of operation	At the date of this document: 4:00AM – 10:30PM (Mon, Thurs, Sat) 4:00AM – 11:00PM (Tues) 4:00AM – 10:450PM (Wed) 4:00AM – 10:15 (Fri, Sun).
Elevation	36 m (117 ft) AMSL
Runways	Runways 09/27. 1,841 metres in length (4,216ft), Asphalt
Air traffic profile	Commercial, corporate, charter and flight training
Navigation aids	Full navigational aids, approach radar and communications

5.3.2 Non-officially safeguarded aerodromes

Norfolk and Norwich University Hospital

Hospital Emergency Medical Services (HEMS) helicopters use the landing site at Norfolk and Norwich University Hospital which defines it as “a helicopter landing site at an establishment of high public interest (hospitals)”. There are no statutory requirements to safeguard these types of landing sites however good practice in aviation safeguarding is “encouraged” by the UK DfT: Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002 [Updated 2016].

It is also a non-officially safeguarded aerodrome under the UK DfT: Town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002 [Updated 2016].

The Norfolk and Norwich University Hospital helicopter landing site is 7.68 km from the Proposed Scheme, therefore the Proposed Scheme does not come within the hospital landing site safeguarded zone. Helicopter flight operations to and from the hospital will though benefit from the Proposed Scheme safeguarding precautions against wildlife hazards for the Norwich Airport.

6 Target Wildlife Species for Control and Dispersal

This section identifies the priority Wildlife Species of Aviation Concern (***WSAC***) for population control and dispersal as determined in September 2022

1. Barn Owl
2. Black-Headed Gull
3. Canada Geese
4. Carrion Crow
5. Collared Dove
6. Common Buzzard
7. Common Gull
8. Coot
9. Cormorant
10. Egyptian Goose
11. Feral Pigeon
12. Greater Black Backed Gull
13. Grey Heron
14. Greylag Goose
15. Herring Gull
16. Jackdaw
17. Jay
18. Kestrel
19. Lapwing
20. Lesser Black-Backed Gull
21. Little Egret
22. Magpie
23. Mallard
24. Moorhen
25. Mute Swan
26. Peregrine
27. Rook
28. Starling
29. Stock Dove
30. Tufted Duck
31. Woodpigeon

This list is based on discussions between Aviaire subject matter experts and Norwich Airport [3] using the following documents and information available within the public domain for the project area:

- Norwich Airport wildlife hazard management documentation
- Royal Society for the Protection of Birds (RSPB)
- The British Trust for Ornithology (BTO)
- The Joint Nature Conservation Committee (JNCC)

[3] Liaison meeting between Aviaire and Norwich Airport occurred on 9th September 2022

See Appendix B for the full list of the bird species of aviation concern for Norwich Airport, determined through a wildlife strike risk assessment that complies with UK CAA and ICAO SARP [4]

These species are those assessed as being of highest wildlife strike risk for aircraft using Norwich Airport due to the calculated species damage severity ratings and probability of occurring above the Airport's Obstacle Limitation Surface (***OLS***).

Mammal, reptiles and insects were consider in this process however none were, at this point in time, considered to be species of aviation concern to be taken into consideration on the NWL project. Therefore, from here on forward in this document, only the Bird Species of Aviation Concern (**BSAC**) are taken into consideration in the assessment and outcomes.

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

7 Risk Assessment of Planned Project Site Activities and Features

A full design risk assessment was completed by Aviaire Limited in November 2022 on the Proposed Scheme site activities and features [5].

In summary, having appraised the Proposed Scheme plans and documents, Aviaire assessed there were catalysts which, at some time, could contribute towards an elevation in wildlife strike risk for aircraft using the subject aerodrome and/or their surrounding critical airspace. However, after consultation with the Norwich Airport, it was concluded that sufficient measures had been taken in the design to mitigate against elevations in wildlife hazard risks for aircraft using Norwich Airport and the risk rating on all supplied plans could be turned to "negligible".

This WHMP for the Proposed Scheme identifies the required management actions in the next phases of the Proposed Scheme i.e. enabling, construction and in-use.

7.1 Assessment of enabling works phase

In preparation of the site for main works, activities to create main welfare facilities, management of utilities will give rise to hazards that need to be managed to minimise the attractions for BSAC.

The below table shows the identified hazards (attractions for the BSAC) to be managed during this phase of works:

Continued on next page ...

[5] Proposed Scheme planning application documents: 4.05.04 and 4.05.06

Hazards	Attractant Behaviour	Attracted BSAC
1. Opened ground – exposing invertebrates within the topsoil	• Feeding • Loafing	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant Behaviour	Attracted BSAC
2. Soil mounds – creating attractive new feeding locations	• Feeding • Loafing	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant Behaviour	Attracted BSAC
3. Temporary attenuation ponds, basins and standing water	• Feeding • Drinking • Bathing	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant Behaviour	Attracted BSAC
4. On site flooding, water pooling on impermeable surfaces and standing water	• Feeding • Drinking • Bathing	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull
5. Management of existing trees and soft landscaping	• Roosting • Nesting • Loafing	• Carrion crow • Common buzzard • Feral pigeon • Jackdaw • Magpie • Rook • Starling • Woodpigeon

Hazards	Attractant Behaviour	Attracted BSAC
6. Overflowing skips, waste bins and unsecured waste bags	• Feeding	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Lesser Black-Backed Gull

Hazards	Attractant Behaviour	Attracted BSAC
7. Inappropriately discarded food and litter	• Feeding	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Lesser Black-Backed Gull

Hazards	Attractant Behaviour	Attracted BSAC
8. People feeding birds	• Feeding	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Lesser Black-Backed Gull
9. Periods of no activity site on the project site i.e. bank holidays and weekends	• Feeding • Drinking • Roosting • Nesting • Loafing	• All current wildlife species of concern Periods of no activity site on the project site i.e. bank holidays and weekends

7.2 Assessment of construction phase

During construction works to build the Proposed Scheme with its green bridges and viaduct, there will be activities that will give rise to hazards that need to be managed to minimise the attractions for bird species of aviation concern.

The below table shows the identified hazards (attractions for the BSAC) to be managed during this phase of works:

Hazards	Attractant behaviour	Attracted BSAC
1. Earthworks, including clearing, grubbing, breaking out and scarification	• Feeding	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • CommonBuzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
2. Exposed sections of soil, including during creation of embankments and settlement periods	• Feeding	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
3. Fill with topsoil	• Feeding	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
4. Drainage works – Including creation of Sustainable Urban Drainage Systems (SUDS)	• Feeding • Drinking • Bathing	• Canada Geese • Common Gull • Coot • Cormorant • Egyptian Goose • Grey Heron • Herring Gull Mallard • Lesser Black-Backed Gull • Mute Swan • Moorhen • Little Egret • Tufted Duck • Greylag Goose • Black-Headed Gull
5. Finishes - Street Lighting	• Loafing	• Carrion crow • Common gull • Feral pigeon • Jackdaw • Magpie • Rook • Black-headed gull • Starling • Woodpigeon

Hazards	Attractant behaviour	Attracted BSAC
6. Finishes – Landscaping	• Roosting • Nesting • Loafing	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
7. Management of existing soft landscaping	• Roosting • Nesting • Loafing	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
8. Management of existing trees	• Roosting • Nesting • Loafing	• Herring Gull • Barn Owl • Kestrel • Lapwing • Peregrine • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Greater Black Backed Gull • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
9. Overflowing skips, waste bins and unsecured waste bags	• Feeding	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Lesser Black-Backed Gull

Hazards	Attractant behaviour	Attracted BSAC
10. Inappropriately discarded food and litter	• Feeding	• Herring Gull • Jackdaw • Jay • Magpie • Rook • Starling • Stock Dove • Woodpigeon • Black-Headed Gull • Carrion Crow • Collared Dove • Common Buzzard • Common Gull • Feral Pigeon • Lesser Black-Backed Gull
11. Periods of no activity site on the project site i.e. bank holidays and weekends	• Feeding • Drinking • Bathing • Roosting • Nesting • Loafing	• All current BSAC
12. People feeding birds	• Feeding	• All current BSAC

7.3 Assessment of the in-use phase

During the in-use phase of the Proposed Scheme, attractions for bird species of aviation concern could develop over time that need to be avoided in order to avoid

an escalation in strike risks for aircraft using Norwich Airport.

The below table shows the identified hazards (attractions for the BSAC) to be managed during this phase of works:

Hazards	Attractant behaviour	Attracted BSAC
1. Deterioration of structures providing shelter and accessible voids for birds of concern	• Nesting • Loafing • Roosting	• Feral pigeon • Starling • Kestrel
2. Loss of installed bird proofing	• Nesting • Loafing • Roosting	• Feral pigeon • Starling • Kestrel
3. Unmanaged soft landscaping	• Nesting • Loafing • Roosting	• Carrion crow • Common buzzard • Feral pigeon • Jackdaw • Magpie • Rook • Starling • Woodpigeon

8 Proposed Scheme Wildlife Hazard Management Strategy

8.1 Aim

To mitigate on the Proposed Scheme against:

1. An elevation in onsite populations for the wildlife species of aviation concern; and
2. A contribution towards an elevation in wildlife strike risks for aircraft using the Airport and in its surrounding critical airspace.

This should be in perpetuity or until Norwich Airport is no longer operational.

8.2 Goal

The ultimate goal is to protect aircraft passengers, flight crews, aircraft, the operational capability of the Airport, all persons on the airport site and in its surrounding local community.

This will be achieved by supporting a reduction in the likelihood of wildlife strikes for all aircraft using the Airport and surrounding critical airspace above the OLS.

8.3 Key objective

The key objective is to achieve the above aim and goal through the application of continual good practice in wildlife control across the project site throughout each of the following phases:

1. Enabling works
2. Construction works
3. Post-handover and in-use

8.4 Site management

Management for the Proposed Scheme will be fully committed in all three phases to supporting the above aims and goal as far as reasonably and practicably possible in proportion to the scale of formally assessed wildlife strike risks.

Management for the Proposed Scheme will adopt a risk-based approach to

supporting this commitment and they will ensure risk reduction is implemented promptly in accordance with recommendations in this Plan, relevant UK legislation, regulatory and industry SARP.

Management for the Proposed Scheme will ensure that all required measures are implemented, and efforts made to minimise the increase in wildlife hazard risks are maintained.

8.5 Required outcomes

This is a list of required outcomes throughout the life of the Proposed Scheme:

1. Regular assessment of wildlife activity on-site during both periods of site activity and periods no activity. Responsibilities and frequency rates for this assessment will be mutually agreed as part of the Key Performance Indicators (**KPI**) with the Airport.
2. Successful implementation of controls to minimise the attraction of identified features and activities for the BSAC, as directed by this WHMP.
3. Consideration of all the following (as a minimum) when seeking to achieve successful BSAC control:
    - Future variations / capital developments
    - Maintenance of existing and new landscape and structures
    - Waste management during all phases of the project
    - Mothballing of any structures during any stages of the project
    - Social behaviour of all persons working, using or visiting the site i.e. contractors, visitors and public.
4. Adherence to codes of practice in this WHMP for at least the following:
    - Enabling and construction works
    - Design and management of existing and new trees
    - Design and management of soft and hard landscaping
    - Design and management sustainable urban drainage works (SUDS)
    - Waste management (including litter management)

5. An adaptive, risk management approach to BSAC control under what will be a changing environment.
6. Good education and communications amongst at least the following key stakeholder groups so they understand and support successful BSAC control on the site. The use of fair and reasonable performance goals is advised.
    - Site managers
    - People working on site
    - People visiting the site
    - People using the site
7. Periodic liaison meetings and reporting to the Airport to be at a frequency set in the KPI agreed with the Airport.

9 Proposed Scheme Wildlife Hazard Management Actions

This section lays out the actions required as a minimum to ensure compliance with the aims of the Proposed Scheme Wildlife Hazard Management Strategy of:

1. No elevation in onsite populations for bird species of concern; and
2. No contribution towards an elevation in bird strike risks for aircraft using the Airport and its 13 km surrounding critical air space.

Success in the delivery of the actions will be achieved through robust implementation in accordance with codes of practice within this WHMP.

9.1 Strike risk assessments

Phase	Required action	Frequency	Action Owner
Prior to the start of works on site	A baseline wildlife hazard risk assessment based on strike records and species occurrence records over the 5 years prior to the commencement of works	One month in advance of the start of works.	To be agreed with the Airport as part of the KPI
Throughout all phases	Wildlife Hazard Risk Assessments	Bi-annually	To be agreed with the Airport as part of the KPI

9.2 Monitoring

WHM monitoring is required to support risk assessments and to inform required reports. It should be carried out as follows:

Phase	Required action	Duration	Frequency	Action Owner
Throughout all phases, across the complete site	Monitoring for variances in BSAC activity and presence	In perpetuity or until Airport no longer operating	As per agreed KPI	To be agreed with the Airport as part of the KPI

9.3 Management procedures

Included in Appendix C - H are codes of practice for adoption by the Proposed Scheme Site Management to support successful delivery of BSAC control against the aim, goal and objectives in the Proposed Scheme's Wildlife Hazard Management Strategy.

These Codes of Practice are standard codes of practice used within the WHM industry based on AOA advice notes but advanced to a more detailed level to provide better guidance for project designers and site managers. They have been developed by WHM Subject Matter Experts (SME) with longstanding experience in working on development projects within safeguarded zones for aerodromes.

This list of Code of Practice included in the appendices and their content should always be reviewed on at least an annual basis or following a confirmed wildlife strike (whichever is sooner) to ensure all relevant matters have been covered.

These practices should be supported by t (but not limited to) the Proposed Scheme's Construction and Environmental Management Plan (CEMP), Ecological Mitigation Strategy and Outline Bat Mitigation Strategy, Hydrology Strategy and landscape management plan.

All Contractors should also use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

9.4 Quality assurance

The following table of quality control measures are required to ensure that

management on the site in all stages of the development do not deviate from required practices as stated below.

Activity	Quality Assurance Process
Pest Control	Industry good practice in pest and vermin control to be undertaken on site throughout enabling and construction works promptly and as required to mitigate the likelihood of attracting BSAC. This is in keeping with a normal expectation in the project's Construction and Environmental Management Plan (CEMP) so should require no additional effort by the Applicant.
Use of appropriate reasonable wildlife deterrent techniques and equipment	Industry good practice in the use of appropriate wildlife deterrent equipment will mitigate the likelihood of BSAC. Deterrent equipment must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife.
Key Performance Indicators	KPI mutually agreed with the airport are to ensure that minimal reasonable standards in wildlife hazard management are maintained on site in perpetuity or until the Airport is no longer operational.

Activity	Quality Assurance Process
Record Keeping	Record Keeping is for the future benefit of the accountable party or parties at any stage in the lifetime of the development to demonstrate (evidence) the following: ▪ All reasonable wildlife hazard management actions have been taken; ▪ All reasonable wildlife hazard management training have been provided; ▪ All necessary records, reports and reviews are available and have been provided as agreed with the Airport. ▪ All reasonable communications with key relevant stakeholders have been undertaken to ensure all reasonable wildlife hazard management actions have planned and undertaken. Records will need to be made immediate available to one of more of the following on request in the instance of a formal investigation or to inform an airport review of a wildlife strike related incident: ▪ The Airport ▪ The LPA ▪ Air Accidents Investigation Branch ▪ UK Civil Aviation Authority

9.5 Roles and responsibilities

Below are the parties responsible for overseeing required actions at different phases of the project to ensure prompt and successful mitigation of likely elevations in populations numbers for the BSAC and bird strike risks:

Table 9-1 Site roles and responsibilities

Phase	Action Owners
Prior to the start of works	▪ The Principal Designer and CDM Advisor (where applicable)
Enabling and Construction Phase	▪ The Main Contractor and sub-contractors
Operational Phase	▪ The Applicant and/or nominated Contractor(s)

9.6 Site management responsibilities

It is for the Applicant to ensure site-wide adoption and continual support of the Proposed Scheme's WHMP.

This includes:

1. Ensuring there is a Proposed Scheme's key point of contact for wildlife hazard management throughout the enabling and construction works.
2. Ensuring all site-related personnel, including site contractors and service providers:
    - Understand the importance of aviation wildlife hazard management;
    - Understand the implications of not following required wildlife management procedures and initiating necessary improvements;
    - Are accountable through the use of RAMS for supporting successful delivery of the WHMP.
    - Have adequate knowledge, competency, equipment and resources to implement delegated sections of the wildlife management procedures.
3. Ensuring full and continuous support of all applicable WHM related statutory and regulatory obligations, and WHM industry codes of good practice.
4. Ensuring full implementation of this WHMP as a whole and to support periodic reviews and improvement plans;
5. Ensuring any required wildlife data collection and records are correctly collated and maintained in a manner that can be easily interrogated;

6. Ensuring, in the instance of a wildlife strike at the Airport or in its 13 km safeguarded zone, the Proposed Scheme will fully support as required a review of the strike incident for the purposes of formal investigation, constructive feedback and/or learning;
7. Ensuring all required training, permits and licences are current;
8. Ensuring the supply and safe keeping of any wildlife control equipment.

On a daily basis at a site level, key accountability for WHM is with the project's Site Manager (or equivalent) to ensure all reasonable effort is undertaken to avoid BSAC population increases and no elevation in wildlife strike risk for aircraft using the Airport.

It is for the Site Manager to ensure:

- Continuous compliance with all applicable obligations in this WHMP, including the production and checking of RAMS.
- Continuous good practice in wildlife hazard management within current statutory and regulatory expectations and against good practice, even during times of site activity or use e.g. weekends or bank holidays.
- Any applicable wildlife activity monitoring is undertaken across the whole site no less than as per the agreed KPI, with records made in an official logbook.
- It is advisable a logbook is kept at a designated location on-site and be available for audit/review at any stage without prior arrangement by the Airport, the Aviation Accident Investigation Bureau (AAIB) or the CAA.
- In addition, the bird management procedures and staff training records will also be available for inspection, again without prior arrangement.
- Project participation in Airport review / liaison meetings as per agreed KPI.

Should the site manager have concerns about bird numbers and activity due to unexpected or seasonal bird activity following adoption of aforementioned measures, the activity should be recorded in the site logbook and contact will be made with the project WHM subject matter expert or the Airport for advice. Any

advice should be acted on promptly unless otherwise advised.

Contact details for the Airport's wildlife hazard management point of contact must be permanently on display in the site office to support emergency situations.

9.7 Education and communications

There is a need to educate and communicate with various stakeholders at all phases in the life of the Proposed Scheme to ensure:

- Full compliance with obligations in this WHMP.
- Successful mitigation of likely elevations in populations of the BSAC and bird strike risks.
- Assurance as required for (at least) the Airport, the LPA and (when applicable) the CAA.

9.7.1 Education:

The below table shows the identified actions to be delivered during each phase of works:

Phase	Required action	Stakeholder Group(s)	Frequency
1. All phases of enabling and construction works	**Pre-Construction Information Pack** to include a copy of the WHMP and template documents for use by the Site Manager to ensure good practice	• Principal Advisor / party responsible for compiling the Pre-Construction Information Pack	Prior to the start of works.

Phase	Required action	Stakeholder Group(s)	Frequency
2. All phases of enabling and construction works	**Initial Site Training** on minimally required wildlife hazard management during enabling works, infrastructure works and construction.	• Main Contractor and sub-contractors	To be ready prior to the start of any works AND Periodic refreshment training, toolbox talks and review of documents in used to maintain satisfactory level of understanding and compliance.
3. All phases of enabling and construction works	**Site Induction** to ensure good practice in Wildlife Hazard Management through site Induction paperwork or videos and guidance documents.	• Main Contractor and Sub-contractors	Prior to the start of work on site

Phase	Required action	Stakeholder Group(s)	Frequency
4. All phases of enabling and construction works	**RAMS:** To include acknowledgement of hazards to be managed (see WHMP) with appropriate method statements that must be complied with.	• Main Contractor and Sub-contractors	For completion and approval by a suitably knowledgeable person ahead of the start of any new works. For enforcement by Site Management
5. All phases of enabling and construction works	**Signage**: Clear and frequent across the site ensure compliance with required personnel and visitor behaviour	• Main Contractor	Installation prior to start of works, and to be maintain throughout all phases of construction
6. For all in-use or mothballed phases of the site	**Handover Information Pack** to include a copy of the WHMP and template documents for use by the appropriate parties to ensure good practice on site	• The Applicant and/or nominated Main Contractor(s)	Prior to handover.

Phase	Required action	Stakeholder Group(s)	Frequency
7. For all in-use or mothballed phases of the site	**Initial Site Training** on minimally required wildlife hazard management during in-use or mothballed phases of the site.	• The Applicant and/or nominated Main Contractor(s)	To be ready prior to start of any works AND Periodic refreshment training, toolbox talks and review of documents in use to maintain understanding and compliance.
8. For all in-use or mothballed phases of the site	**RAMS:** To include acknowledgement of hazards to be managed (see WHMP) with appropriate method statements.	• The Applicant and/or nominated Main Contractor(s)	For completion and approval by a suitably knowledgeable person ahead of the start of any new works. For enforcement by Site Management

Phase	Required action	Stakeholder Group(s)	Frequency
9. For all in-use or mothballed phases of the site	**Site Induction**: Good practice in Wildlife Hazard Management Site Induction paperwork / videos	• The Applicant and/or nominated Main Contractor(s)	To be ready prior to the start of any works AND Periodic refreshment training, toolbox talks and review of documents in used to maintain satisfactory level of understanding and compliance
10. For all in-use or mothballed phases of the site	**Signage**: Clear and frequent signage to indicate required social behaviours	• The Applicant and/or nominated Main Contractor(s)	Installation prior to handover and to be maintained throughout all subsequent phases.

9.7.2 Communications

The below table shows the identified actions to be delivered on the frequency indicated:

Action	Purpose	Author	Recipient Stakeholders
1. Monthly Report	**Monthly NWL WHM Report** to include: 1) NWL site BSAC occurrence and behaviour report; 2) WHM exception report against WHMP obligations.	▪ The Main Contractor, to self-report	▪ The Applicant ▪ Site personnel (via site noticeboard and toolbox talks)
2. Quarterly Review	**Quarterly WHM performance review t**o include: 1) NWL site BSAC occurrence and behaviour;	▪ The Main Contractor, to self-report	▪ The Applicant ▪ Site Personnel (Via Site signage And Toolbox Talks) ▪ The Airport, for assurance and as pre-read for liaison meetings.
3. Quarterly Review	2) Site WHM exceptions against WHMP obligation; and 3) Three months look forward against expected site works and seasonal changes.	▪ The Main Contractor, to self-report	▪ The Applicant ▪ Site Personnel (Via Site signage And Toolbox Talks) ▪ The Airport, for assurance and as pre-read for liaison meetings.

Action	Purpose	Author	Recipient Stakeholders
4. Quarterly Review	**Quarterly Norwich Airport (NWL) Report r**efreshing: 1) NWL BSAC; 2) NWL strike risk ratings, and 3) Three months look forward against expected seasonal changes.	▪ The Airport	▪ The Applicant ▪ The Main Contractor, for assurance and as pre-read for liaison meetings.
5. Annual Reviews	**Annual Performance Review** to include: 1) NWL site BSAC occurrence and behaviour report; 2) Site WHM exceptions against WHMP obligation; and 3) An overview on any required changes in WHM over next 12 months, confirming any required personnel training and equipping.	▪ The Main Contractor, to self-report	▪ The Applicant ▪ Site Personnel (Via Site Noticeboard And Toolbox Talks) ▪ The Airport, for assurance and as pre-read for liaison meetings.

9.7.3 Important Contact Details

The following information is to be reviewed regularly and displayed clearly at all times in the Project site office for quick reference:

Key WHM contact in an emergency:

Name:	
Address:	
Tel:	
Mob:	
Email:	

9.8 Assurance

9.8.1 Liaison Meetings

Phase	Purpose	Required attendees
Before the start of enabling and construction works	Agreement of WHM KPI Must be agreed to support consistent measurement of wildlife hazard management performance	▪ Site Manager ▪ The Airport ▪ Site WHM subject matter experts
In all phases **	**Periodic review meetings** to appraise wildlife management performance, to agree actions to resolve ongoing risks and issues, and to confirm resolution of previous quarters risks and issues	▪ Site Manager ▪ The Airport ▪ Site WHM subject matter experts

** Liaison meetings with the Airport must start at least one month in advance of the start of new works and at a regularity thereafter as per the agreed KPI

10 Appendices

10.1 Appendix A – Proposed scheme location maps

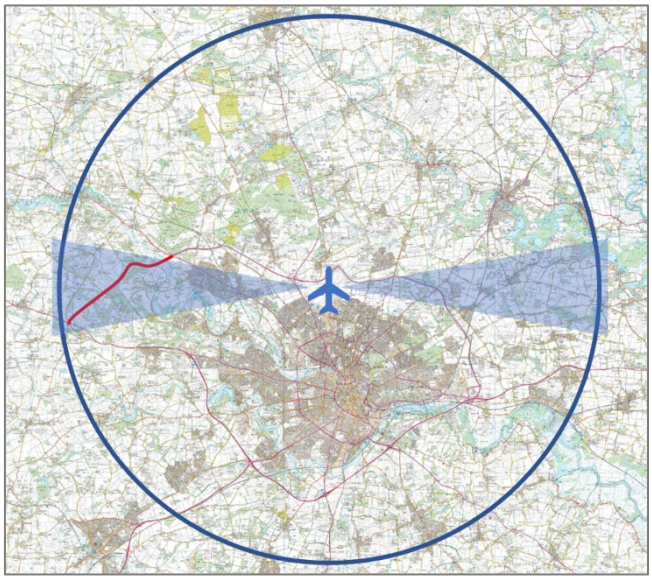


Figure 5: Norwich Airport 13km safeguarded zone and site location map

Key:	
	Norwich Western Link Site – The Proposed Scheme
	Norwich Airport approach and climb out zones
	Norwich Airport
	Airport 13 km safeguarded zone

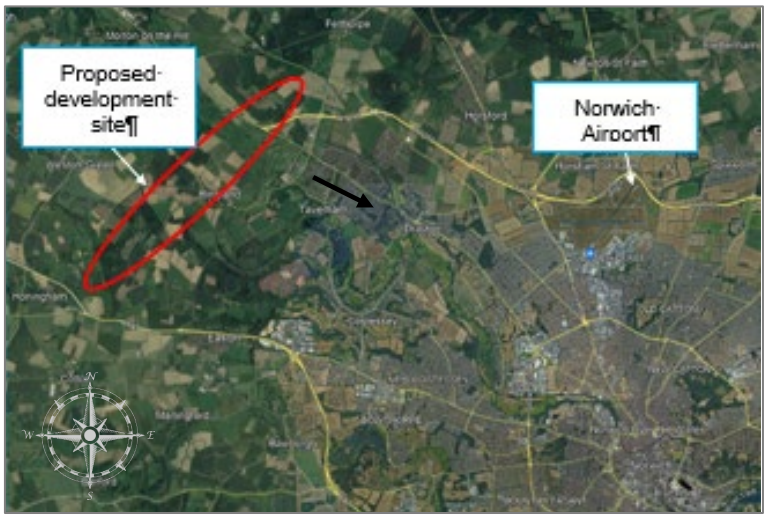


Figure 6: Proposed Scheme location as produced by the Applicant

10.2 Appendix B - Norwich Airport wildlife species of aviation concern

Wildlife Species of Aviation Concern Assessment Results

Review Date: 25/11/2022

Review Range: 01 Jan – 31 Dec 2020

Zone under review: On aerodrome and its surroundings

See Table 6 for the results of the Wildlife Species of Aviation Assessment for Norwich Airport in November 2022.

These results are based on risk assessment processes recommended in ICAO Document 9137 and ICAO Document 9859.

		PROBABILITY				
		VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
SEVERITY	VERY HIGH	5A	4A	3A	2A	1A
	HIGH	5B	4B	3B	2B	1B
	MODERATE	5C	4C	3C	2C	1C
	LOW	5D	4D	3D	2D	1D
	VERY LOW	5E	4E	3E	2E	1E

Figure 7: Air Safety (Strike) Risk Assessment Matrix used in the Wildlife Species of Aviation Assessment

See next page for Table 6 ...

Table 2: Wildlife Species of Aviation Concern Assessment Results

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Barn Owl	More than 200 days	Very High	403	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Black-Headed Gull	50 - 100 days	Moderate	284	8	Often in loose flocks	2	16	High	HIGH	3B
Canada Geese	50 - 100 days	Moderate	3060	16	Often in loose flocks	2	32	Very High	HIGH	3A
Carrion Crow	More than 200 days	Very High	570	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Collared Dove	More than 200 days	Very High	149	4	Often in loose flocks	2	8	Moderate	HIGH	5C
Common Buzzard	More than 200 days	Very High	875	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Common Gull	50 - 100 days	Moderate	403.5	8	Often in loose flocks	2	16	High	HIGH	3B
Common Sandpiper	50 days	Low	48	2	Often in loose flocks	2	4	Low	LOW	2D
Coot	More than 200 days	Very High	836	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Cormorant	More than 200 days	Very High	2935	16	Usually solitary or widely spaced	1	16	High	HIGH	5B
Egyptian Goose	50 - 100 days	Moderate	1873	16	Often in loose flocks	2	32	Very High	HIGH	3A
Feral Pigeon	More than 200 days	Very High	354.5	8	Often in loose flocks	2	16	High	HIGH	5B
Fieldfare	50 days	Low	106	4	Often in tight flocks	4	16	High	MEDIUM	2B
Gadwall	50 - 100 days	Moderate	917	8	Usually solitary or widely spaced	1	8	Moderate	MEDIUM	3C

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Golden Plover	50 days	Low	135	4	Often in loose flocks	2	8	Moderate	LOW	2C
Greater Black Backed Gull	50 - 100 days	Moderate	1658.5	16	Usually solitary or widely spaced	1	16	High	HIGH	3B
Grey Heron	More than 200 days	Very High	1443	16	Usually solitary or widely spaced	1	16	High	HIGH	5B
Greylag Goose	100 - 200 days	High	3308.5	16	Often in tight flocks	4	64	Very High	HIGH	4A

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Herring Gull	100 - 200 days	High	1085	16	Often in loose flocks	2	32	Very High	HIGH	4A
Jackdaw	More than 200 days	Very High	246	8	Often in loose flocks	2	16	High	HIGH	5B
Jay	More than 200 days	Very High	168	4	Usually solitary or widely spaced	1	4	Low	HIGH	5D
Kestrel	More than 200 days	Very High	184	4	Usually solitary or widely spaced	1	4	Low	HIGH	5D
Lapwing	50 - 100 days	Moderate	218.5	8	Often in tight flocks	4	32	Very High	HIGH	3A

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Lesser black-backed gull	100 - 200 days	High	715	8	Often in loose flocks	2	16	High	HIGH	4B
Little Egret	More than 200 days	Very High	312	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Little Grebe	50 days	Low	135	4	Usually solitary or widely spaced	1	4	Low	LOW	2D
Little Ringed Plover	50 days	Low	38.7	2	Often in loose flocks	2	4	Low	LOW	2D

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Magpie	More than 200 days	Very High	206	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Mallard	More than 200 days	Very High	1082	16	Usually solitary or widely spaced	1	16	High	HIGH	5B
Moorhen	More than 200 days	Very High	382	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Mute Swan	More than 200 days	Very High	10735	32	Often in loose flocks	2	64	Very High	HIGH	5A
Oyster-catcher	50 days	Low	526	8	Often in loose flocks	2	16	High	MEDIUM	2B

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Peregrin	More than 200 days	Very High	811	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C
Pintail	50 days	Low	946.5	8	Usually solitary or widely spaced	1	8	Moderate	LOW	2C
Pochard	50 days	Low	823	8	Usually solitary or widely spaced	1	8	Moderate	LOW	2C
Redwing	50 days	Low	61.5	4	Often in tight flocks	4	16	High	MEDIUM	2B
Rook	More than 200 days	Very High	453.5	8	Often in loose flocks	2	16	High	HIGH	5B

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Shoveler	50 days	Low	614.5	8	Usually solitary or widely spaced	1	8	Moderate	LOW	2C
Starling	50 - 100 days	Moderate	62	4	Often in tight flocks	4	16	High	HIGH	3B
Stock Dove	More than 200 days	Very High	255	8	Often in loose flocks	2	16	High	HIGH	5B
Teal	50 - 100 days	Moderate	305.5	8	Usually solitary or widely spaced	1	8	Moderate	MEDIUM	3C
Tufted Duck	More than 200 days	Very High	701.5	8	Usually solitary or widely spaced	1	8	Moderate	HIGH	5C

Step 1 Species occurring	Step 2A No. days per year species observed in zone under review	Step 2B Species occurrence rating	Step 3A Mean average mass (g)	Step 3B Body mass value	Step 3C Flocking characteristics	Step 3D Flocking value	Step 3E Severity value	Step 4A Species damage severity rating	Step 4B Species strike risk rating category	Step 4C Species strike risk rating sub-category
Wigeon	50 days	Low	771.5	8	Usually solitary or widely spaced	1	8	Moderate	LOW	2C
Wood-pigeon	More than 200 days	Very High	490	8	Often in loose flocks	2	16	High	HIGH	5B

10.3 Appendix C - Code of WHM practice for construction works (including enabling works)

10.3.1 Bird management strategy

All reasonable actions should be undertaken to manage enabling works to ensure the number of BSAC on site or in the critical flight zone for the airport does not escalate from the levels before project works started.

10.3.2 Hazards to be managed

There are features and activities during enabling works which will attract species of aviation concern. These attractions (hazards) need to be managed well in order to minimise the attraction for the species of aviation concern over and above the occurrence levels before enabling works started.

- **Groundworks**

Groundworks will provide a compelling attraction for increased numbers of bird species of aviation concern (BSAC) to the site. The attraction is for feeding, drinking and/or bathing.

This is because recently opened ground will expose invertebrates which are typically hidden from the BSAC. These are highly attractive sources of food for many BSAC. Any areas of grit can be attractive to pigeons as an aid for digestion. Excavated areas may experience pooling water and flooding which can both attract BSAC for bathing and drinking.

These hazards associated with groundworks should be considered during periods of (for example) archaeology, unexploded ordinance (UExO) and relocation of utilities.

- **Soil mounds**

Soil mounds are a high attraction for some BSAC from the when the mounds are being created. The attraction is for feeding and/or loafing.

Topsoil holds a rich source of food which will attract many BSAC when recently removed topsoil is added to a storage mound.

Mounds of any type of soil will offer an attractive elevated (safe) position for some BSAC which they will use for loafing. Some BSAC (e.g. pigeon) will also be attracted to theses mounds if they become vegetated by broad-leafed weeds.

- **Temporary attenuation ponds, basins and standing water**

Temporary attenuation ponds, basins and standing water will attract increased numbers of BSAC for drinking, bathing and/or feeding.

Regular use of construction machinery and vehicles can cause ground erosion which creates opportunities for pooling and standing water. Impermeable concave surfaces will also retain water during inclement weather.

Some BSAC will exploit pooling and standing water for drinking and bathing purposes. Insects trapped in the water will also attract the birds for feeding.

- **Construction of SUDS**

The construction of SUDS, either dry or wet, will involve a significant amount of groundworks. These groundworks will attract birds to the area for feeding opportunities where the topsoil has been removed.

- **Vermin, waste and litter**

Poor pest control, poor waste management and absence of regular litter picking will act as an attraction for increased numbers of BSAC seeking opportunities for feeding and nesting materials.

- Skips and waste bins on a site without appropriate lids or netting will be easily accessed by scavenging BSAC.
- Litter blown from the skips and waste bins will also serve as an attractant for BSAC
- Inappropriately discarded (dropped) food and waste materials anywhere across a site will attract scavenging BSAC. Vermin attracted by dropped food materials can, in turn, attract predatory BSAC.
- Unmanaged areas of soft landscaping can accumulate windblown and discarded litter which can act as an attractant for BSAC.

- Unwanted onsite social behaviour

The feeding of animals and birds on a site and the lack of complaince with good waste management is unwanted social behaviour because it will attract increased numbers of scavenging and predatory birds. Feeding by workers on a site and by visitors (planned or uninvited) to a site are examples of when this unwanted behaviour occurs.

- **Existing trees and soft landscaping**

Existing trees and soft landscaping, if left unmanaged during enabling works, can attract increased number of some BSAC for the purposes of feeding, nesting, loafing, staging and/or roosting.

The increase in canopy cover and growth of hedges can lead to increased levels of nesting, loafing, staging and/or roosting. Increased amounts of fruit and berries will attract higher numbers of BSAC for feeding.

If areas of the site are to be not developed for any period of time and unmanaged, they can quickly become overgrown with annual broadleaved weeds, grasses and flowering herbs such as dock, clover and bird's-foot trefoil. Seeds and broadleaf weeds can be attractive to some BSAC and also to small mammals (e.g. shrews, voles and mice) who will attract predatory BSAC.

- **Non-operational hours**

During times when there is no activity on a site, some BSAC will feel it is safer to scavenge for food and exploit opportunities to drink, loaf, stage and roost.

Good management of the site during non-operational hours is as important as during hours of operation.

10.3.3 Required WHM codes of practices during construction works (including enabling works)

The following practices should be observed to reduce the risks associated with the hazards identified above.

These practices should also be supported by (but not limited to) the Proposed Scheme’s Construction and Environmental Management Plan (CEMP),

Hydrology Strategy and the landscape management plan

The main contractor should use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

➢ **WHM practices for groundworks**

All strategic efforts must be taken to reduce the attractiveness of recently opened groundworks for increased numbers of BSAC.

This can be achieved through planned application of one or more of the following practices:

- Appropriate placement of bird deterrent systems for the prevailing weather conditions e.g. hawk kites and/or standalone, automatic bioacoustics **
- Minimised pooling and standing water.
- Drainage of temporary standing water within 48 hours
- Minimised exposed areas of grit

** Automatic bioacoustics and gas cannons must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife. They must also be utilised in a highly random pattern to avoid habituation of the birds.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

➢ **WHM practices for soil mounds**

All strategic efforts must be taken to reduce the attractiveness of soil mounds for increased numbers of BSAC.

This can be achieved through planned application of one or more of the following practices:

- Appropriate placement of bird deterrent systems for the prevailing weather conditions e.g. hawk kites and/or standalone, automatic bioacoustics **
- Minimised broad-leafed weeds – avoid the establishment of broad-leafed weeds during the construction and existence of the soil mounds.
- Seeding and maintenance of long term soil mounds to produce and retain a grass cover and sword that will reduce the ability of birds to forage in loose soil below and deter them from alighting on the mound.
- Minimised exposed areas of grit

** Automatic bioacoustics and gas cannons must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife. They must also be utilised in a highly random pattern to avoid habituation of the birds.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8 Appendix H – Tactical (Live) WHM Practice for Birds.

➢ **WHM practices for temporary attenuation ponds, basins and standing water**

All strategic efforts must be taken to reduce the attractiveness of temporary water filled features for increased numbers of BSAC.

This can be achieved through planned application of one or more of the following practices:

- Appropriate placement of bird deterrent systems for the prevailing weather conditions e.g. hawk kites and/or standalone, automatic bioacoustics **
- Installation of cover for open standing water clear of vegetation e.g. use of netting or shade balls.
- Minimised areas of pooling and standing water. Total water surface area of

all temporary attenuation ponds, basins and standing water, clear of vegetation or covers, should be as small as possible.

** Automatic bioacoustics and gas cannons must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife. They must also be utilised in a highly random pattern to avoid habituation of the birds.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

➢ **WHM practices for vermin, waste and litter**

All strategic efforts must be taken to reduce vermin, waste and litter attractions for increased numbers of BSAC.

This can be achieved through planned application of one or more of the following practices:

- All onsite skips, waste bins and waste bags must be in good condition, birdproof, covered with netting and/or stored in undercover waste compounds.
- All onsite skips and waste bins must be easily located and usable.
- Regular emptying of all skips and waste bins to avoid overfill is essential.
- Regular and prompt litter picking across the whole site, including in areas of soft vegetation.
- All waste storage and handling operations susceptible to windblown litter issues to be conducted inside a controlled area.
- A clean site policy to be enforced at all times.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

➢ **WHM practices against unwanted onsite social behaviour**

All strategic efforts must be taken to minimise unwanted onsite social behaviour.

This can be achieved through planned application of one or more of the following practices:

- A “no feeding of wildlife” policy to be enforced at all times. The policy should include no feeding of wild mammals or birds.
- Sufficient occurrence and distribution of onsite skips and waste bins to support good practice in waste disposal
- Clear and sufficient amount of signage to support prompt awareness of a “clean site” and “no feeding of wildlife” policy
- All contractors should use induction processes, toolbox talks and RAMS to minimise unwanted social behaviour.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

➢ **WHM practices for existing trees and soft landscaping**

All strategic efforts must be taken to reduce an increased attraction of existing trees and soft landscaping for BSAC.

This is best achieved through the application of the following Codes of WHM practice for existing as well as new trees and soft landscaping:

- Appendix D - Code of WHM Practice for Trees [see Section 6.4]
- Appendix F - Code of WHM Practice for Soft Landscaping [see Section 6.6]

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

- **WHM practices in the construction of SUDS**

All strategic efforts must be taken to reduce the attraction for BSAC when creating new SUDS.

This is best achieved through the application of the Codes of WHM practice for SUDS – See Section 6.5.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

- **WHM practices for non-operational hours**

All strategic efforts must be taken to reduce attractions for increased numbers of BSAC during non-operational hours for the site.

This can be achieved through planned application of one or more of the following practices:

- Appropriate placement of bird deterrent systems for the prevailing weather conditions e.g. hawk kites and/or standalone, automatic bioacoustics and gas cannons **
- Maintenance of security to avoid unplanned visitors to the site and associated unwanted social behaviour.

** Automatic bioacoustics and gas cannons must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife. They must also be utilised in a highly random pattern to avoid habituation of the birds.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred by strategic deterrent practice – See Section 6.8.

10.4 Appendix D - Code of WHM practice for trees

10.4.1 Bird Management Strategy

All reasonable actions should be undertaken to manage existing trees on the project site to ensure the number of BSAC on site or in the critical flight zone for the airport does not escalate from the levels before project works started.

10.4.2 Hazards to be managed

Existing trees can offer an array of attractions for birds of aviation concern.

- **Existing trees**

Existing trees if left unmanaged can attract increased numbers of BSAC to roost, stage and nest.

- **Green flyways**

Green flyways are formed when trees are planted close together causing the canopies to intermesh. This allows for birds to find safe passage across a site from one area to another.

- **Canopy density**

Dense tree canopies form areas within a site that are safe havens for bird species where they can roost, stage and nest away from predation and disturbance.

- **Stand of trees or copse**

Small trees planted in close proximity can form attractive copse or thickets for birds as they provide safe haven from predators and human activities.

10.4.3 Required WHM codes of practices for existing and new trees

The following practices should be observed during all stages of works on a site to reduce the risks associated with the hazards identified above.

These practices should also be supported (but not limited to) the Proposed Scheme's Construction and Environmental Management Plan (CEMP), Ecological Mitigation Strategy and Outline Bat Mitigation Strategy and the landscape and ecological management plan.

The main contractor should use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

➢ **WHM practices for existing and new trees**

When planning the retention of existing trees and new trees it is important to consider the age of existing trees and whether they have achieved full maturity and density, attractiveness of new trees for the BSAC and the distance of separation between existing and new trees in the planting plan.

It is an evidenced based proposal that balances the Proposed Scheme's need to achieve BNG targets and safeguard Norwich Airport.

Designs and retention plans must also abide by the Aerodrome Operators Association (AOA) advice note:

- Nut and berry-bearing species should be avoided to minimise the attractant for starlings and wood pigeons. However, such species may provide important resource for wildlife and, in places, are essential to the integrity of the proposed planting scheme. Low numbers of nut and berry bearing species may therefore be planted provided that they are dispersed amongst other non-nut and berry bearing species to reduce the total food supply for birds.

To minimise attractiveness for BSAC, all existing and new trees must have either naturally light, open canopies or be managed though processes and good practice to achieve and maintain light, open canopies.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred through good planning and management of the trees – See Section 6.8.

10.5 Appendix E - Code of WHM practice for SUDS

10.5.1 Bird management strategy

All reasonable actions should be undertaken in the design and management of Sustainable Urban Drainage Systems (SUDS) to ensure the number of BSAC on site or in the critical flight zone for the airport does not escalate from the levels before project works started.

10.5.2 Hazards to be managed

SUDS under construction or in used can offer an array of attractions for birds of aviation concern to feed, drink, loaf, nest and/or roost.

- **Construction of SUDS**

The construction of SUDS, either dry or wet, will involve a significant amount of groundworks. These groundworks will expose invertebrates which are typically hidden from the BSAC. These are highly attractive sources of food for many BSAC. Excavated areas may experience pooling water and flooding which can both attract BSAC for bathing and drinking.

- **SUDS in use**

There are a number of different types of SUDS, all of which can hold a level of attraction for BSAC due to one or more of the following reasons:

- Open water, present for 48 hours or more, can provide attraction to some BSAC for drinking, bathing, loafing and safe roosting out of reach of predators.
- Fish, reptiles and aquatic invertebrates existing in wet SUDS provide an attraction to some BSAC for feeding.
- Mammals existing around SUDS provide an attraction to some BSAC for feeding.
- Wetlands / damp soil around SUDS harbour invertebrates providing an attraction to some BSAC for feeding.

- Some species of vegetation found in and around SUDS (wet or dry) can provide food, staging, roosting and nesting resources for some BSAC.
- Unwanted social behaviour (e.g. feeding wildlife) can attract an increased number of BSAC.

10.5.3 Required WHM codes of practices for SUDS

There are a number of things which have been achieved in the design of the Proposed Scheme [6] to mitigate against increased numbers of the BSAC however there are aspects that remain to be managed during construction and in-use phases of the project.

The following practices should be observed when designing and constructing SUDS and when SUDS are in use, so as to reduce the residual risks associated with the hazards identified above.

These practices should also be supported by (but not limited to) the Proposed Scheme's Construction and Environmental Management Plan (CEMP), Ecological Mitigation Strategy and Outline Bat Mitigation Strategy, Hydrology Strategy and the landscape management plan

The main contractor should use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

➢ **WHM practices when designing SUDS and for management of SUDS in use**

All strategic efforts must be taken to reduce the attractiveness of SUDS for increased numbers of BSAC.

The layout and habitat in and around SUDS must be well planned and manageable (where applicable). This can be achieved through planned application of one or more of the following practices:

[6] Proposed Scheme planning application documents: 4.05.04 and 4.05.06

- Planting (vegetative cover) in open water aquatic beds, emergent wetlands and wetlands in and around SUDS should be selected on the basis of not providing attractive feeding, nesting, roosting, loafing or staging resources for the BSAC.
- There should be minimised areas of open water in SUDS. Total water surface area, clear of emergent vegetative cover, should be as small as possible.
- Linear layout of SUDS should be avoided as much as possible to minimise favourable flight in and out routes for waterfowl.
- Filter Trenches should be designed to support efficient filtration and easy maintenance to clear any blockages to avoid ponding.
- There should be no islands within a SUDS. Neither gravel nor grassed.
- Fencing or knee rails should be installed around SUDS to minimise larger BSAC (e.g. geese) from accessing and exiting SUDS.
- Banks on ponds should be as steep as possible to minimise larger BSAC (e.g. geese) from walking in and out of the SUDS
- Maintenance of soft landscaping around SUDS should comply with the WHM Practice for Soft Landscaping - see Section 6.6
- Drainage downtime in SUDS should be continuous and efficient, with open areas of water draining down within 48 hours.
- SUDS outlet pipes and channels should be designed to minimise build-up of vegetive debris and waste materials
- SUDS outlet pipes and channels must be kept clear of obstructions to minimise hindrance of drainage downtime.
- Signage around SUDS must be installed widely and be easily visible to discourage people from feeding wildlife.

Tactical (live) reactive bird control techniques should also be applied if the BSAC are not sufficiently deterred from SUDS by strategic deterrent practice – See Section 6.8. Appendix H – Tactical (Live) WHM Practice for Birds.

- **WHM practices for the construction of SUDS**

All strategic efforts must be taken to reduce the attractiveness of groundworks for increased numbers of BSAC when constructing SUDS.

To achieve this all the required WHM practices during construction works should be followed during the construction of SUDS – see Section 6.3.

10.6 Appendix F - Code of WHM practice for soft landscaping

10.6.1 Bird Management Strategy

All reasonable actions should be undertaken in the design and management of soft landscaping to ensure the number of BSAC on site or in the critical flight zone for the airport does not escalate from the levels before project works started.

10.6.2 Hazards to be managed

Soft landscaping can offer an array of opportunities for birds to feed, nest, loaf and roost.

- **Short grass**

Short grass swards can be highly attractive to some BSAC (e.g. gull and corvid species) to feed on invertebrate coming up to the surface, especially so when the soil becomes wet or waterlogged.

- **Long grass**

Long grass swards provide an ideal environment for insects and invertebrates which, in turn, provides an attractive food source for some BSAC (e.g. corvids)

Taller grasses provide shaded areas of ground, ideal for broad-leafed weeds that are a staple food for some BSAC (e.g. pigeons).

- **Meadow grass**

Meadow grasslands include nectar-rich plants which attract hoverflies, butterflies, moths, and bees. The habitat will also be more likely to support small mammals and even reptiles. All these can attract predatory BSAC (e.g. buzzards).

- **Growing and reinstating grass**

When growing or reinstating grass, care will be taken to minimise water logging and standing water, and to also minimise the propagation of weeds whilst there are bare areas of soil to avoid attracting in some BSAC for feeding, bathing and drinking.

- **Shrubs, bushes and hedges**

Fruit, nut and berry bearing shrubs, bushes and hedges provide a wealth of food for various BSAC.

Dense cover within shrubs, bushes and hedges can also provide attractive safe roosting and nesting locations for some BSAC.

- **Broad-leafed weeds**

Broad-leafed weeds, such as clover, provide feeding attractions for some BSAC to gather to forage, feed and loaf (e.g. pigeons).

10.6.3 Required WHM codes of practices for Soft Landscaping

In reference to the design risk assessment for the Proposed Scheme [7], there are a number of things which have been achieved in the design to mitigate against an increased numbers of the BSAC however there are aspects that remained to be managed during construction and in-use phases of the project.

The following practices should therefore be observed for soft landscaping so as to reduce the residual risks associated with the hazards identified above.

These practices should also be supported by (but not limited to) the Proposed Scheme's Construction and Environmental Management Plan (CEMP), Ecological Mitigation Strategy and Outline Bat Mitigation Strategy, Hydrology Strategy and the landscape and environmental management plan

The main contractor should use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

- **WHM practices for short grass**

All strategic efforts must be taken to reduce the attractiveness of short grass for increased numbers of BSAC:

[7] Proposed Scheme planning application documents: 4.05.04 and 4.05.06

- Monitoring of grass condition will be undertaken on a regular basis to avoid above ientified hazards taking hold.
- All grass arisings should be removed at the time of cutting to maintain a good sward.
- Ensure any existing drainage systems are maintained and prevented from becoming blocked to reduce opportunities for waterlogging and standing water.
- Areas that repeatedly stay waterlogged and have standing water are to be drained as quickly as possible so as not to attract gulls for bathing and foraging.
- Use of growth regulators can be permissible where indicated by a habitat management specialist to stunt the vertical growth of a sward yet promote lateral growth, thereby strengthening the base of the sward. The use of growth regulators is most appropriate on any short grass areas prone to becoming weak and open to exploitation by foraging birds.

➢ **WHM practices for long grass**

All strategic efforts must be taken to reduce the attractiveness of long grass for increased numbers of BSAC:

- Long grass should be kept free of broad-leafed weeds.
- Large expanses of long grass should be periodically bottomed-out to remove decaying grass cuttings to maintain a good sward. Bottoming out should be down to between 30-40 mm from ground level depending on the contours of the soil surface Bottoming out should also take place in early spring when bird activity is at its lowest and as soon as ground conditions are sufficiently stable to allow the ingress of heavy machinery. The procedure will then be completed in time for the sward to reach the optimum sward height.
- Ensure any drainage systems are maintained and prevented from becoming blocked to reduce opportunities for waterlogging and standing water.

- Areas that repeatedly stay waterlogged and have standing water are to be drained as quickly as possible so as not to attract gulls for bathing and foraging.

➢ **WHM practices for meadow grass**

All strategic efforts must be taken to reduce the attractiveness of long grass for increased numbers of BSAC:

- First cut should be to 150mm in March/April, then as necessary to promote good meadow cover and control weed growth (or in accordance with the specific mix composition as recommended by suppliers)
- Regular checks for invasive species that attract birds and removal by hand or spot weed treatment
- Scarify and re-seed any areas where cover is poor to deter birds from foraging in the bare ground
- Hay can be left to dry for 3 – 5 days before being removed to avoid rotting down and creation of a microhabitat attractive to some BSAC.
- Ensure any existing drainage systems are maintained and prevented from becoming blocked to reduce opportunities for waterlogging and standing water.
- Areas that do repeatedly stay waterlogged and have standing water are to be drained as quickly as possible so as not to attract birds for bathing and foraging.

➢ **WHM practices for growing and reinstating grass**

All strategic efforts must be taken to reduce the attractiveness of new grass for increased numbers of BSAC:

- Maximise free draining grassed areas and remove weeds as soon as they are noted as becoming established.
- Select appropriate time of year to maximise vigorous growth
- Ensure no bare areas will be left to deter birds from foraging in the bare ground

➢ **WHM practices for shrubs, bushes and hedges**

All strategic efforts must be taken to reduce the attractiveness of shrubs, bushes and hedges for increased numbers of BSAC:

Increased ratios of berry-bearing species should be avoided to minimise the attractant for starlings and wood pigeons. However, such species provide an important resource for wildlife and, in places, are essential to the integrity of the proposed planting scheme;

- Low numbers of berry bearing plants can be planted provided that they are dispersed amongst other non-berry species to reduce the total food supply for birds.
- Dense thickets must be avoided.
- A regular maintenance program must be in place to seasonally manage the growth.

➢ **WHM practices for broad-leafed weeds**

All strategic efforts must be taken to reduce the attractiveness of broad-leafed weeds for increased numbers of BSAC:

- Maximise free draining grassed areas
- All grassed areas are to be maintained to at least 95% broad-leafed weed free.
- A programme of herbicide/manual control (cutting or removal) should be implemented as often as required to control weed infestations.

10.7 Appendix G - Code of WHM practice for planned structures

10.7.1 Bird Management Strategy

All reasonable actions should be undertaken in the design and management of planned NWL structures to ensure the number of BSAC on site or in the critical flight zone for the airport does not escalate from the levels before project works started.

10.7.2 Hazards to be managed

The planned Proposed Scheme structures would offer an array of opportunities for birds to colonise undercrofts and access spaces for breeding, loafing, and roosting. Birds such as Feral pigeons will utilise any accessible, sheltered space (e.g. ledges) and will quickly form large colonies which could then escalate the risk of strike risks for aircraft.

- **Ledges**

Any sheltered ledges within a structure, including column shoulders, providing protection from wind and rain, are ideal for the likes of Feral pigeons to breed, loaf, and roost overnight prior to flocking out after first light to forage.

- **Voids**

Spaces or cavities anywhere within a structure (i.e. voids) are ideally suited to the nesting preferences of Feral pigeons. These birds originate from cliff dwelling species and, in urbanised areas, seek out voids in structures that replicate crevasses in cliffs.

10.7.3 Required WHM codes of practices for planned Proposed Scheme structures

There are a number of things which have been achieved in the design of the Proposed Scheme[8] to mitigate against increased numbers of the BSAC however there are aspects that remain to be managed during construction and in-use

[8] Proposed Scheme planning application documents: 4.05.04 and 4.05.06

phases of the project. The following practices should therefore be observed for planned NWL structures so as to reduce the residual risks associated with the hazards identified above at the time of its construction and anytime in the future.

These practices should also be supported by (but not limited to) the Proposed Scheme's Construction and Environmental Management Plan (CEMP), Ecological Mitigation Strategy and Outline Bat Mitigation Strategy, Hydrology Strategy and the landscape management plan

The main responsible of the project construction and its further maintenance should use induction processes, toolbox talks and RAMS to ensure full and continuous adoption of required WHM practices by subcontractors.

➢ **WHM practices for ledges and voids**

All strategic efforts must be taken to reduce the attractiveness of ledges for increased numbers of BSAC:

- In the first instance, it has been agreed that the design submitted in the formal wildlife hazard design risk assessment is acceptable with the following condition which could apply in a future scenario:
    - Bird proofing must be applied to the planned Proposed Scheme structures in the event the Airport assesses an escalation in Feral pigeon strike risk for aircraft as a direct result of increased numbers of Feral pigeon utilising the planned Proposed Scheme structures. The likelihood for this scenario to happen is **very low** as mentioned in the WHRA [9] as Feral pigeon population has been found mainly associated to the urban developments and Norwich City Centre, meaning that no bird proofing measures are expected to be needed until the urban development reaches the surroundings of the Proposed Scheme.
- The options for bird proofing could include stainless steel mesh or spikes however bird proofing options should be reviewed at the time of the assessed

[9] Proposed Scheme planning application document: 4.05.04

escalation. This is because the best techniques to deter pigeons will change over the course of time with the development of better and cheaper techniques and solutions.

10.8 Appendix H – Tactical (Live) WHM practice for birds

Being speculative by nature, even with implementation of strategic (planned) measures of bird control, birds will still occur on a project site. Their frequency though will be significantly less than it would have been without strategic (planned) measures of control. This being the case one or more deterring techniques must be available to reactively harass, disperse and deter unwanted BSAC from the site.

10.8.1 Role and Responsibilities

Wildlife controllers and/or deterrent activities should be employed across the whole project site for aspects identified in the required codes of practice in Appendix C – G.

All activities must be appropriately licensed and equipped and all personnel must be suitably qualified and experienced to provide the required range of active controls across the site area for as many hours as required to reduce the occurrence of BSAC on the site to at least agreed tolerance levels.

In the case of a wildlife strike requiring investigation by the Air Accident Investigation AAIB or the UK CAA, active monitoring and recording is advisable, with proactive patrols to detect and deter BSAC. This will put the Proposed Scheme in a robust position to evidence all reasonable and practicable precautions had been undertaken and to minimise liability for the Applicant.

10.8.2 Active (Live) BSAC deterrent techniques

The principal active (live) BSAC deterrent techniques are as follows (in order of priority of application) and should only be applied in accordance with all applicable legislation [10]:

- Visual and audible disturbance by humans
- Bioacoustics and audible scares

[10] In particular (but not limited to) the Wildlife and Countryside Act 1981 as amended.

- Necessary removal of eggs from nests
- Depredation

Industry good practice and training in the use of appropriate wildlife deterrent equipment will mitigate the likelihood of BSAC.

Deterrent equipment must only be used following appropriate risk assessments and consultation with the Airport, local authorities, neighbouring sites and wildlife control specialists. Consultation with these stakeholders must be carried out beforehand and not when wildlife management is needed to allow for immediate or timely control of the wildlife.

Depredation is a last resort technique to be used when the BSAC do not respond to all other control methods. All depredation actions on the Proposed Scheme must be in accordance with statutory regulations and licencing requirements e.g. the Natural England “Licence to Kill or Take certain Birds to preserve air safety”.

Any use of trained predators such as birds of prey/falcons must only be carried out by wildlife control specialists with prior experience in using these methods.

Before removing, altering or interfering with bird nests, it must be determined whether or not the disturbance is legal in accordance with the UK Wildlife and Countryside Act 1981 (as amended). In the UK, guidance indicates that most birds nest between 01 March and 31 July. However, birds can be nesting outside this period, therefore advised checks are always undertaken to ensure that there are no nests present before any pruning and grass cutting.

In the instance of an unforeseen gathering of BSAC:

- Employ wildlife dispersal techniques to discourage observed species from entering the site.
- Recheck the site for unforeseen attractants for BSAC and undertake actions that will remove these attractions e.g. clear up rubbish, empty bins and check for seeding weeds or clover.

Reschedule management plans to ensure successful mitigation of previously unforeseen attraction for BSAC.

10.9 Appendix I – Recommended Key Performance Indicators (KPI)

The following are recommended Key Performance Indicators (KPI) that should be in place to support good practice in wildlife hazard management on the Project site and to ensure no escalation in the BSAC.

The KPI targets should be agreed between the Airport and the main Contractor as the responsibility of a determined KPI can fall on the Site Manager of any of them prior to the start of any work or activity on site, regularly reviewed thereafter and no less than annually.

KEY: TBA = To Be Agreed.

Section	Activity	Key Performance Indicators	Target Performance
Data Collection	Official WHM Logbook	The Site Manager to complete the Official WHM Logbook with all required information by the end of each working day.	TBA
Risk Assessment	Wildlife Hazard Risk Assessments	The Site Manager to be aware of the latest Wildlife Hazard Risk Assessment from the Airport. This should be available from the Airport on a quarterly basis or within 1 week of a reported relevant bird strike (whichever is the sooner).	TBA
Risk Assessment	Wildlife Hazard Risk Assessments	The Site Manager to ensure the WHMP and associated action plans are updated within 1 week of a revised WHM Risk Assessment from the Airport to ensure optimised bird hazard risk mitigation.	TBA

Section	Activity	Key Performance Indicators	Target Performance
Planning	Planned and Reactive WHM mitigation plans	The Site Manager to ensure there is a robust programme of planned and reactive WHM mitigation actions in place to support requirements in this WHMP.	TBA
Planning	Site Management Policies	The Site Manager to ensure there is always a “Clean Site” policy in place that supports requirements in this WHMP.	TBA
Planning	Key Contact Details	Key contact details for Airport wildlife hazard management must be permanently on display at the designated location on-site.	TBA
Delivery	Planned and Reactive WHM mitigation plans	The Site Manager to deliver planned and reactive WHM mitigation actions as required within this WHMP, to comply with current and future statutory regulations, and in accordance with WHM industry SARP. The Site Manager to carry our any additional WHM activities and this WHMP adjusted accordingly at the reasonable request of the Airport, should a bird strike issue directly related to the site be identified.	TBA

Section	Activity	Key Performance Indicators	Target Performance
Delivery	Site Cleanliness	The Site Manager to ensure that all site bins have bird proof lids, and all open skips are netted or covered, to avoid becoming an added attraction for birds and vermin	TBA
Delivery	Site Cleanliness continued	The Site Manager to ensure that all site bins and skips are emptied frequently enough to avoid overflowing and becoming an added attraction for birds and vermin. The Site Manager to ensure pest and vermin control is undertaken to minimise their presence on site	TBA
Delivery	Quality Assurance	The Site Manager to deliver all planned and reactive WHM mitigation actions to agreed quality standards in this WHMP.	TBA
Delivery	Health and Safety	The Site Manager to undertake all WHM duties and use of associated equipment in accordance with all statutory legislation	TBA

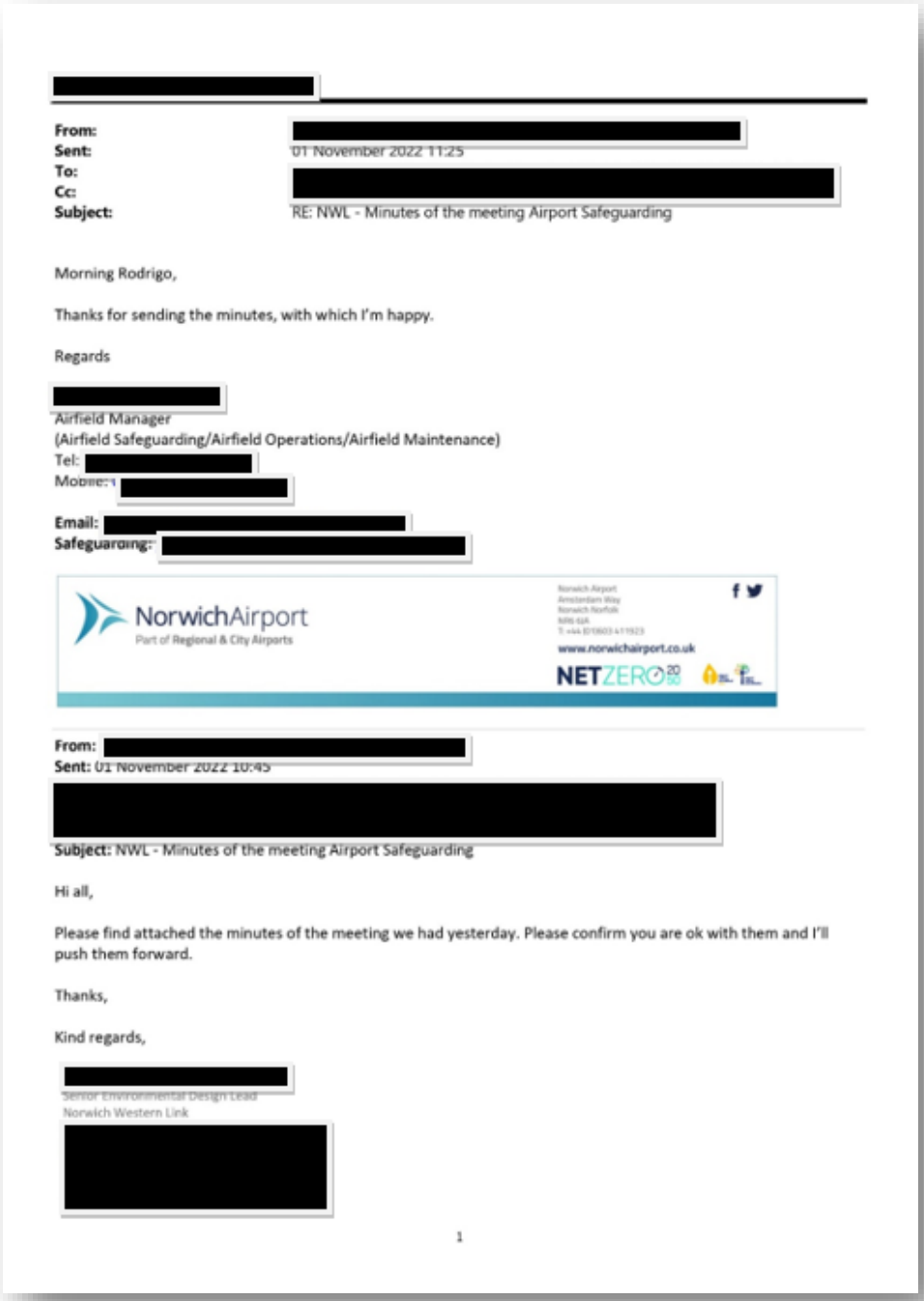
Section	Activity	Key Performance Indicators	Target Performance
Monitoring	Bird Observations	Throughout all phases, the Site Manager should record in a daily logbook the following: • When BSAC monitoring undertaken • Who undertook BSAC monitoring • Date, time and locations • Weather conditions • Bird numbers and species seen across the site • Assessed new or increased wildlife hazard related risks • Details of any deterrent and dispersal actions taken, and numbers of any eggs / nests removed under licence. • The adjustments in the management programmes to avoid (as far as possible) a repeat of observed new or increased bird related issues and risk	TBA
Monitoring	Monitoring Inspections	During enabling and construction phases, visual monitoring be undertaken throughout the days of site operation with records made in an official logbook	TBA

Section	Activity	Key Performance Indicators	Target Performance
Feedback & Learning	Meeting Attendance	The Contractor shall provide an appropriate level of seniority at all required meetings.	TBA
Feedback & Learning	Review Meetings for all new enabling and construction works	The Contractor is to arrange and participate in review meetings (face-to-face or virtual) with the Airport once per month for the first six months, starting one month ahead of start of these works. Then, bi-monthly thereafter or unless agreed differently with the Airport.	TBA
Feedback & Learning	Review Meetings throughout all operational phase	The contractor is to arrange and participate in periodic however regular meetings with the Airport to review WHM performance and compliance. The frequency of meetings must be determined by the Airport and no less than once per year.	TBA
Feedback & Learning	This WHMP, and all mitigation action plans	This WHMP, and all mitigation action plans must be reviewed against the official logbook and updated accordingly on (at minimum) an annual basis, in response to WHM feedback from the Airport and in response to a change in key activities on site.	TBA

Section	Activity	Key Performance Indicators	Target Performance
Feedback & Learning	This WHMP, and all mitigation action plans	A schedule of changes made in this WHMP, and all mitigation action plans must be maintained for future reference as and when required.	TBA
Feedback & Learning	Training	All personnel working on site must be inducted on the importance of WHM and minimisation of factors that could contribute towards elevated Wildlife hazard risks for the Airport. Training records must be available for inspection without prior arrangement.	TBA
Feedback & Learning	Documentation response times	The official logbook, WHMP, and all mitigation action plans must always be available on request for review by (at least) the Airport, a LPA or UK CAA.	TBA
Feedback & Learning	Quality Assurance	The WHMP (the strategy, action plan and required policies) and its KPI must be mutually reviewed at least annually or following any reported potentially related bird strike or near miss for aircraft using the Airport, whichever is sooner.	TBA

10.10 Appendix J – Agreements with Norwich Airport

On November 2022 the following agreement was made between the Applicant and Norwich Airport in respect of the approach to feral pigeons (item 1.1 below):



[redacted]

From: [redacted]
Sent: 01 November 2022 11:25
To: [redacted]
Cc:
Subject: RE: NWL - Minutes of the meeting Airport Safeguarding

Morning Rodrigo,

Thanks for sending the minutes, with which I'm happy.

Regards

[redacted]
Airfield Manager
(Airfield Safeguarding/Airfield Operations/Airfield Maintenance)
Tel: [redacted]
Mobile: [redacted]
Email: [redacted]
Safeguarding: [redacted]

NorwichAirport
Part of Regional & City Airports

Norwich Airport
Amsterdam Way
Norwich Norfolk
NR6 6JA
T: +44 (0)1603 411923
www.norwichairport.co.uk

NETZERO 2040

From: [redacted]
Sent: 01 November 2022 10:45
[redacted]
Subject: NWL - Minutes of the meeting Airport Safeguarding

Hi all,

Please find attached the minutes of the meeting we had yesterday. Please confirm you are ok with them and I'll push them forward.

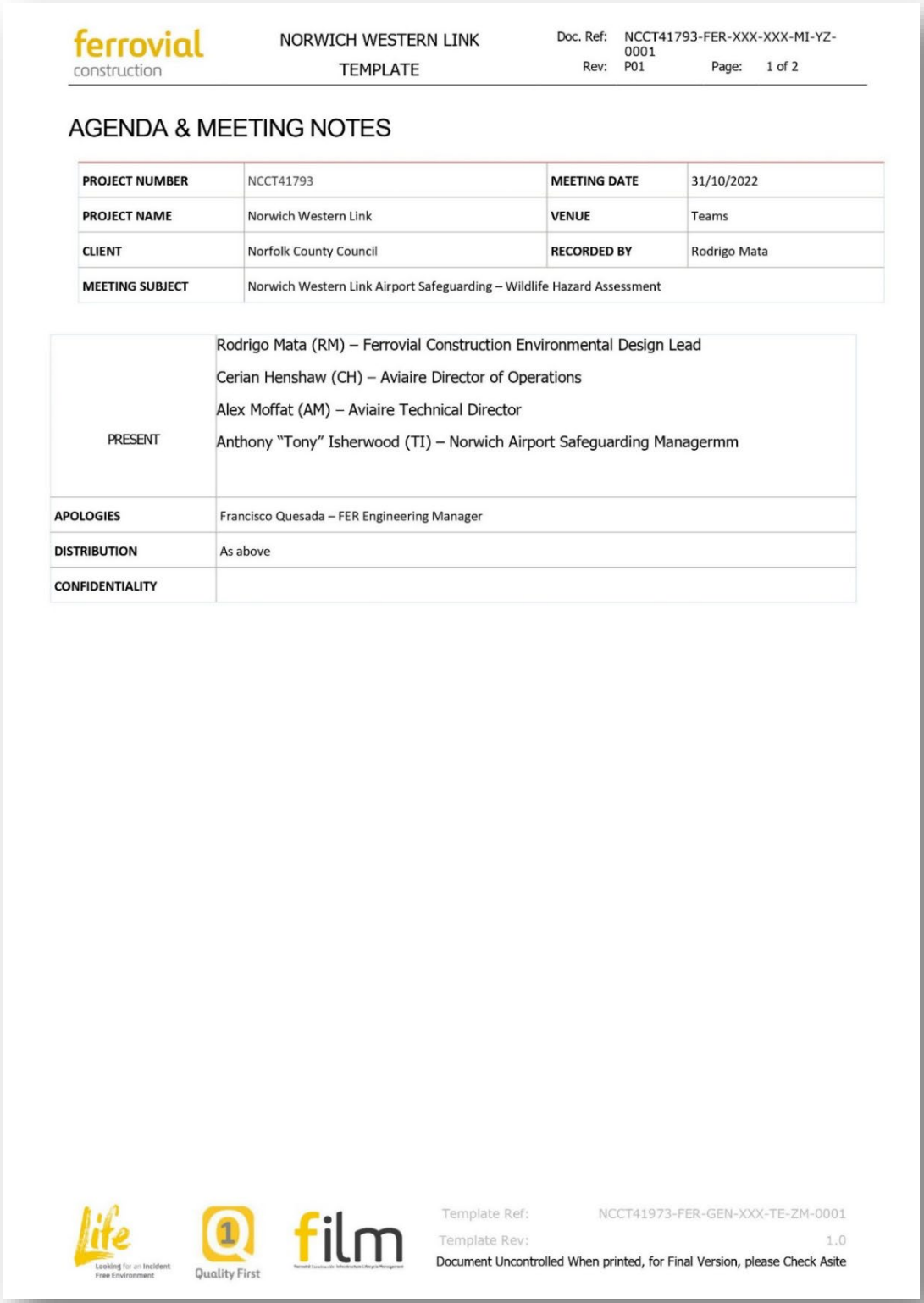
Thanks,

Kind regards,

[redacted]
Senior Environmental Design Lead
Norwich Western Link
[redacted]

1

Figure 8: Copy of email confirming approval between the Applicant and Norwich Airport for minutes of meeting in October 2022



ferrovial construction

NORWICH WESTERN LINK
TEMPLATE

Doc. Ref: NCCT41793-FER-XXX-XXX-MI-YZ-0001
Rev: P01 Page: 1 of 2

AGENDA & MEETING NOTES

PROJECT NUMBER	NCCT41793	**MEETING DATE**	31/10/2022
PROJECT NAME	Norwich Western Link	**VENUE**	Teams
CLIENT	Norfolk County Council	**RECORDED BY**	Rodrigo Mata
MEETING SUBJECT	Norwich Western Link Airport Safeguarding – Wildlife Hazard Assessment		

PRESENT	Rodrigo Mata (RM) – Ferrovial Construction Environmental Design Lead Cerian Henshaw (CH) – Aviaire Director of Operations Alex Moffat (AM) – Aviaire Technical Director Anthony "Tony" Isherwood (TI) – Norwich Airport Safeguarding Managermm
APOLOGIES	Francisco Quesada – FER Engineering Manager
DISTRIBUTION	As above
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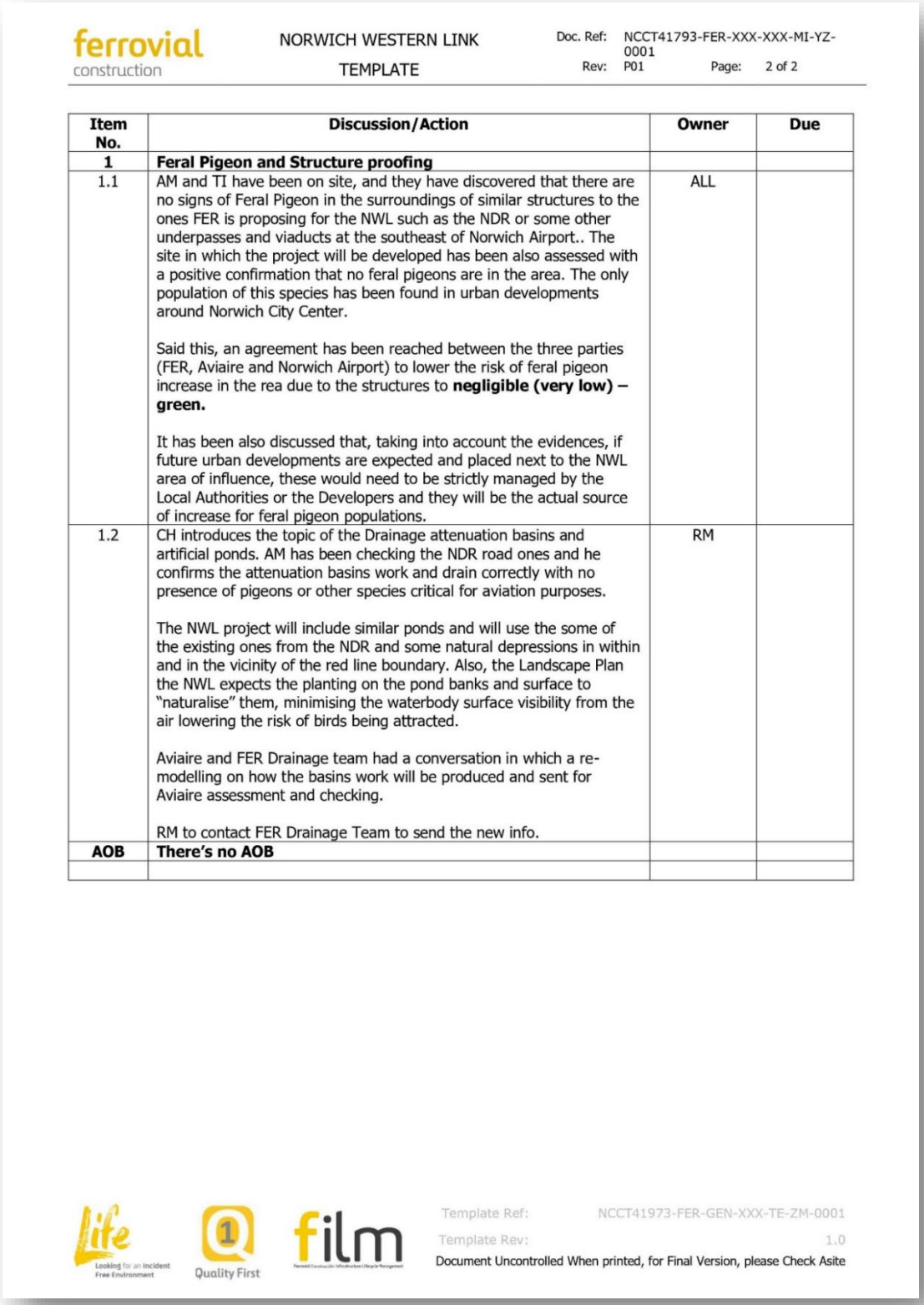
Figure 9: Minutes of meeting between Applicant and Norwich Airport in Oct 22 (Page 1).



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Item No.	Discussion/Action	Owner	Due
1	**Feral Pigeon and Structure proofing**		
1.1	AM and TI have been on site, and they have discovered that there are no signs of Feral Pigeon in the surroundings of similar structures to the ones FER is proposing for the NWL such as the NDR or some other underpasses and viaducts at the southeast of Norwich Airport.. The site in which the project will be developed has been also assessed with a positive confirmation that no feral pigeons are in the area. The only population of this species has been found in urban developments around Norwich City Center. Said this, an agreement has been reached between the three parties (FER, Aviaire and Norwich Airport) to lower the risk of feral pigeon increase in the rea due to the structures to **negligible (very low) – green.** It has been also discussed that, taking into account the evidences, if future urban developments are expected and placed next to the NWL area of influence, these would need to be strictly managed by the Local Authorities or the Developers and they will be the actual source of increase for feral pigeon populations.	ALL	
1.2	CH introduces the topic of the Drainage attenuation basins and artificial ponds. AM has been checking the NDR road ones and he confirms the attenuation basins work and drain correctly with no presence of pigeons or other species critical for aviation purposes. The NWL project will include similar ponds and will use the some of the existing ones from the NDR and some natural depressions in within and in the vicinity of the red line boundary. Also, the Landscape Plan the NWL expects the planting on the pond banks and surface to "naturalise" them, minimising the waterbody surface visibility from the air lowering the risk of birds being attracted. Aviaire and FER Drainage team had a conversation in which a re-modelling on how the basins work will be produced and sent for Aviaire assessment and checking. RM to contact FER Drainage Team to send the new info.	RM	
AOB	**There's no AOB**		

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Figure 10: Minutes of meeting between Applicant and Norwich Airport in Oct 22

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