ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME 2 - Appendices

GRANGE CASTLE MEDIA PARK

TOM PHILLIPS + ASSOCIATES
PLANNING FOR THE FUTURE

APRIL 2024

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Appendix 1.1

CUMULATIVE PROJECTS LIST

Reg. Ref	Address	Decision	Description
SD23A/0331	Grange Castle Business Park West, Milltown, and Loughtown Upper Townlands, New Nangor Road, Clondalkin, Dublin 22	Decision Date: 21/02/2024 Decision: Additional Information Required	10-year permission for development for a Filling & Packaging Facility for medicines with a total area of approximately 147,192 square metres and infrastructure required to support the proposed development including: (a) 3 no. 3-level filling buildings, each sized approximately 10,637 square metres and approximately 22.1 metres high, with roof-mounted plant and equipment and solar panels. (b) A 2-level warehouse building with high-bay automatic storage and retrieval system (ASRS) area, sized approximately 18,655 square metres and approximately 33.7 meters high, with roof-mounted plant and equipment and solar panels. (c) 2 no. 3-level assembly and packaging buildings, one sized approximately 24,975 square metres and approximately 17.9 meters high, and one sized approximately 24,175 square metres and approximately 17.9 meters high both with roof-mounted plant and equipment and solar panels. (d) A 5-level administration building sized approximately 20,613 square metres and approximately 28.5 metres high with roof-mounted plant and equipment and solar panels. (e) A 4-level laboratory building sized approximately 4,733 square metres and approximately 21.8 metres high and roof-mounted plant and equipment and solar panels. (f) A 2-level pedestrian and materials spine building sized approximately 10,815 square metres and approximately 15.5 metres high, with roof mounted plant and equipment including louvred screen. (g) A 2-level Central Utilities Building (CUB) building sized approximately 9,312 square metres and approximately 17.7 metres, with roof-mounted plant and equipment including louvred screen. (h) A 2-level pedestrian and materials link area sized approximately 502 square metres and approximately 15.5 metres high with roof-mounted plant and equipment. (i) A single storey bicycle shelter and cyclist

			shower/changing facility building located to the west of the administration building, sized approximately 440 square metres and approximately 4 metres high. (j) A single storey fire water pumphouse sized approximately 75 square metres and approximately 6 metres high. (k) A single storey water pumphouse sized approximately 200 square metres and approximately 6 metres high. (l) A chemical store sized approximately 120 metres and approximately 6 metres high located in the yard adjacent to the proposed Central Utilities Building (CUB). (m) A proposed car park including approximately 551 car parking spaces, including accessible car parking spaces, electric vehicle charging, motorcycle parking, dedicated car-pooling spaces, all accessed from the internal Grange Castle West Business Park roads. (n) 2 no. single-storey security buildings one sized approximately 30 square metres and approximately 3.7 metres high and one sized approximately 91 square metres and approximately 3.7 metres high. (o) The proposed site infrastructure includes cooling towers/heat exchangers, a tank farm, pipe-bridges, surface water harvest tanks, docks and yard areas, including associated items of plant and equipment, an electric vehicle charging and solar panel substation to service photovoltaic panels over new car parking spaces sized approximately 50 square metres and approximately 6 metres high, 2 no. smart shelters to accommodate plant and equipment, associated works for re-routing of the existing ESB overhead wires which traverse the site to underground cables within the site, storage structures and modular control units and underground pumping facilities and internal roads and paths, fencing and site lighting. (p) the development includes an additional heavy goods vehicle entrance from the internal Grange Castle West Business Park road to the northeast corner of the proposed campus, including modifications to the existing road and

			footpaths. (q) Proposed new landscaping includes new landscaped and planted areas, landscaped berms, ponds, swales and surface water attenuation features, perimeter security fencing and gates. (r) Proposed new signage based at ground level and on the building facades on the proposed new buildings. (s) The works include temporary contractor compounds including temporary cabins, temporary car parking and the temporary use of existing site entrances during construction activities. (t) Proposed new surface water management infrastructure of the site, consisting of underground and surface attenuation systems, rainwater harvest cisterns and distribution pipework and the diversion and modifications to the existing public foul sewer pipelines, including the relocation of an existing macerator. (u) The re-routing of the existing watercourse to the northeast corner of the site to include additional biodiversity features. (v) The construction of a new 38kVA electrical substation compound including 3 no. buildings, one sized approximately 135 square metres and approximately 6 metres high, one sized approximately 310 square metres and approximately 6 metres high and one sized approximately 50 square metres and approximately 6 metres high and a compound to accommodate 5 no. electrical generators and associated fuel tanks and electrical transformers with dedicated vehicular access from the public road to the northwest corner of the site (w) all associated site works including sustainability features described herein. An Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) accompany this planning application.
SD23A/0320	Pfizer Ireland Pharmaceuticals, Grange Castle Busniess Park,	Decision Date: 06/02/2024	Additions, alterations, and modifications to the existing and permitted industrial facilities, with a total area of approximately 305.8 sqm (permitted under Reg Ref SD23A/0123) at the

	Nangor Road, Clondalkin, Dublin 22	Decision: GRANTED Final Grant Date: 15/03/2024	Pfizer site in Grange Castle. They include; A. a single storey extension to the link building adjacent to the DS2 building permitted under Reg Ref SD23A/0123. The proposed extension is approximately 240 sqm and approximately 7.9 meters high. B. Demolition of existing single-storey extension approximately 36 sqm and approximately 4.2 meters high and construction of a new single storey extension to the existing Softened Water Building. The proposed extension is approximately 65.8 sqm and approximately 7.2 meters high. C. The works also include modifications to internal roads and pathways, underground utilities, site lighting, internal roads and footpaths and all associated site works. This application consists of a variation to previously permitted development for an activity for which a licence under Part IV of the Environmental Protection Agency Act 1992 (as amended by the Protection of the Environment Act, 2003) is required.
SD23A/0301	Gollierstown and Milltown, (west of Grange Castle Business Park & The Adamstown Road (R120), Newcastle, Dublin	Decision Date: 15/01/24 Decision: GRANTED Final Grant Date: 01/03/24	The construction of five logistics / warehousing units (Units 1 - 5) with associated office accommodation, service yards, ancillary structures/areas, and substations. The overall floor area of the proposed logistics / warehousing units is c. 56,932 sq. (Gross Internal Area (GIA)) with a total of c. 4,336 sq. of office space. See following breakdown of each unit: Unit 1 will comprise GIA c. 10,432 sq. (including c. 579 sq. of associated office space) and measures c. 17.9m from finished floor level (FFL) to roof ridge; Unit 2 will comprise GIA c. 18,065 sq. (including c. 1,005 sq. of associated office space) and measures c. 18.4m from FFL to roof ridge; Unit 3 will comprise GIA c. 6,325 sq. (including c. 579 sq. of associated office space) and measure c. 17.4m from FFL to roof ridge; Unit 4 will comprise GIA c. 8,762 sq. (including c. 484 sq. of associated office space) and measures c. 17.6m from FFL to roof ridge; Unit 5 will comprise GIA c. 13,348

			sq. (including c. 1,689 sqm of associated office space) and measures c. 17.8m from FFL to roof ridge; Access to the site will be from the existing roundabout to the south of the site; Provision of no. 419 car parking spaces and 172 bicycle spaces to serve the proposed development; Associated works for the diversion of the existing foul sewer within the site; The provision of attenuation basins / wetlands across the site; Associated works for re-routing of the existing ESB overhead wires which traverse the site to underground cables within the site; The formation of plateaus on the site with surplus excavated material to allow for the future Phase 2 development and; All ancillary landscaping, boundary treatments, internal roads and roundabout, cycle / pedestrian paths, associated infrastructure, and site development works to support the development
SD23A/0012	Milltown, located to the north of Peamount Road (R120) & Peamount Lane, Newcastle, Co. Dublin	Decision Date: 08/08/2023 Decision: GRANTED Final Grant Date: 19/09/2023	Construction of a new Battery Energy System Storage (BESS) and Power Trunk building and all associated elements; Demolition of all existing structures on site associated with the current golf centre - including main clubhouse and a number of ancillary structures (total 1,009.84sq.m); Construction of a two storey power trunk building (maximum height 10.3m) over basement of 1,982.61sq.m containing MV switchgear; Construction of a BESS to reach a total capacity of 186.3 MWe; The facility will be within an open three storey structure (maximum height of 17.3m), totalling 18,560.9sq.m in area, containing 63 battery containers, & 63 no containers containing power invertors, step up transformers and electrical switchgear and roof level array of 1384 PV panels; 1 two storey administrative welfare buildings (298.26sq.m) associated with the BESS facility.

SDZ23A/0011	Unit 3, Sentinel Building, Station Road, Adamstown, Co. Dublin	Decision Date: 07/07/2023 Decision: GRANTED Final Grant Date: 07/07/2023	Change of use of unit 3 (566qm) from Class 1 (retail) to Class 9 (Residential Training Centre) and associated signage and ancillary works. The development will take place within Adamstown Strategic Development Zone.
SD23A/0123	Grange Castle Business Park, New Nangor Road,Clondalkin, Dublin 22	Decision Date: 17/07/2023 Decision: GRANTED Final Grant Date: 25/08/2023	Permission for development consisting of the completion of the development granted permission under Planning Application Reg. Ref. SD16A/0236 subject to the amendments and alterations to the previously approved biopharmaceutical manufacturing facility and warehouse extension and other additional, new development not forming part of SD16A/0236
SD23A/0079	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Decision Date: 14/06/2023 Decision: GRANTED Final Grant Date: 25/07/2023.	Alterations to a previously approved development (Reg. Ref. SD15A/0061 and Reg. Ref. SD16A/0398) which relates to a 10-year permission for the construction of a Peaker Power Plant in a single storey building with a mezzanine level, together with associated plant equipment including water & fuel tanks.

SD23A/0039	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Decision Date: 24/04/2023 Decision: GRANTED Final Grant Date: 07/06/2023.	Provision of an establishment to which to European Communities (Major Accident Hazards involving Dangerous Substances) Regulations 2006 as amended by Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 apply, constituting a change of use; The new establishment will include all the existing and permitted buildings (SD13A/0143 as amended by SD13A/0265, SD14A/0194 as amended by SD15A/0343, SD16A/0088 as amended by AD17A/0318 & SD20A/0283, SD21A/0203 & SD21A/0288, all within an existing campus; The proposal relates to the total quantum of fuel oil to be stored within existing and permitted tanks across the existing and permitted buildings; For the avoidance of doubt no works or physical development is proposed and the application relates to an existing development which comprises or is for the purpose of an activity requiring an integrated pollution prevention and control (IE) licence.

Appendix 1.2

CONSULTANTS AND EXPERTISE

APPENDIX 1.2: CONSULTANTS AND EXPERTISE

Chapter	Contributor	Person(s) Responsible	Expertise
1. Introduction and Methodology	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	Gavin Lawlor is a Director of Tom Phillips + Associates. He holds a BA (Social Science) from University College Dublin, where he graduated in 1995 with a master's degree in Regional and Urban Planning (MRUP) Degree and is a Full Member of the Irish Planning Institute (IPI) with 25 years' experience. Bernard Dwyer is a Member of the Irish Planning Institute and has been practicing as a town planner for over 9 years. Bernard holds a postgraduate master's degree in planning and Sustainable Development (Hons), (2014) UCC.
2. Site Location and Context	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
3. Description of the Proposed Development	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
4. Key Alternatives Considered	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
5. Population and Human Health	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
6. Biodiversity	AWN Consulting (AWN)	Ger O'Donoghue	Ger is the principal ecologist with Moore Group and has 30 years' experience in ecological impact assessment. He graduated from ATU Galway in 1993 with a B.Sc. in Applied Freshwater & Marine Biology and subsequently worked in environmental consultancy while completing an M.Sc. in Environmental Sciences, graduating from Trinity College, Dublin in 1999. (He also has over 15 years' experience of carrying out bat surveys and has completed the Bat Conservation Ireland, Bat Detector Workshop which is the

			standard training for the carrying out of bat surveys in Ireland and follows the Bat Conservation Ireland 'Bat Survey Guidelines' - Aughney *et al*., 2008'. In addition, Ger is an active member of the Galway Bat Group and Bat Conservation Ireland, which monitors bat populations in Ireland, and facilitates the education of bat communities to the public.
7. Land, Soils and Ground Water	AWN Consulting (AWN)	Hana Blandford Marcelo Allende	Hana is an Environmental Consultant at AWN, working on a range of projects involving EIA Reports, EPA licence applications and site visits carrying out Soil, Water and Air sampling for analysis. She holds a BSc. Agri-Environmental Science with structured electives in Earth Sciences from University College Dublin. Marcelo is a Senior Environmental Consultant (Hydrologist) at AWN with over 17 years of experience in Environmental Consulting as well as hydrological and hydrogeological technical studies. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments, Due Diligence reporting, baselines studies, soils, surface water and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. He also has detailed knowledge of environmental guidance, legislation, regulations & standards, and expertise in GIS (expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (IAH, Irish Group) and a member of Engineers Ireland (MIEI).

8. Hydrology (Surface Water and Waste Water)	AWN Consulting (AWN)	Hana Blandford Marcelo Allende	As above
9. Air	AWN Consulting (AWN)	Ciara Nolan	Ciara Nolan is a senior environmental consultant in the air quality and climate section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. Eng. in Energy Systems Engineering. She is a Member of both the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Science (MIEnvSc). She has over 7 years' of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical and data centre.
10. Climate	AWN Consulting (AWN)	Ciara Nolan	As above
11. Noise and Vibration	AWN Consulting (AWN)	Aoife Kelly Finnian Hurley	Aoife Kelly (Senior Acoustic Consultant) holds a BSc(Hons) in Environmental Health and a PhD in Occupational Noise. She has completed the Institute of Acoustics Diploma in Acoustics and Noise Control and won the 2016 Association of Noise Consultants (ANC) best diploma project for speech intelligibility in schools. Working in the area of acoustics since 2013, she has extensive experience in occupational noise surveying and environmental acoustics. Finnian Hurley (Acoustic Consultant) has a BA(Hons) in Music as well as an M.Phil in Music & Media Technology from Trinity College Dublin. He has a background in audio engineering, ambisonics, and VR related technology. He has experience in environmental noise surveying, modelling, and building acoustics.
12. Material Assets – Waste	AWN Consulting (AWN)	Chonaill Bradley	Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental

(Construction and Demolition)			Science from Griffith University, Australia and a Postgraduate Diploma in Circular Economy Leadership for the Built Environment from the Atlantic Technological University, Galway. He is an Associate Member of the Institute of Waste Management (AssocCIWM). Chonaill has over nine years' experience in the environmental consultancy sector and specialises in waste management.
13. Material Assets – Traffic and Transportation	Barrett Mahony Consulting Engineers (BMCE)	Martin Rogers	Martin Rogers (BA, BE, M.EngSc, PhD, CEng, TPP MICE, MRTP, MTPS) is a Transport Planning Professional, Chartered Civil Engineer, and Chartered Town Planner. Martin has over 40 years' experience ac
14. Material Assets – Site Services	Barrett Mahony Consulting Engineers (BMCE)	Christina Fox	Christina Fox is a Chartered Engineer with Engineers Ireland and has been practicing as a consulting engineer for over eleven years. Christina holds an undergraduate degree in Civil Engineering and a Master's degree in Structural and Geotechnical Engineering.
15. Cultural Heritage incl. Archaeology	IAC Archaeology (IAC)	Faith Bailey Jonny Small	Faith Bailey (MA, BA(Hons), MIAI, MCIfA) has over 20 years of experience in archaeological and cultural heritage consultancy and has been responsible for the production of multiple EIAR and assessments for all aspects of development nationwide.
16. Landscape Visual Impact Assessment	Murray & Associates	John Ward	John Ward has been in practice since 1993 and is Principal landscape architect at Murray & Associates. He hold's a full Master's degree in landscape architecture from University College Dublin (1993) and is a full Corporate Member of the Irish Landscape Institute.
17. Interactions and Cumulative Impacts	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
18. Mitigation	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above
19. Difficulties Encountered	Tom Phillips + Associates (TPA)	Gavin Lawlor Bernard Dwyer	As above

Non-Technical Summary	All Contributors	Gavin Lawlor Bernard Dwyer	As above

Appendix 2.1

AERONAUTICAL ASSESSMENT REPORT

Aeronautical Assessment Report

re
Media Park

at
Grange Castle West
County Dublin

for
Lens Media Limited

February 2024

O'Dwyer & Jones Design Partnership
Aviation Planning & Architecture Consultants
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Note: In all maps /diagrams /aerial photos in this report which do not contain a North Point, north lies to the top.

1. Scope of Report and Description of the Site.

1.1 Scope of this Report:

This report assesses the aviation impact of a proposed Media Park for Lens Media Ltd. at Grange Castle West in County Dublin.

The site of the proposed development *(outlined in red in the aerial photo below)* lies between two aerodromes in South County Dublin: it is at 2.0km from Casement Aerodrome (2.4km from Casement's Runway 10 Threshold), and at 2.2km from Weston Airport (2.6km from Weston's Runway 07 Threshold).

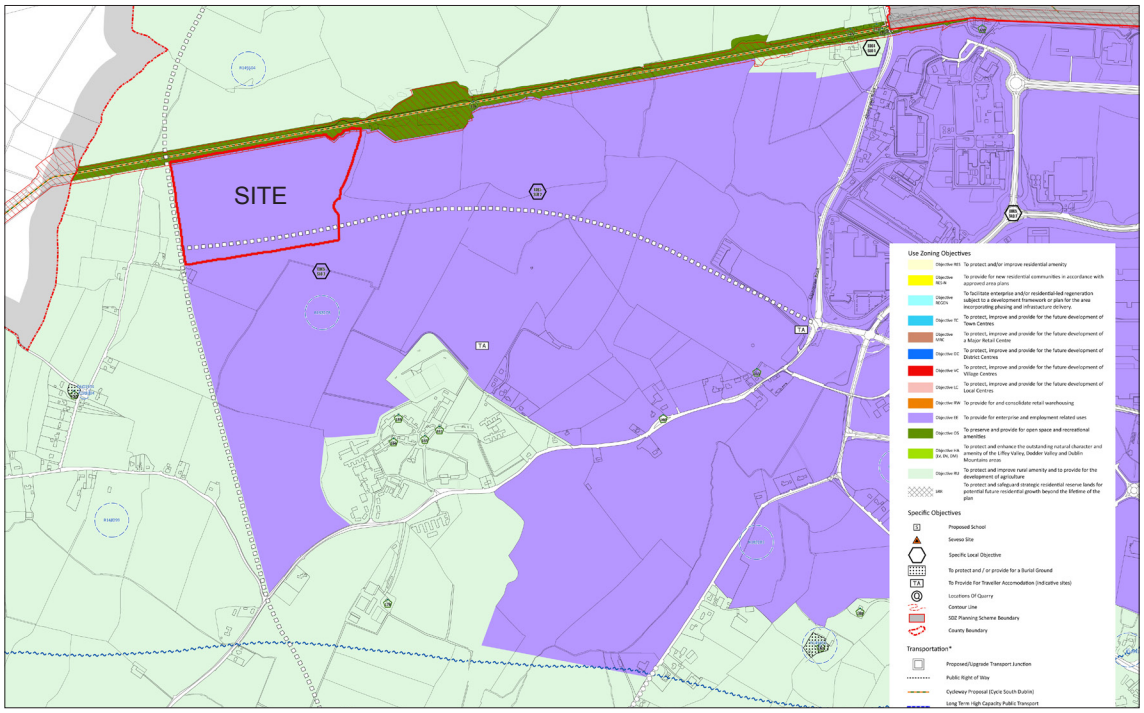
The aerial photo below shows the Media Park site in relation to Weston and Casement Aerodromes. The locations of the two Cross-Section drawings (on pages 11 & 13 of this Report) are also indicated – one perpendicular to Casement's Runway 10/28, and the other perpendicular to Weston's Runway 07/25.

1.2 Description of the Site:

The proposed Media Park is to be located on a site of 22.66 ha. approx. in Grange Castle West, to the north of Peamount Hospital and immediately south of the Grand Canal, in County Dublin *(outlined in red on the aerial photo below, with proposed buildings in blue)*. Ground levels on the site rise from 68m OD approx. to 76m OD approx., with FFLs of the proposed buildings at 68.75m OD (near the north-west corner of the site) to 74m OD (near the south-east corner of the site).

1.3 Site Zoning:

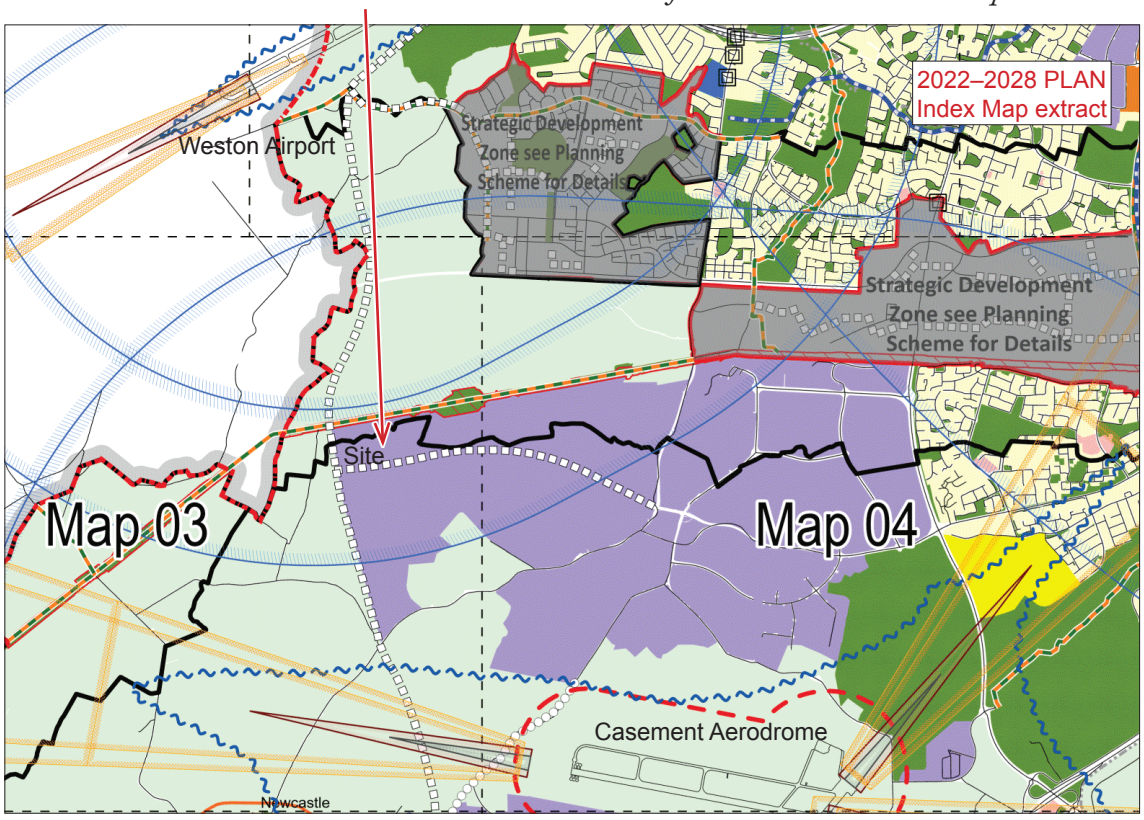
The site's zoning (as shown in the combined extracts from SDCC Development Plan Maps 3 & 4 below) is "*Objective EE – To provide for enterprise and employment related uses.*"



2. Aviation-Related Items in the Vicinity of the Media Park Site

2.1 The Department of Defence has adopted the International Civil Aviation Organization's [ICAO's] "Obstacle Limitation Surfaces" in relation to Casement Aerodrome. Being a military aerodrome, Casement is not bound by these *civil* aviation standards, but the Department of Defence has opted to apply these Standards at Casement to protect aircraft in flight. These "Surfaces" – which currently also apply at Weston Airport – are set out by ICAO as *International Standards and Recommended Practices* in its *"Annex 14 – Aerodromes"* document *[eighth revised edition of 8th November 2018].*

The site's location is arrowed on the extract below from the SDCC Index Map 2022-28:



2.2 **The Site in relation to Aviation & Aeronautical Items in its Vicinity:**

It can be seen *(from the Index Map extract above)* that the site – bounded to the north by the Grand Canal, and to the west and south by future roadways – lies outside all Approach & Take-off-climb Surfaces to/from Casement's & Weston's runways *(in orange)*, outside Casement's Security Zone *(red hatch)*, outside all current Airport Noise Zones *(blue chain-hatch)*, and outside all of both aerodromes' new Public Safety Zones *(in brown)*.

However, the site, at 2.4km from Casement's Threshold 10, does lie under Casement Aerodrome's "**Inner Horizontal Surface**"; and at 2.6km from Weston's Threshold 07, the site also lies under Weston Airport's **"Conical Surface"** *(these "surfaces" are shown above as curving blue lines centred on the relevant aerodrome).*

3. Relevant S.D.C.C. Development Plan Paragraphs

3.1 Of relevance to the aeronautical/aviation assessment of the Media Park site at Grange Castle are the paragraphs reproduced below from the current South Dublin County Council Development Plan 2022-2028, which include —

3.2 **Section 11.8 re 'Airports and Aerodromes' in general, on page 417 of the Plan:**

11.8 Airports and Aerodromes

This section sets out the general restrictions and requirements on development within the County for Dublin Airport, Casement Aerodrome and Weston Airport. The safeguarding requirements in the vicinity of civil aerodromes located in South Dublin (Dublin Airport and Weston Airport) are set out in:

a. International Standards and Recommended Practices' within *Annex 14* to the *Convention on International Civil Aviation*, which is published by the International Civil Aviation Organisation (ICAO) and the Irish Aviation Authority Guidance Material on Aerodrome Annex 14 Surfaces (2015);
b. Certification Specifications & Guidance Material for Aerodromes Design published in 2017 by the European Aviation Safety Agency (EASA).

Safeguarding is dealt with in more detail in Chapter 12: *Implementation and Monitoring.*

Casement Aerodrome is a fully equipped military base and includes the main centre for Air Corps Operations. Its operations and requirements are dealt with by the Department of Defence.

3.3 **Paragraphs 11.8.1 & 11.8.2 re 'Casement Aerodrome,' on page 418 of the Plan:**

Casement Aerodrome, being a military aerodrome, does not come under the control of the Irish Aviation Authority but the ICAO Standards and Recommended Practices are applied as policy by the Department of Defence. Additionally, the Department of Defence applies a 'Security Zone' closely aligned with the areas around the runways known as flight strips.

11.8.2 Casement Aerodrome

Casement Aerodrome is in continuous aviation use and is the only fully equipped military airbase in the State serving as the main centre of Air Corps operations. The aerodrome has two runways:

1 Runway 10 / 28: The existing main runway with east to west orientation (north of Newcastle and over Kingswood);
2 Runway 04 / 22: Existing secondary runway with a south-west to north-east orientation (04 over Rathcoole and 22 over Corkagh Park).

3.4 **Paragraph 11.8.3 re 'Weston Airport' on page 419 of the Plan:**

11.8.3 Weston Airport

Weston Airport consists of one runway, designated as a Code 2B runway by ICAO and EASA definitions. Weston Airport obstacle limitations surfaces overlap with those of Casement Aerodrome. In instances of overlap, the more stringent requirements of the two Aerodromes shall apply.

3.5 Policy (and Objectives) IE9 re Casement Aerodrome on pp. 418-9 of the Plan:

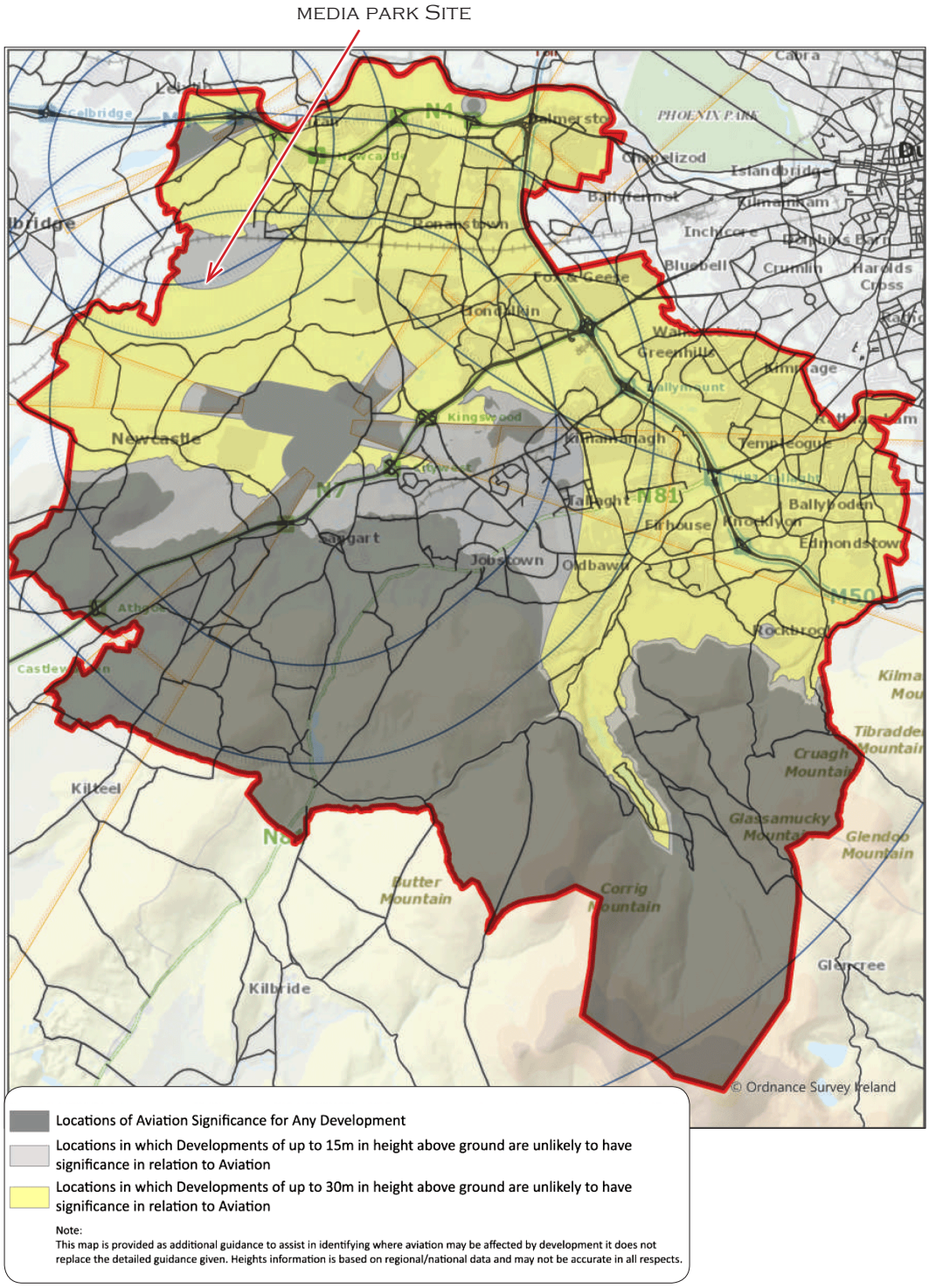
Policy IE9: Casement Aerodrome
Safeguard, having regard to the requirements of the Department of Defence, the current and future operational, safety and technical requirements of Casement Aerodrome and facilitate its ongoing development for military and ancillary uses.
IE9 Objective 1: To ensure the safety of military and other air traffic, present and future, to and from Casement Aerodrome with full regard for the safety of persons on the ground as well as the necessity for causing the least possible inconvenience to local communities.
IE9 Objective 2: To maintain the airspace around Casement aerodrome free from obstacles to facilitate aircraft operations to be conducted safely, as identified in the Development Plan Index map and Map 12 and as outlined in Chapter 12: *Implementation and Monitoring*.
IE9 Objective 3: To implement the principles of shielding in assessing proposed development in the vicinity of Aerodromes, having regard to Section 3.23 of the Irish Aviation Authority *Guidance Material on Aerodrome Annex 14 Surfaces* (2015) (See Chapter 12: *Implementation and Monitoring*).
IE9 Objective 4: To prohibit and restrict development in the environs of Casement aerodrome, where it may cause a safety hazard. (See also Policy IE13 Public Safety Zones and Chapter 12: *Implementation and Monitoring*).

3.6 And Policy (and Objectives) IE10 re Weston Airport on p. 419 of the Plan:

Policy IE10: Weston Airport
Safeguard, having regard to the requirements of the Irish Aviation Authority (IAA), the current and future operational, safety and technical requirements of Weston Airport and prevent encroachment of development around the airport which may interfere with its safe operation, in the context of the proper planning and sustainable development of the area and the protection of surrounding amenities.
IE10 Objective 1: To safeguard air traffic to and from Weston Airport while ensuring the least possible inconvenience to local communities and with full regard for the safety of persons on the ground (see also section 11.7.7 Public Safety Zones).
IE10 Objective 2: To maintain the airspace around the airport free from obstacles so as to facilitate aircraft operations to be conducted safely, including restricting development in the environs of the aerodrome, as identified by the Obstacle Limitations surfaces shown on the Development Plan Index map and Map 12 and as outlined in Chapter 12: *Implementation and Monitoring*.
IE10 Objective 3: To prohibit and restrict development in the environs of Weston Airport, where it may cause a safety hazard to the operation of the airport.

3.7 **Figure 12.1 on page 525 of the 2022-28 Plan (containing general height guidelines), in Section 12.11.5 re 'Aviation, Airports and Aerodromes':**

The Media Park site, located between Weston Airport and Casement Aerodrome (and under Weston's "Conical Surface" and Casement's "Inner Horizontal Surface") is in a light-grey-coloured area shown on this map (in which – in particular – structures of more than 15m in height require aviation assessment). The tallest building in the proposed development ("Stage 7") is 23.04m high, and seven of the proposed buildings are greater than 15m in height.



4. Site Layout and Elevations-OD of the Proposed Development

4.1 Site and Roof Plan:

Below, to approximate scale 1:3,500, is a Roof & Site Plan of the proposed Media Park at Grange Castle, with elevations-OD of the highest elements.
In this diagram, darker blue shading indicates higher roof elements.

SITE PLAN OF PROPOSED DEVELOPMENT
WITH ELEVATIONS (O.D.) OF HIGHEST PARTS
SCALE 1:3,500 APPROX.

BUILDING NOS. SHOWN THUS: #1 ... #20

4.2 **Schedule of Elevations-OD of the Proposed Media Park Buildings:**

Listed below are the names, FFLs, elevations-OD of highest points, and distances from Weston Airport's Runway 07/25, of all the proposed Media Park buildings.

The **distances** from Weston's Runway 07/25 (& from THR 07) of the nearest points of all buildings are included, because these figures are required for calculation of the exact level of Weston Airport's "Conical Surface" above each building (and for estimation of available clearances for cranes across the site).

For Weston Airport's current Code 2 non-instrument-approach status, its "Conical Surface" commences at 2.5km from the centreline of Runway 07/25, and rises at 5% slope over a horizontal distance of 1.1km – from 91.3m OD (at 2.5km from Rwy 07/25) to 146.3m OD (at 3.6km from Rwy 07/25). Consequently Weston's sloping "Conical Surface" lies above the entirety of the Media Park site.

The table below includes the elevation-OD* of this "Conical Surface" above each of the 20 buildings, and this item is assessed further in Section 7 on page 12 following.

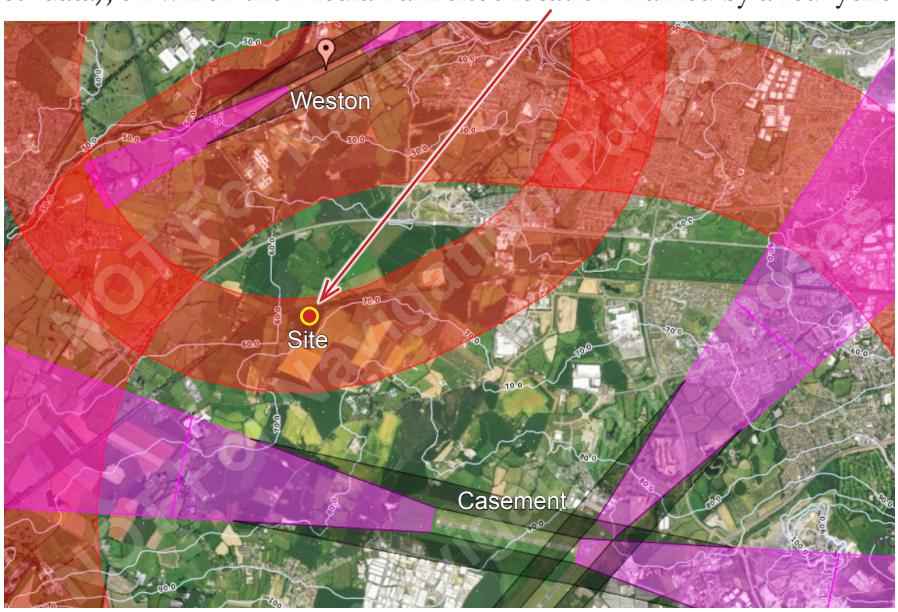
* *The Conical Surface elevations-OD are calculated as follows —*
(Distance from Rwy, minus 2.5km) ×5%, plus 91.3m = Conical Surface elev.OD

Bldg. no.	*Building Type*	FFL(OD)	Highest point	*Building's distance from Rwy 07/25*	*'Conical Surface' elev.*	
#1	Stages 5 & 6	**68.75m**	88.83m OD	2.69km	100.8mOD	
#2	Stages 3 & 4	69.0m	89.21m OD	2.685km	100.55m	*clearance***
#3	Stages 1 & 2	69.25m	89.41m OD	2.68km	100.3m	
#4	TV Studios	70.5m	88.788m OD	2.67km	99.8m	11.01m
	& Reception	70.05m	81.05m OD	2.66km	99.3m	
#5	Café	71.0m	76.607m OD	2.70km	101.3m	
#6	Dining & Office	71.0m	84.158m OD	2.67km	99.8m	
#7	Production Suite	72.5m	78.523m OD	2.75km	103.8m	
#8	Production Suite	72.5m	78.523m OD	2.77km	104.8m	
#9	Production Suite	72.5m	78.523m OD	2.79km	105.8mOD	
#10	Main Entrance	73.0m	78.994m OD	2.81km	106.8m	
#11	Stages 10 & 11	**74.0m**	**94.16m OD**	2.86km	**109.3m**	10.89m *(min)*
#12	2nd Entrance	74.0m	77.959m OD	2.96km	114.3m	36.34m *(max)*
#13	Stages 8 & 9	71.525m	91.735m OD	2.88km	110.3m	
#14	Stage Bldg 7	71.315m	**94.355m OD**	2.885km	**110.55m**	16.19m
#15	Workshop 'D'	70.125m	78.933m OD	2.79km	105.8m	
#16	Workshop 'C'	70.375m	78.183m OD	2.785km	105.55m	
#17	Workshop 'B'	70.875m	79.683m OD	2.78km	105.3m	
#18	Workshop 'A'	71.125m	79.933m OD	2.78km	105.3mOD	
#19	Parking Decks	71.375m	84.481m OD	2.765km	104.55m	
#20	Production Office	73.375m	88.481m OD	2.80km	105.3m	16.82m

** The data above are also used in assessing Cranes clearances above each building (and cranes considerations are discussed further in Section 11.1 *on p.17 following* >).

5. The Development in relation to Casement's "Obstacle Limitation Surfaces"

5.1 The I.C.A.O. "Obstacle Limitation Surfaces" for Casement Aerodrome and Weston Airport are indicated in the drawing below (featuring Irish Aviation Authority "Asset" data), on which the Media Park site's location marked by a red+yellow dot.



From the diagram above it can be seen *(as noted on page 4)* that the site lies under Casement's "Inner Horizontal Surface" *and* under Weston's "Conical Surface."
[Detailed Cross-Sections through these "Surfaces" are shown on pages 11 & 13. >>]

5.2 **Assessment re Casement Aerodrome:**

The site lies at 2.4-3.0 km to the north-west of Casement's Runway 10 Threshold. As Casement's "**Inner Horizontal Surface**" extends to 4km from all of the aerodrome's runway centrelines, this means that the proposed development is located under Casement's "Inner Horizontal Surface", which lies flat above the site at **131.6m OD**.

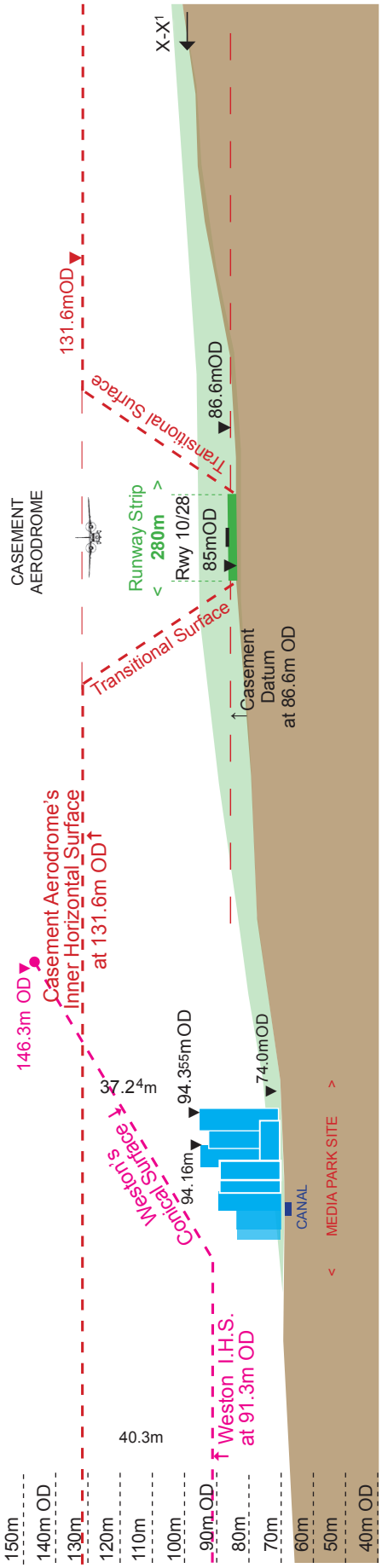
The highest element of the proposed development (the parapet of Building 11 – also called "Stages 10+11") extends to **94.16m OD**. As this elevation is **37.44m lower than Casement's "Inner Horizontal Surface"** it is therefore confirmed that the proposed development is well clear of that "Surface". It can also be seen that the site is very well clear of all of Casement's "Approach", "Take-off Climb", and "Transitional Surfaces" *(with the outer edge of Casement's nearest Transitional Surface at 1.4km+ from the Media Park site)*.

5.3 **Conclusion re Casement Aerodrome** *[See **Section Diagram** on the following page]* **:**

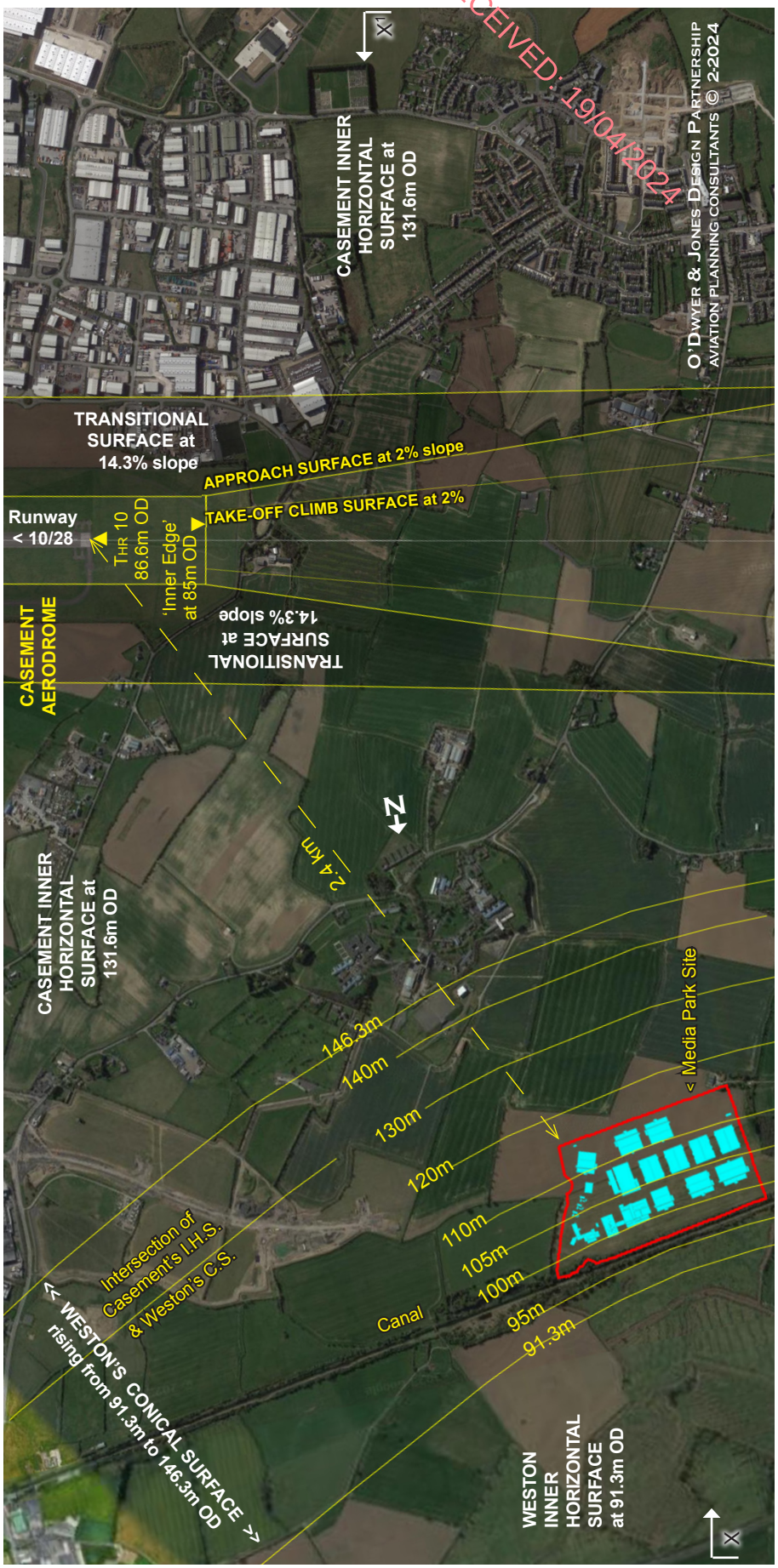
The one Casement "Obstacle Limitation Surface" which lies above the site is Casement's "Inner Horizontal Surface" at 131.6m OD – **37.44m higher than the highest element of all of the proposed development**. The site is fully clear of all other Casement "Surfaces", and it is therefore confirmed that **none of Casement's "Obstacle Limitation Surface" will be infringed by the proposed development**.

6. Cross-Section & Aerial Map Diagrams
Perpendicular to Casement's Runway 10/28

NB – Aeronautical Diagram: horizontal scale = 10× vertical scale.



Cross-Section Diagram *(above)* to approx. scales 1:2,000 (vertical) and 1:20,000 (horizontal) [A4-SIZE]



Plan Diagram *(below)* superimposed on aerial photograph, to approx. scale 1:20,000 [A4-SIZE]

7. The Development in relation to Weston's "Obstacle Limitation Surfaces"

7.1 Assessment Re Weston Airport:

The site lies at between 2.6km and 2.99km to the south of Weston Airport's Runway 07 Threshold. As Weston's current **Conical Surface** extends (in plan) between 2.5km to 3.6km from the centreline of Weston's Runway 07/25, this means that – in addition to being under Casement Aerodrome's "Inner Horizontal Surface" – all the site also lies under Weston's "Conical Surface".

7.2 Overlapping Casement and Weston "Surfaces":

Weston's "Conical Surface" rises at 5% slope from 91.3m OD (at 2.5km from THR 07), to 146.3m OD (at 3.6km from THR 07). However, Casement's "Inner Horizontal Surface" lies flat at 131.6m OD above the entire site, and therefore intersects Weston's "Conical Surface" along the line where that "Conical Surface" reaches 131.6m OD, which is at 3.306 km from the centreline of Weston's Runway 07/25. The location of this intersection is at 316m+ to the south of the Media Park site. Consequently the most relevant (i.e. lowest) "obstacle limitation surface" above all of the Media Park site is Weston Airport's "Conical Surface", which rises from north to south above the site – from 96.3m OD to 115.8m OD.

7.3 Distances Between Proposed Buildings and Weston's "Conical Surface":

Using the data listed in the Schedule in para. 4.2 on page 9 above, the distances between taller proposed buildings and Weston's "Conical Surface" are as follows:

Bldg. #1: 11.97m	Bldg. #2: 11.34m	Bldg. #3: 10.89m
Bldg. #4: 11.01m	Bldg. #6: 15.64m	Bldg. #11: 15.14m
Bldg. #13: 18.56m	Bldg. #14: 16.19m	Bldg. #19: 19.93m
Bldg. #20: 16.82m	[For all of the other buildings, distances are in excess of 20m.]	

The minimum distance between a proposed building and the "Conical Surface" is **10.89m** (above Building #3 – "Stages 1 & 2"), and the clearance above the tallest proposed building (the 23.04m-tall Building #14 – "Stage 7"), is **16.19m**.

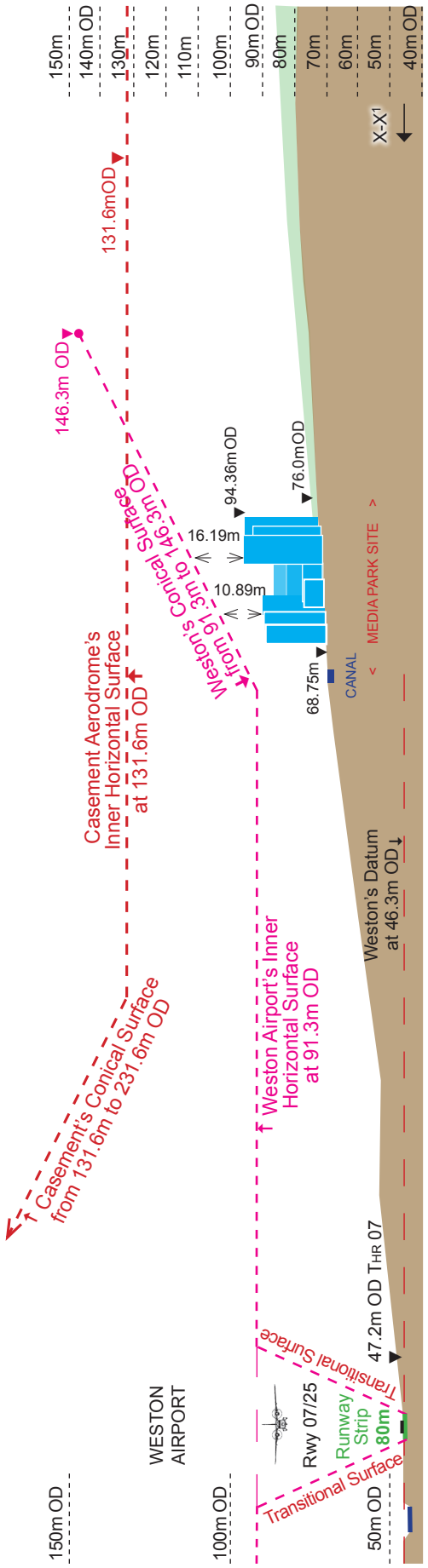
Therefore **all of the proposed development is well clear of all of Weston's "Obstacle Limitation Surfaces", with at least 10m clearance above for mobile crane operations.**

7.4 Conclusion re Weston Airport *[See **Section Diagram** on the following page]*:

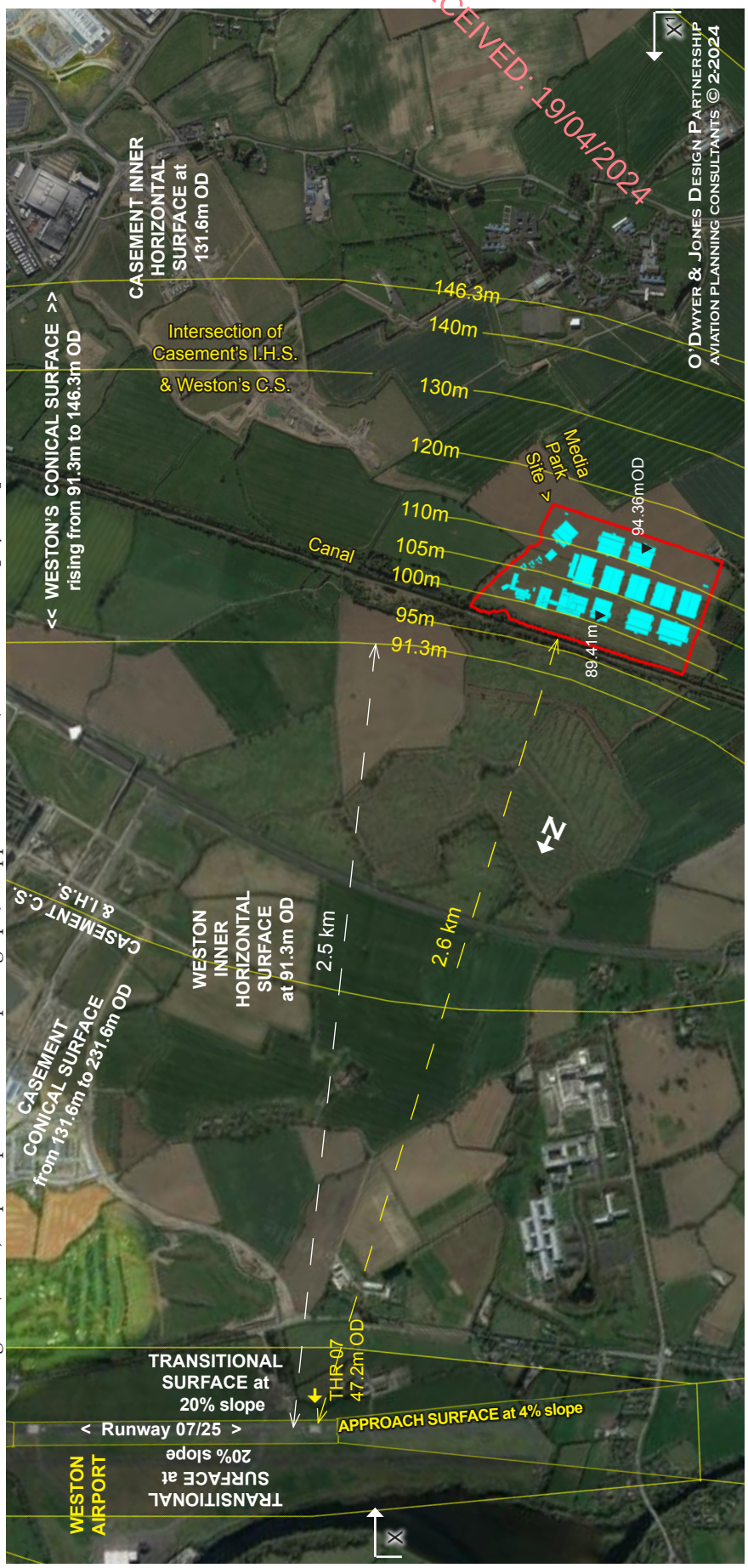
The one Weston "Obstacle Limitation Surface" which lies above all of the site is Weston's "Conical Surface" which rises from 99.3m to 114.3m+ directly above the proposed buildings. This is well clear of all buildings, being **at its nearest 10.89m+ above** the "Stages 1 & 2" building, and with greater clearances (of up to 36.34m) above all other buildings. It is therefore confirmed that **none of Weston's "Obstacle Limitation Surfaces" will be infringed by the proposed development**.

8. Cross-Section & Aerial Map Diagrams
Perpendicular to Weston's Runway 07/25

NB – Aeronautical Diagram: horizontal scale = 10× vertical scale.



Cross-Section Diagram *(above)* to approx. scales 1:2,000 (vertical) and 1:20,000 (horizontal) [A4-size]

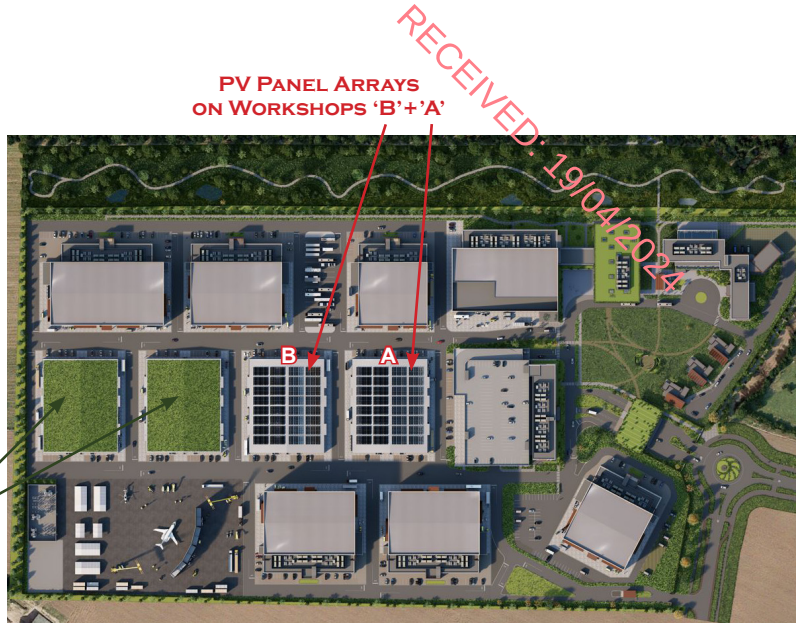


Plan Diagram *(below)* superimposed on aerial photograph, to approx. scale 1:20,000 [A4-size]

9. Solar/Photovoltaic Panels

9.1 Solar/PV panel provision:

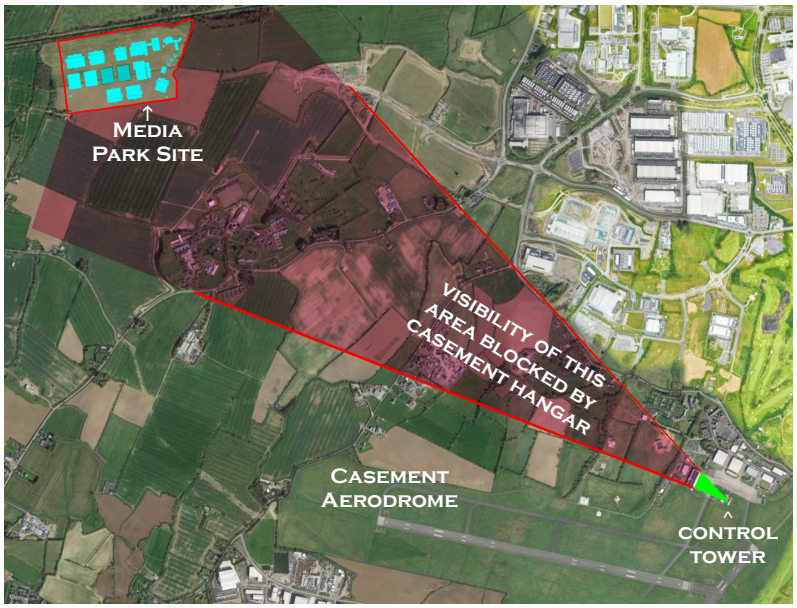
2,400 Solar/PV panels in all are proposed on the roofs of two Workshops 'A' & 'B' >> as illustrated opposite. *(These are also outlined on the Site+Roof Plan drawing on page 8 above).*



9.2 Aerodrome Control Towers:

As all of the proposed PV panels will be 23m+ lower than the control tower at Casement Aerodrome, an assessment of potential visibility of the proposed panels from that control tower has been carried out, which found that Casement's Hangar no. 5 (taller than the nearby control tower cab) will block all views towards the site and all views of the proposed PV panels *[see below]*. And as the panels are located 24m *higher* than Weston's control tower (with taller Stage Buildings etc. in between) the PV panels will also not be visible from Weston Airport's control tower.

9.3 Glint & Glare Assessment:

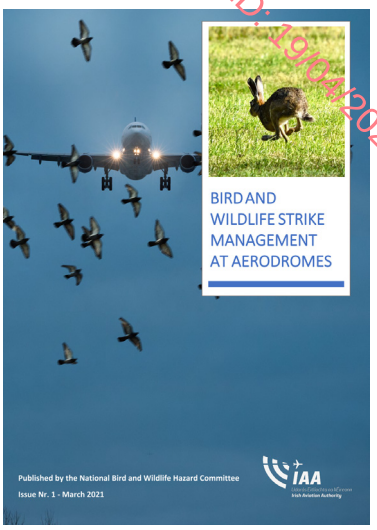


These solar/PV panel arrays have been the subject of a Glint & Glare assessment by MacroWorks Ltd. dated January 2024. In that Study, Casement Aerodrome, and Weston Airport, and all of their flight paths, have been assessed using the Federal Aviation Administration's Solar Glare Hazard Analysis Tool [SGHAT], and the Conclusion on page 10 of MacroWorks's Glint & Glare Assessment is as follows:

> " *4 OVERALL CONCLUSION*
> *4.1.1 From the analysis and discussions contained herein, it is considered that there will not be any significant nuisance effects from glint and glare along runway approaches or at the Air Traffic Control Towers at either of the identified airports – Casement and Weston, as a result of the proposed roof-mounted solar PV panels.* "

10 Bird Strike Hazard Mitigation in Landscape and SuDS Provision:

10.1 **Avoidance of Ponds**:



Bird Strike Hazard mitigation is advised by all aviation authorities – by the IAA in Ireland, by the CAA in the U.K., by the FAA in the U.S., and internationally by ICAO and EASA – all of whom advise avoidance of unnecessary ponds in the vicinity of aerodromes. In its ***"Bird and Wildlife Strike Management at Aerodromes"*** document of 2021, >> the Irish Aviation Authority includes the following:

"6.5 Water –

"Open, standing water, such as balancing ponds, reed beds and watercourses, drainage ditches or river channels, may attract large flocking birds, including ducks, geese, swans, grebes, waders, herons, coot, moorhen and cormorant. The more open water sites there are on and around an aerodrome, the more complex and frequent the movements of waterfowl will be. There may also be more activity at night than during the day."

Guidance as to relevant distances from an aerodrome is provided in the Federal Aviation Administration's *"Wildlife Hazard Management at Airports"* manual, >> which advises avoidance of all unnecessary open ponds or standing water **within at least 3km of a runway** (or taxiway) serving turbine aircraft.

Because the Media Park site is located 2.4km from Casement Aerodrome's runway 10/28, and at 2.6km from Weston Airport's runway 07/25 (i.e. within the 3km distances noted above) care has been taken to ensure that **the Landscaping and SuDS provision on the site will not include any ponds or other bird attractants.** Additionally, the large Swale in the Buffer Zone area *(indicated on the Site Plan drawing on p.8)* will be designed to retain flood-water for no longer than 48 hours at any one time (in accordance with guidance in the FAA manual above).

10.2 **'Green' Roofs**:

'Green' Roofs are proposed on several buildings in the Media Park *(as illustrated on the previous page, and separately shown in the Landscape Consultants' Drawings)*. To mitigate Bird Strike Hazard, these will all be sedum-planted roofs. In this context it may be noted that sedum-planted roofs are increasingly being introduced at airports themselves, of which notable examples are Chicago's Midway and O'Hare Airports, on which 350,000+ square feet (~32,500 m^2) of 'green' sedum-planted roofs have been installed – in relation to which the Chicago Department of Aviation states *"The sedum plant species used by the CDA are tolerant to drought and do not attract wildlife."*

10.3 **Wildlife Control During Construction:**

In its **Airport Services Manual Document 9137 *"Wildlife Hazard Management"*** (5th ed., 2020), >> the **International Civil Aviation Organization** includes the following —

"4.4.2 A 13-km circle centred on the aerodrome reference point is recognised where land use should be assessed with regard to wildlife hazard management. … States should consider all aviation safety concerns related to land development in the vicinity of the aerodrome to minimize the attraction of wildlife."

In accordance with this ICAO guidance, the management of building-site operations at the Media Park development (which is at just under 2.5km from two aerodromes) will require the contractor and subcontractors to limit potential bird & wildlife attractants during construction, as follows —

(a) by controlling debris on site, and in particular controlling any food waste;
(b) by managing all trenches, topsoil removal, and earthmoving, to ensure that debris or topsoil will not remain exposed; and
(c) by ensuring that any flooded or exposed earth areas are covered.

The project's Construction Environmental Management Plan will provide for these items. And in addition to wildlife control aspects, the CEMP will also require that any dust or smoke-producing operations, or use of lasers on site (which might interfere with aviation), be strictly controlled.

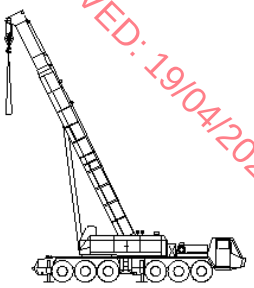
10.4 **Ongoing Wildlife Control:**

In accordance with the advice of all aviation authorities, ongoing wildlife control and bird strike hazard mitigation on the Media Park site will include —

(a) avoidance of landscape elements which might provide avian food;
(b) ongoing avoidance of unnecessary standing water features, and management of any flood control swales to ensure that they will not retain water for more than 48 hours at any one time;
(c) such ongoing bird control and deterrence measures as may be necessary (including possible implementation of trapping or culling under the Air Safety provisions of the *Wild Birds Declaration* Ministerial Order).

11. Other Aviation Considerations

11.1 Crane/s on Site During Construction:



It is intended that mobile cranes (only) will be used during construction, and care will be taken to ensure that all cranes used will operate below Weston's "Conical Surface". As stated in Section 7, the Schedule in para. 4.2 *(on page 9 above)* indicates that **clearances of between 10.89m and 36m+ below the nearest "obstacle limitation surface"** are available above the roofs of all of the proposed buildings: These clearances will be more than adequate for the proposed mobile crane operations during construction (and these operating limits will be noted in the CEMP).

In any event it will be necessary [under S.I. 215 of 2005 – *'Irish Aviation Authority (Obstacles to Aircraft in Flight) Order'*] for prior notification of the use of any crane/s to be submitted, at least 30 days in advance, to Weston Airport, and to Casement Aerodrome, and to the Irish Aviation Authority, who may issue lighting instructions and any necessary notices to pilots. In regard to Casement Aerodrome, advance notification in regard to cranes will be given to Air Corps Air Traffic Services by email to airspaceandobstacles@defenceforces and/or by telephone to 01-4037681.

And in the event that any outdoor crane-mounted cameras might be required in the future for filming purposes in the Media Park's Back Lot area, these will also be the subject of advance notification to – and agreement with – the IAA /Air-Nav Ireland, Casement Aerodrome, and Weston Airport, if any such crane may be required to extend higher than the adjoining tallest building on the site ("Stage 7", of 23m height AGL).

11.2 External Lighting etc.:

Being in the vicinity of two aerodromes, it is advised that permanent external lighting on the site will be of the "cut-off" variety (i.e. not showing light above the horizontal).

In the event of any upward-shining or exceptionally bright lights being required for filming or media purposes on the site, it is advised that these would be notified and agreed in advance with Weston Airport and Casement Aerodrome.

We would also recommend that advance notice be given to Weston Airport and to Casement Aerodrome (or the Department of Defence) in the event of any proposed use of pyrotechnics, firearms, or lasers, as part of outdoor filming/media operations on the "Back Lot" (or elsewhere on the Media Park site). Any use of drones at or near the site would be restricted and would require special aviation permissions.

The site is not in a location (or the proposed buildings of such height) that aviation warning lights would normally be required on buildings. However aviation authorities may require aviation lighting to be provided on any cranes that might extend above building roof levels.

12. SUMMARY

12.1 **The Development in Relation to Casement's "Obstacle Limitation Surfaces":**

Casement Aerodrome's "Inner Horizontal Surface" (flat, at 131.6m OD) lies above all of the site. As the tallest proposed proposed element (the parapet of "Stage 7" at 94.355m OD) is more than **37m lower** than this "Inner Horizontal Surface", **it is confirmed that no part of the proposed development will breach any of Casement Aerodrome's "Obstacle Limitation Surfaces."**

12.2 **The Development in Relation to Weston's "Obstacle Limitation Surfaces":**

Weston Airport's "Conical Surface" rises at 5% slope (from 96.8m to 115.8m) above all of the site, and lies at different elevations-OD above each building, with clearances varying from **10.89m (minimum)** to 36m+ (maximum). As all of the buildings are well below the "Conical Surface" directly above, **it is confirmed that no part of the proposed development will breach any of Weston Airport's "Obstacle Limitation Surfaces."**

12.3 **Solar/PV Panels, Cranes During Construction, & Bird Strike Mitigation:**

The PV panel arrays on roofs of the proposed buildings have been assessed and found satisfactory by Macro Works Ltd. in their Glint & Glare Study dated January 2024.

With 10m+ clearances for crane operations above all proposed buildings, cranes on site will not project above any "obstacle limitation surface"; and 30 days' advance notice of all proposed cranes will be given to the IAA, to Casement, and to Weston.

Bird Strike Hazard mitigation has been observed in the Landscaping and SuDS provision, and wildlife control measures will be adopted during construction.

12.4 **Overall:**

We consider that the proposed Media Park development at Grange Castle complies with all aviation and aeronautical requirements affecting its location, and an 'advance copy' of this report has been sent to the IAA, to the Department of Defence, and to Weston Airport.

J. Declan O'Dwyer B.Arch MBA RIBA
9th February 2024
O'Dwyer & Jones Design Partnership
Aviation Planning Consultants

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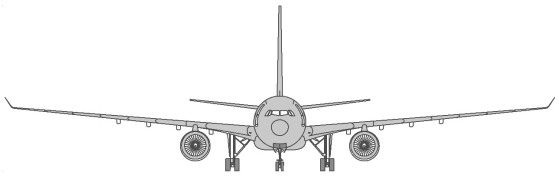

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Appendix 6.1

WINTERING BIRD, BAT, AND BADGER REPORT

Eire Ecology

Environmental Consultants

Wintering Bird, Bat & Badger Report

GC Media Park

Grange Castle

DOCUMENT DETAILS

Client:	Awn Consulting
Project Title:	Grange Castle Media Park
Address:	Brownstown, Co. Dublin
Document Title:	Bird and Bat Report
Prepared By:	John Curtin - Consultant Ecologist
Date:	21/11/2023

Table of Contents

1 INTRODUCTION

Eire Ecology was commissioned by Awn Consulting to carry out an assessment of birds and bat usage of lands located at Brownstown, Co. Dublin.

The present report was compiled by John Curtin of Eire Ecology providing information on flora and fauna. John Curtin B.Sc. is the principal ecologist with Eire Ecology and has over 10 years of experience in ecological impact assessment.

The report concentrates on ecological features within the development area of particular significance, primarily designated habitats and species, including habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare flora listed in the Flora Protection Order along with other semi-natural habitats of conservational value.

The report has been compiled in compliance with the European Communities Legal requirements and follows guidance outlined in the following documents:

- EPA Revised Guidelines on the Information to be contained in Environmental Impact Statements Draft September 2015.
- EPA Advice Notes on for Preparing Environmental Impact Statements Draft September 2015.

The European Habitats Directive 92/43/EEC (Article 6) indicates the need for plans and projects to be subject to Habitats Directive Assessment (also known as Appropriate Assessment) if the plan or project is not directly connected with or necessary to the management of a Natura 2000 site (which includes SACs and SPAs) but which has the potential to have implications on a site's conservation objectives. These implications can be significant effects either individually or in combination with other plans or projects.

2 ASSESSMENT METHODOLOGY

2.1 POLICY & GUIDANCE

2.1.1 EU Habitats Directive

The "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A "Special Conservation Area" or SAC is a designation under the Habitats Directive. The Habitats Directive sets out the protocol for the protection and management of SACs.

The Directive sets out key elements of the system of protection including the requirement for "Appropriate Assessment" of plans and projects. The requirements for an Appropriate Assessment are set out in the EU Habitats Directive. Articles 6(3) and 6(4) of the Directive.

2.2 EU Birds Directive

The "Birds Directive" (Council Directive 79/409/EEC as codified by 2009/147/EC) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection (Annex I species). Appendix I indicates Annex I bird species as listed on the Birds Directive. A "Special Protection Area" or SPA, is a designation under The Birds Directive.

SACs and SPAs form a pan-European network of protected sites known as Natura 2000 sites and any plan or project that has the potential to impact upon a Natura 2000 site requires Appropriate Assessment (AA). As outlined previously, an AA Screening Report was prepared for this project and is presented as a separate report to the planning application.

2.2.1 Wildlife Acts 1976 – 2012

The primary domestic legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976, as amended. The aims of the wildlife act according to the National Parks and Wildlife Service are "... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims." All bird species are protected under the act. The Wildlife (Amendment) Act of 2000 amended the original Act to improve the effectiveness of the Act to achieve its aims.

2.3 SURVEY METHODOLOGY

The assessment was carried out in three stages, firstly through desktop assessment to determine existing records in relation to habitats and species present in the study area. This included research on the NPWS metadata website, the National Biodiversity Data Centre (NBDC) database and a literature review of published information on flora and fauna occurring in the development areas.

The second phase of the assessment involved site visits to establish the existing environment in the footprint of the proposed development with particular reference to birds, bats and mammals. Signs of mammals were searched while surveying the study area at several occasions throughout winter of 2022 and spring 2023 noting any sights, signs or any activity in the vicinity especially along adjacent boundaries. The potential to host bat roosts was examined at the time of an walkover survey. A photographic record was made of the main features of interest. A static bat detector survey was conducted in May 2023, in addition to a walked night bat survey on the 6th of June. Wintering and migratory bird surveys were conducted from November 2022 to March 2023. The final part of the assessment involves an evaluation of the proposed development area and determination of the potential impacts on the fauna of the area. This part of the assessment forms the basis for Impact Assessment and is based on the following guidelines and publications:

- Assessment of plans and projects significantly affecting Natura 2000 sites (EC, 2002);
- Managing Natura 2000 Sites (EC, 2000);
- Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2007);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, December 2009, Rev 2010);
- Guidelines for Planning Authorities & An Bord Pleanala on carrying out Environmental Impact Assessments (March 2013)
- EPA Revised Guidelines on the Information to be contained in Environmental Impact Statements Draft September 2015.
- EPA Advice Notes on for Preparing Environmental Impact Statements Draft September 2015.
- Bat Mitigation Guidelines for Ireland V2 (National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, 2022).
- Hen Harrier Survey 2015 results (Irish Wildlife Manuals No. 93, Ruddock et al 2016)
- Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (2006)
- Natura Scheme for evaluating ecological sites (Nairn & Fossitt, 2004)
- Colhoun, K., and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014–2019. Irish Birds 9:523—544
- BirdWatch Ireland and the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government. Counter Manual. Guidelines for Irish Wetland Bird Survey Counters

- NRA (2009) 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes'
- Mc Guinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. & Crowe, O. (2015) Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. BirdWatch Ireland, Kilcoole, Wicklow
- Crowe, O (2005) Ireland's wetlands and their waterbirds: Status and Distribution. BirdWatch Ireland, Newcastle, Co Wicklow
- Scottish Natural Heritage (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2, SNH, Perth
- Natural England Guidance for bird surveys in relation to development https://www.gov.uk/guidance/ wild-birds-surveys-and-mitigationfor-development-projects#surveymethods
- Natural England Guidance for bird surveys in relation to onshore windfarms https://www.gov.uk/ guidance/wild-birds-surveys-and monitoring-for-onshore-wind-farms
- Wetland Bird Survey (WeBS): Numbers and Trends
- British Trust for Ornithology. Bird Atlas 2007-11, Field Methods.

The location of the proposed development in the townland of Brownstown, Co. Dublin is presented in Figure 2-1 below.

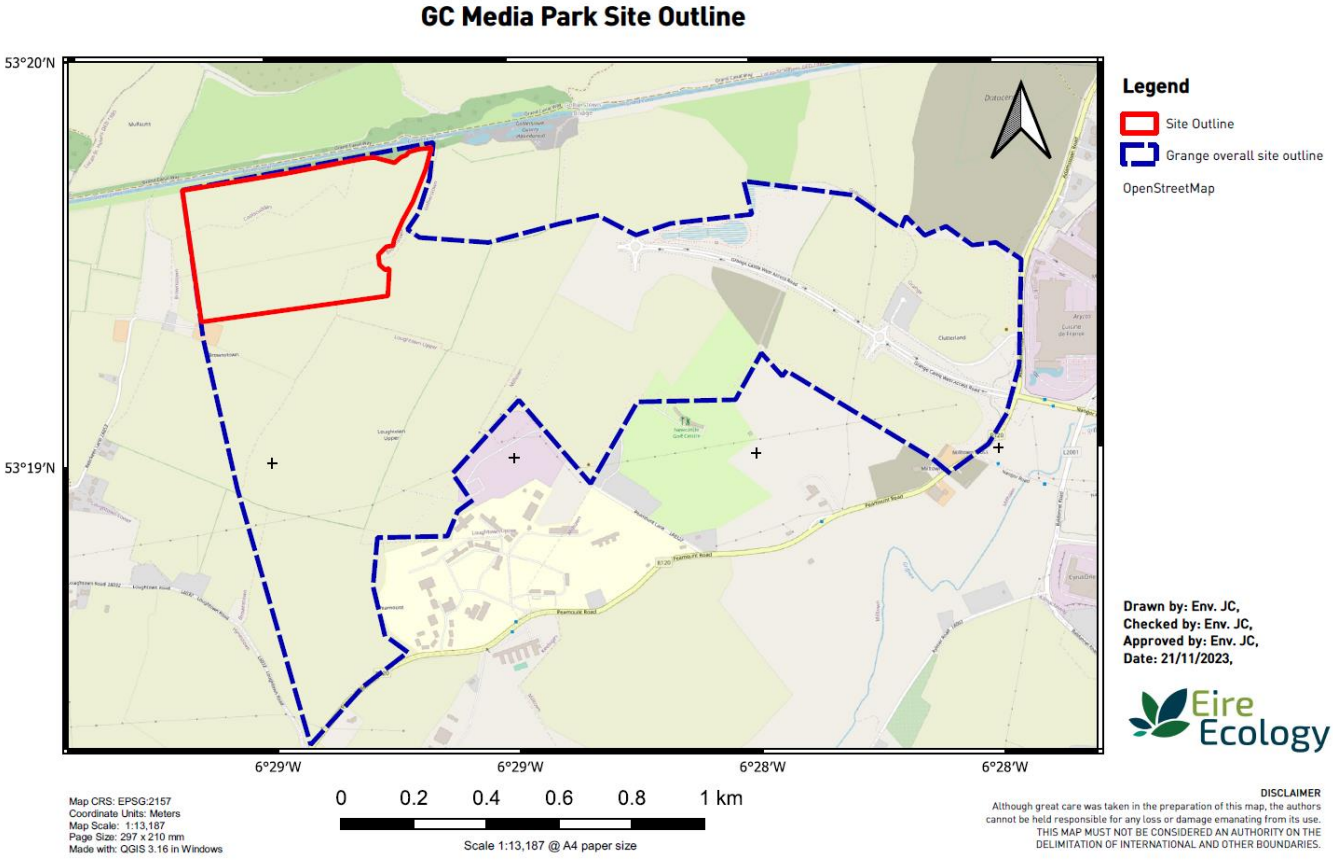

Figure 2-1 Showing the indicative site location at Brownstown, Co. Dublin.

3 PROJECT DESCRIPTION

The site in question is located within agricultural lands. While the site is located in the townland of Brownstown it forms part of a larger Grange Castle West site owned by South Dublin County Dublin and set for development as an industrial park.

4 EXISTING ENVIRONMENT

4.1 DESIGNATED CONSERVATION AREAS

The site for the proposed development lies approximately 300m from the Grand Canal pNHA. The closest European designate site is Rye Water Valley/Carton SAC situated 4.2km to the north, at the far side of the Liffey River (see Figure 4-1).

No Special Protection Areas (Birds Directive) are located within a 15km zone of the subject site with the closest Wicklow Mountains SPA (Site Code: 004040) located 15.1km to the south.

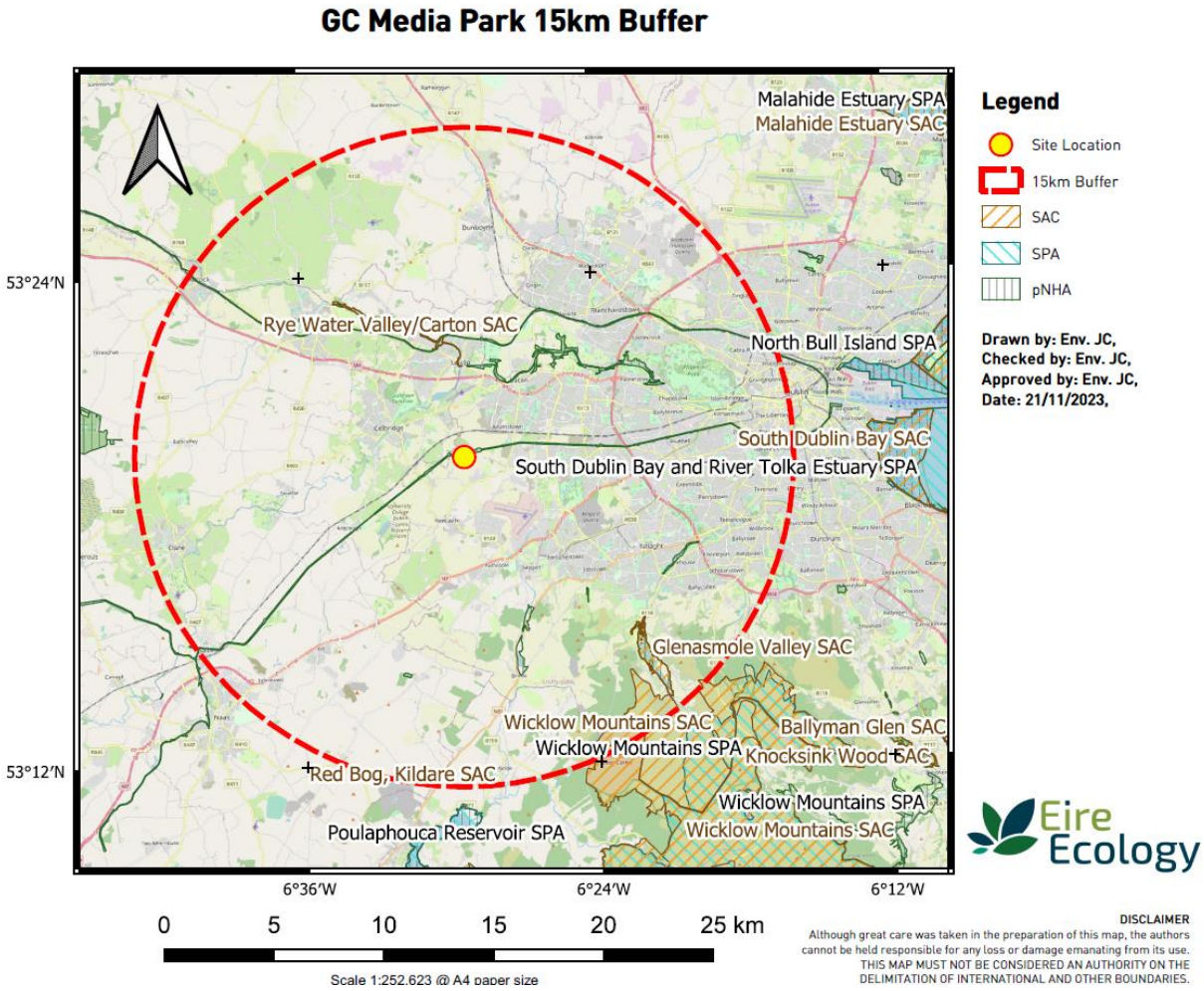

Figure 4-1: Indicative site location in relation to SAC's and pNHA's.

Table 4-1 Protected habitats with ornithological & mammal value in the vicinity of the proposed development

Site	Site Code	Distance	Has the designated site a high ornithological / mammal value?	Has the site ornithological / mammal connectivity to the subject site?
Proposed National Heritage Areas (pNHA's)				
Grand Canal pNHA	002104	0.3km	Yes. Provides an ecological corridor for bird and bat species.	Located to the north of the subject site. Potential connectivity.
Liffey Valley pNHA	000128	3.8km	Although birds and bats are not noted within the Site Synopsis document for this site, Daubenton's bats have been recorded here.	Connectivity to subject site impacted by M4 and railway line.
Royal Canal pNHA	002103	5.1km	Otter are noted from the Site Synopsis document. Although birds and bats are not noted within the Site Synopsis document for this site, Daubenton's bats have been recorded here.	Lacks connectivity to subject site.
Slade Of Saggart & Crooksling Glen pNHA	000211	6.8km	Yes. Wildfowl species mentioned in site description.	Lacks connectivity to subject site. The Naas Roads provides a barrier between the site. Carmac River flows NE, away from the subject site.
Lugmore Glen pNHA	001212	7.7km	Birds and bats are not noted within the Site Synopsis document for this site	Lacks connectivity to subject site.
Kilteel Wood pNHA	001394	9.6km	Birds and bats are not noted within the Site Synopsis document for this site	Lacks connectivity to subject site.
Dodder Valley pNHA	000991	10.0km	Yes. Forty-eight bird species have been recorded in the area, including Little Grebe, Kingfisher, Dipper and Grey Wagtail. Part of the river bank supports a Sand Martin colony of up to 100 pairs.	Lacks connectivity to subject site.
Special Protected Areas (SPA's) / Special Areas of Conservation (SAC's)				
Rye Water Valley/Carton SAC	001398	4.2km	Blackcap, Woodcock, Long-eared Owl, Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher have been recorded from the site.	Located to the north of the site with M4 and railway line separating sites.
Glenasmole Valley SAC	001209	10.3km	Bats, otter and kingfisher are mentioned in the site synopsis.	Lacks connectivity to subject site. The Naas Roads provides a barrier between the site. Dodder River flows NE, away from the subject site.
Wicklow Mountains SAC	002122	11.8km	Meadow Pipit, Skylark, Raven and Red Grouse are resident throughout the site. Wheatear, Whinchat and the scarce Ring Ouzel are summer visitors. Wood Warbler and Redstarts are rare breeding species of the woodlands. Dipper and Grey Wagtail are typical riparian	Many of the bird species noted are unlikely to utilise the subject site given the distances involved. Merlin and Peregrine move to the lowlands during the winter months in order to hunt wintering birds so its possible birds from here could hunt within the site.

Site	Site Code	Distance	Has the designated site a high ornithological / mammal value?	Has the site ornithological / mammal connectivity to the subject site?
			species. Merlin and Peregrine, both Annex I species of the E.U. Birds Directive, breed within the site. Recently, Goosander has become established as a breeding species.	
Red Bog, Kildare SAC	000397	13.9km	Mute Swan, Mallard, Tufted Duck, Coot, Moorhen, Snipe and Black-headed Gull have been recorded breeding within the site	Lacks connectivity to subject site.
Wicklow Mountains SPA	004040	15.3km	Designated for Merlin (*Falco columbarius*) and Peregrine (*Falco peregrinus*)	The subject site sits over 15km from the SPA. It is possible these species move to the lowlands during the winter months in order to hunt wintering birds
Poulaphouca Reservoir SPA	004063	15.5km	Designated for Greylag Goose (*Anser anser*) and Lesser Black-backed Gull (*Larus fuscus*)	The subject site sits over 15km from the SPA. Unlikely CO's from this site utilise the subject site.

4.1.1.1 Designated species recorded in the surrounding area

The NBDC database was consulted for details on designated records held for the site and the surroundings. The database was consulted on the 30/05/2023 and rechecked on the 21/11/2023 for details on historical records from the site and the surrounding 2km square; O03A. Results are outlined in Table 4-2.

Table 4-2: Designated birds and mammals recorded in the O03A 2km grid

Species name	No. of records	Date of last record	Designation
Birds			
European Golden Plover (Pluvialis apricaria)	1	31/12/2011	Wildlife Acts || EU Birds Directive Annex I, II & III || BoCCI - Red List
Common Pheasant (Phasianus colchicus)	2	31/12/2011	Wildlife Acts || EU Birds Directive >> Annex II & III
Common Wood Pigeon (Columba palumbus)	2	31/12/2011	Wildlife Acts || EU Birds Directive >> Annex II & III
Northern Lapwing (Vanellus vanellus)	1	31/12/2011	Wildlife Acts || EU Birds Directive Annex II, Section I Bird Species || BoCCI - Red List
Barn Swallow (Hirundo rustica)	2	27/08/2017	Wildlife Acts || BoCCI - Amber List
Common Grasshopper Warbler (Locustella naevia)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
Common Linnet (Carduelis cannabina)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
Common Starling (Sturnus vulgaris)	2	31/12/2011	Wildlife Acts || BoCCI - Amber List
Common Swift (Apus apus)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
Eurasian Tree Sparrow (Passer montanus)	2	31/12/2011	Wildlife Acts || BoCCI - Amber List
House Martin (Delichon urbicum)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
House Sparrow (Passer domesticus)	2	31/12/2011	Wildlife Acts || BoCCI - Amber List
Little Grebe (Tachybaptus ruficollis)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
Mute Swan (Cygnus olor)	2	31/12/2011	Wildlife Acts || BoCCI - Amber List
Sky Lark (Alauda arvensis)	1	31/12/2011	Wildlife Acts || BoCCI - Amber List
Black-headed Gull (Larus ridibundus)	1	31/12/2011	Wildlife Acts || BoCCI - Red List
Yellowhammer (Emberiza citrinella)	2	31/12/2011	Wildlife Acts || BoCCI - Red List
Mammals			
European Otter (Lutra lutra)	2	10/06/1980	EU Habitats Directive - Annex II & Annex IV || Wildlife Acts
Eurasian Badger (Meles meles)	2	14/05/1992	Wildlife Acts

5 Field Survey

5.1 Survey Personal

John Curtin is an experienced ecologist having conducted plant, habitats, birds, bats and mammal surveys since 2010 including at windfarm and solar sites. John conducted bird, bat and badger surveys. Shane O'Neill is an experienced ornithologist (Co-author Hen Harrier Survey, NPWS 2015) with a broad knowledge of breeding birds, waders and all aspects of ornithology. Shane has previously conducted I-WeBS surveys and taken part in the Shannon estuary wintering wader surveys. Karolina Illien M.S.c has a range of ecological experience surveying birds including waterbirds counts and development sites, bats and habitats. Karolina conducted bat surveys on site.

5.2 Baseline surveys

Table 5-1 provides a summary of surveys conducted within and surrounding the site.

Table 5-1 Summary of survey dates

Date	Survey type	Location	Start Time	End Time	Details	Sunset / sunrise	Surveyor
29/11/2022	Thermal transect	T1	06:50	07:22	Thermal transect of tilled field. 2 x black headed guls noted in field with 16 golden plover recorded in field within boundary	08:22	JC
	VP	1	07:22	10:22	By sheds. Overall low level of activity, highlight being 8 x Lapwing circling around rear of site		
	Hinterland		11:00	13:40	Black headed gulls in fields to SE		
	Transects	T2	13:40	14:10	Northern field. Nothing to highlight		
	Hinterland		14:10	15:00	Low activity by Grand Canal		
15/12/20022	Hinterland		09:00	13:30		16:06	SON
	Transect	2	14:00	14:41	Common species observed		
	Vantage Point watches	1	14:45	17:45	9 x Lapwing recorded perched within field in subject site. 7 x Golden plover also landed and perched in field		
	Thermal transect	1	17:45	18:30	Lapwing x 9 roosting overnight in southern field . 4 x Sn also recorded here.		
20/01/2023	2 Vantage Point watches	1	08:10	14:40	Golden Plover were the most numerous birds recorded on sight during VP a total of 9 flocks were recorded numbering from 1 to 169 these flocks were recorded both on and off the site. Snipe were also recorded 4 in total.	08:27	SON
25/01/2023	Transects	2	14:45	16:00	Transects of the rough pasture to the north of the site were carried in the afternoon only common species were recorded.	16:55	SON

Date	Survey type	Location	Start Time	End Time	Details	Sunset / sunrise	Surveyor
25/01/2023	Thermal transect	1	17:30	18:40	There was a total of 32 Golden Plover recorded during this survey. Snipe and Lapwing were heard but not seen.		
22/02/2023	Preliminary inspection of buildings and trees for bat roosts				Four farm buildings located to west of site. 3 medium potential and 1 of low potential to host a bat roost.		SON
22/02/2023	Badger transect				No evidence of badger was recorded		
24/02/2023	2 Vantage Point watches	2	08:00	14:30	In February Golden Plover were the most numerous birds recorded on site with 6 flocks recorded from 30 to 400 birds.		SON
28/03/2023	2 Vantage Point watches	2	14:00	20:30	March saw a significant drop-off in Golden Plover no flocks were recorded on or near the site on this date. Only common species were recorded.		SON
26/05/2023 – 06/06/2023	Static bat survey. 2 statics; 1 placed in				4 bat species identified over the course of 12 nights.		KI
06/06/2023	Emergence bat survey		21:17	23:20	Two surveyors conducted emergence surveys at sheds to west of site. No roosting bats found.	21:47	JC & KI
06/06/2023	Transect		23:20	00:17	Transect through site and to Grand Canal.		
07/06/2023	Re-entry bat survey		02:58	04:58	Re-entry survey by derelict dwelling to west of site.	04:58	

5.3 Limitations of Survey

All of the surveys were carried out in good weather conditions. Migratory bird surveys would normally include an October survey however due to the late appointment of Eire Ecology, this survey was not carried out, however most of the autumn and spring migratory period was covered.

The location of the bird Vantage point (VP) was chosen as it provided the optimum visibility of the study site. The Vantage point surveys was conducted outside the site. Bat surveys were carried out within the bat active season while evidence of badger was sought in February, before bramble obstructed view. 1

5.4 FAUNA

5.4.1 Bats

There are nine resident bat species in Ireland accounting for nearly a third of Irelands mammal populations. Bats are protected by EU Habitats Directive as well as the 1976 Wildlife Act and 2000 Amendment (BCI, 2010). Lesser Horseshoe bats have an additional protection under the EU Habitats Directive. In order to comply with legislation that bats are not killed or

injured, it is essential to ensure that measures to reduce risk to bats are undertaken or that the presence of bats can be ruled out.

A preliminary walkover survey was carried out by John Curtin on the 22nd of February 2023 to examine the potential for any features suitable to host a bat roost. Buildings to the west were assessed as even if they were not demolished as part of the development; the development could impact roosting bats should they be found here. Three sheds were ranked moderate for bat roosting potential while another was ranked low potential. Hedgerows within the site have no potential to host a bat roost. A tree located just outside the boundary also had no potential.

To ascertain bat activity on a static detector survey was conducted on site from the 26th of May to the 06th of June 2023. A night time detector emergence survey was conducted at sheds and to the west of the site while a dawn survey was conducted at a derelict house further west.

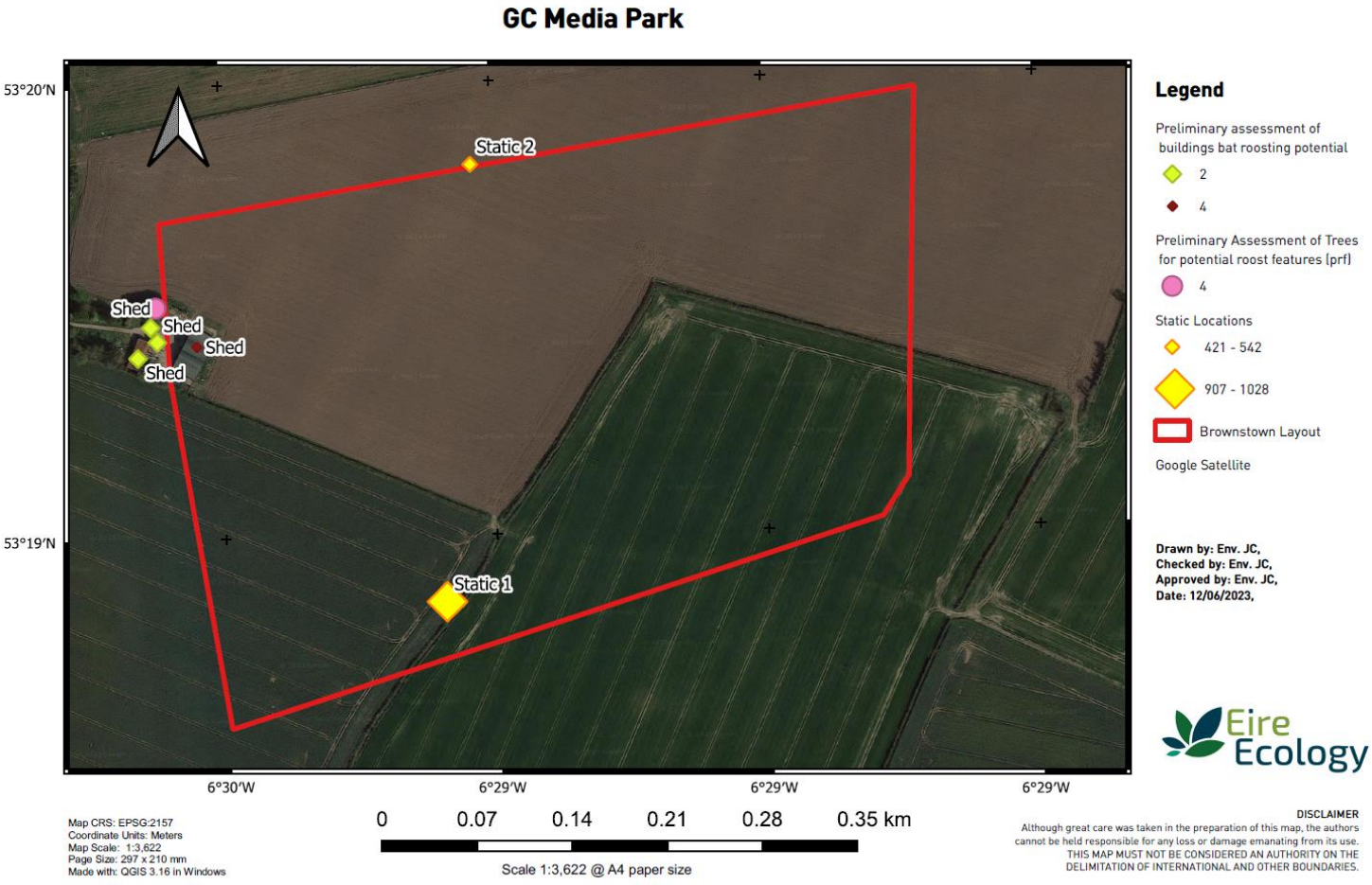

Figure 5-1: Preliminary assessment of trees and buildings within the site alongside locations of static detectors (size of detectors displays difference in activity levels between hedgerow and open habitats).

5.4.1.1 Fixed site recordings made during 2023

Two Song Meter Mini (Wildlife Acoustics, Inc; Massachusetts, USA) 16-bit full spectrum time-expansion recording bat detectors were placed within the study area (Static 1; 53.32155941, -6.48957151. Static 2; 53.32443145, -6.48921833) on the evening of the 26th of May to the 06th of June 2023. These static detectors were installed according to the guidelines as set out in Bat Conservation Ireland's 'Bat Survey Guidelines.'

Detector 1 was placed adjacent to a hedgerow; a habitat feature favoured by bats while the 2nd detector was placed in the open. These devices were set to record from 30 minutes prior to sunset to half an hour after sunrise and automatically adjusts itself each day thus in position and recording giving a total of 101 hours 05 minutes each over the twelve nights.

Registrations as described below follow the Bat Conservation Trusts definition of a bat pass; 'two or more bat calls in a continuous sequence; each sequence or pass is separated by one second or more in which no calls are recorded. The number of bat passes for each species or species group identified is counted for each' point. (BCT Good Practice Guidelines 2nd Ed 2012). Detectors were in place during the peak bat active season.. Weather information is provided by Met Eireann from the weather station located in Dublin Airport. Lowest sunset temperatures was 10 degrees or above. Sunset windspeeds were on average 6.4 mph (2.8m/s). Rainfall was low baring rain on the 03rd. Overall, these conditions were good for bat activity.

5.4.1.2 Emergence bat survey 6th of June 2023

A dusk mobile detector survey was carried out within the site during the dusk period to survey for emerging bats. Surveys commenced at 21:27; half an hour before sunset. Each contact with a bat was recorded. Where possible, a positive identification to species level was made. Information on the behavior was also recorded where available.

The bat detectors used during the walked surveys were Wildlife Acoustics Inc. (Massachusetts, USA) Echo Meter Touch Pro 2 bat detector which is triggered to record when a bat call is emitted louder than 18dB for 1sec. These detectors use full spectrum sampling; detecting all frequencies simultaneously, meaning that multiple bat calls can be recorded at the same time.

In addition to the bat detector one surveyor used a Track IR Pro 19mm thermal imaging scope while the other used a Canon XA10 night vision camcorder supplemented with two nightfox IR torches. Video footage was analysed using Motion Meerkat alongside manual verification.

A contact as shown below describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Some observations contain multiple bats. When several bats of the same species are encountered together, they are recorded under the one contact. A separate contact is recorded for each species. A contact finishes when the recorder assumes the bat is no longer

present. It is likely that the same bat is recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity; the amount of use bats makes of an area / feature. The survey followed the guidelines as set out in bat conservation Ireland's 'Bat Survey Guidelines'.

Sunset on the 06th of June occurred at 21:47. A northwest wind of 0.8m/s was recorded through the survey. The air temperature was recorded as 13.5 degrees at 21:17 dropping to 7.5 degrees by 00:20. Overall, these conditions were good for bat survey work.

5.4.1.3 Results of dusk survey

During the survey, two bat species were identified to species level; Common Pipistrelle (*Pipistrellus pipistrellus*) and Leisler's bat (*Nyctalus leisleri*) were recorded during the emergence periods. During the transect survey Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Brown Long-eared (*Plecotus auritus*) were recorded by the grand canal to the north of the site.

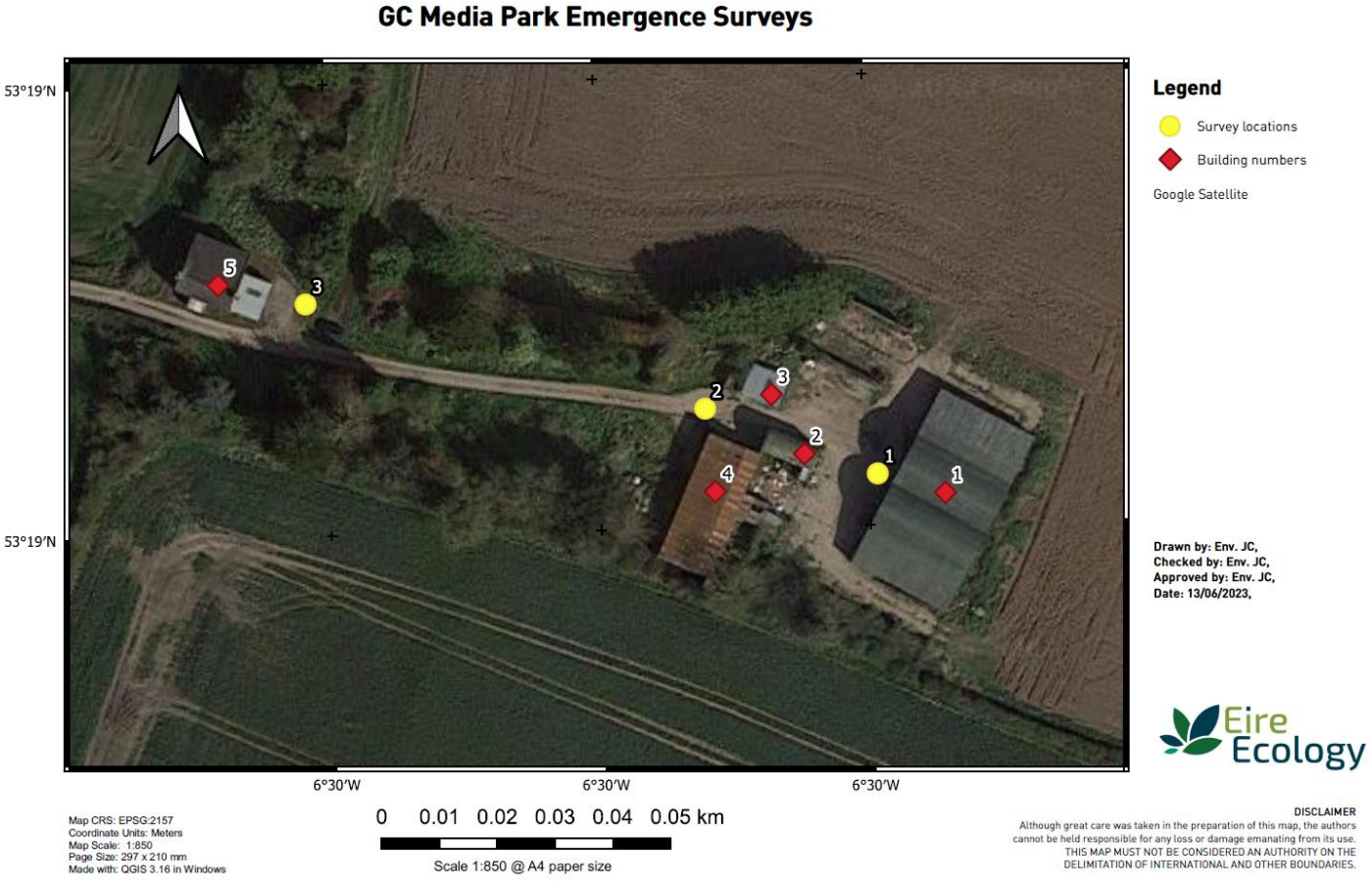

Figure 5-2: Location of sheds and position of surveyors.

At dusk surveyors were positioned by sheds 1 to 4 using torches thermal and night vision camcorder. No bats were recorded emerging from any shed. The first bat recorded was at 22:22 some 35 minutes after sunset when a brief unseen Common Pipistrelle was recorded. Surveyor 2's first contact was recorded at 22:39; 52 minutes after sunset. After this point a couple of contacts were recorded from Common Pipistrelle and Leisler's bat. At 22:48 a

Common Pipistrelle was noted entering and flying within the large metal shed 1. This bat was hunting rather than roosting.

Plate 5-1: Emergence survey location 1. Shed 2 to right, shed 4 to left.

Plate 5-2: Emergence survey location 2 by shed 3

Plate 5-3: Re-entry survey building 5 (location3)

At 23:20 a transect was conducted through thew site and north to the grand canal. Activity was low with no records of Daubenton's. A Brown Long-eared bat and Soprano Pipistrelle were recorded. A dawn survey (02:58 to 04:58) was conducted by a derelict dwelling to the west

(building 5). Common Pipistrelle and Leisler's bat were again recorded, however no roosting bats were found.

5.4.1.4 Results of static bat survey 2023

Analysis of recorded registrations was made using Wildlife Acoustic's Kaleidoscope Pro; version 5.6.0c This software identifies many of the calls made by Irish bats. All calls not labelled Soprano or Common Pipistrelle Bats were also manually verified.

The results of the static detector survey are summarised in **Table 5-2.** Over the course of twelve nights a total of 1449 registrations were recorded from both detectors.

Detector 2's highest-level activity on the first night, which saw 94 individual calls recorded. Detector 1 showed a marked higher average rate of bat calls, peaking at 109 between the 28th and 31st May. Leisler bats made up the majority of the calls recorded, most likely due to being located in open spaces. Lowest activity occurred on the 6th of June with 10 registrations from detector 1 and 1 registration recorded on detector 2.

Of particular interest is the lack of Myotis recordings given the site is located relatively close to the Grand Canal. Results indicate that lands within the site outline are not utilised by Daubenton's bats or other woodland bat species that may be using the canal corridor.

Table 5-2: Summary of both statics

Detector	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Unidentified Myotis	Total	Minutes recorded	Bat passes per hour
1	947	43	16	19	3	0	1028	6065	10.2
2	386	23	7	4	0	1	421	6065	4.2
Total	1333	66	23	23	3	1	1449	12130	7.2
Bat passes per hour	6.6	0.3	0.1	0.1	0.0	0.0			

5.4.1.5 Bat Discussion

Four species of bat were positively identified during the various bat surveys: Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared bat (*Plecotus auritus*) and Leisler's bat (*Nyctalus leisleri*). In addition, several unidentified Myotis bat species were recorded, these being either Whiskered, Natterers or Daubenton's bats. Finally several Pipistrelle calls recorded from the static detectors had a peak frequency of 40kHz thus could be either Common or Nathusius Pipistrelle.

An emergence survey conducted at buildings to the west of the site showed no evidence of roosting bats and a preliminary assessment of trees showed no trees within the site suitable for hosting a bat roost.

The development of the site is unlikely to impact the local bat population given the low levels of activity recorded.

5.4.2 Badgers

Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal.

In order to ascertain if badgers were using the site and surrounding area, a preliminary walkover survey was carried on the 22nd February 2023. Evidence such as sett, trails with hair evidence, latrines or snuffle holes were sought. No evidence of badgers were found.

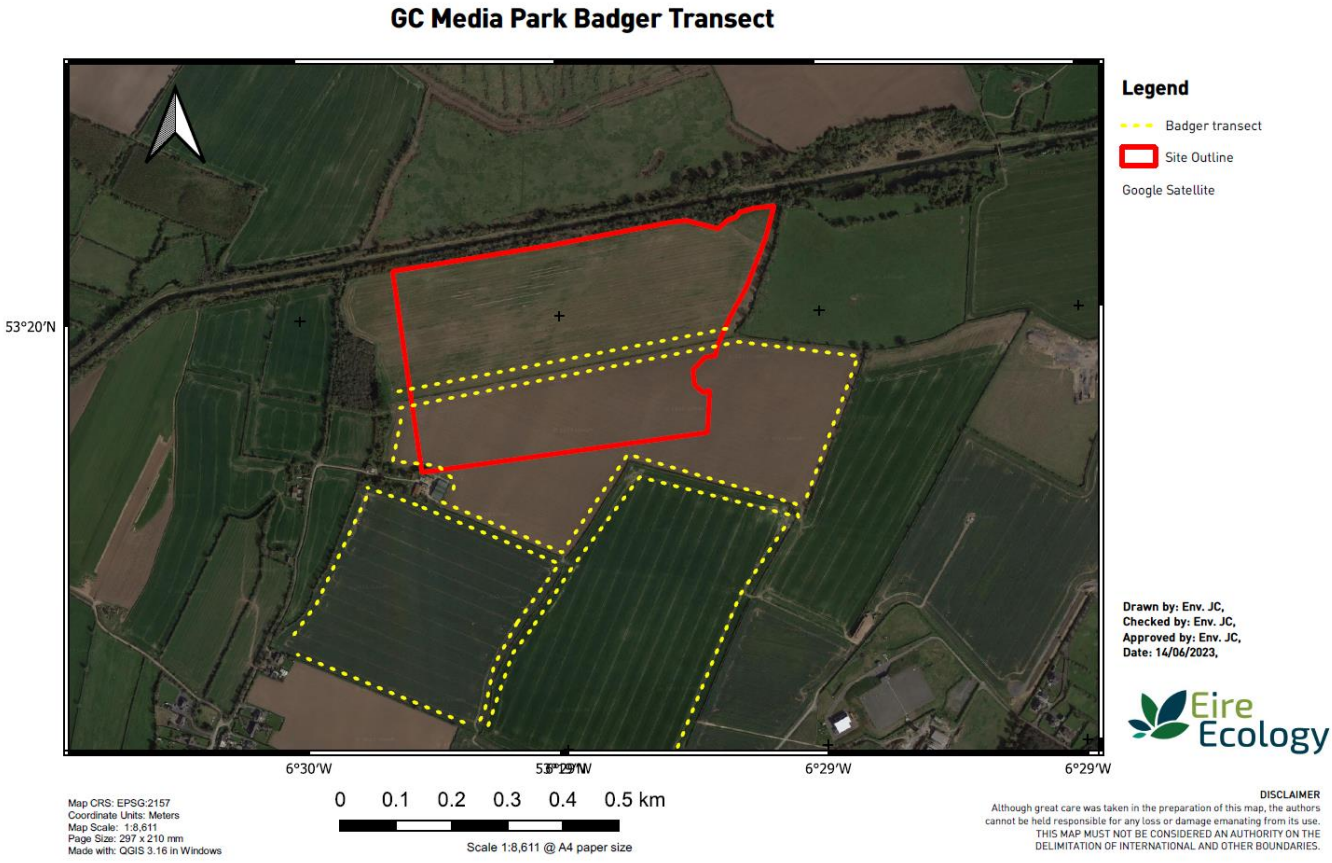

Figure 5-3: Badger transects

5.4.3 Birds

All species of birds are protected under the Wild life Act 1976/Wild life Amendment Act 2000. Every autumn and spring several billions of birds undergo migratory journeys between their breeding and non-breeding grounds. These migratory movements link ecosystems and biodiversity on a global scale and their protection require international efforts. The impact of direct anthropogenic changes, including light pollution that reroutes migrants and collisions with manmade structures cause fatalities (Nussbaumer, 2019). In order to ascertain if the proposed site is used as a wintering or migration route either during the main migratory period or as a commuter route between feeding and roosting sites, bird surveys were conducted from November 2022 to March 2023.

Six days of Vantage point (VP) surveys and transects were conducted on the site. In addition, to better understand the relationship between the site and the surrounding areas, hinterland point counts were conducted in the surrounding area between November 2022 and March 2023. Target species for the surveys included all migratory birds such as swans and geese given the close proximity to peatland (possible roosting site) and grassland as these species graze on grass. In addition, birds of prey, ducks, plovers, lapwings, sandpipers, gulls and terns. For the purposes of the survey raptors were also considered to be target species. In line with I-WeBS methodology, Cormorant, Shag, Little Egret, Grey Heron, and Kingfisher were also included (Lewis L. J., 2017).

To further support the survey effort three thermal imaging night time transects were conducted to identify birds roosting within the site. These surveys took guidance from the methodologies described in Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods, the Scottish Natural Heritage 'Recommended bird survey methods to inform impact assessment of onshore wind farms 2014' and Wild birds: surveys and monitoring for onshore wind farms - GOV.UK (www.gov.uk).

5.4.3.1 Thermal imaging

Thermal imaging is a method for observing how birds use habitats at night, as watching those behaviours is difficult in low light environments. *The circumstances in which a nocturnal survey might be required, and indeed the specific methodology, should be informed by the behaviour of priority species, and habitats present, on a survey site. For example: During non-breeding surveys on arable land, where inland wintering waders (golden plover, woodcock, redshank, curlew etc.) have been recorded on the land, either as part of survey efforts or as identified at desk study; In areas where migratory geese are likely to roost and forage in arable fields overnight, for example, pink-footed geese in the Northwest of England, or barnacle geese in parts of Scotland etc.* (https://birdsurveyguidelines.org/)

Table 5-3 Elements of the following guidelines were used to decide survey methods

Type of survey	Reference/ Source
Vantage point survey	**Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods - a Manual of Techniques for Key UK Species. RSPB: Sandy.**
VP survey is designed to quantify the level of flight activity and its distribution over the survey area. Its primary purpose is to provide input data for the Collision Risk Model (Band et al. 2007), which predicts mortalities from collision with turbines. Data can also be used to provide an overview of bird usage of the site, which may help to inform an overview of potential disturbance and displacement. Where new above-ground grid connections are planned, the proposed connection route should be covered by VP observations to assess potential collision risk. We recommend a minimum of 72 hours per VP location divided between seasons (36 hours breeding and 36 hours non-breeding) per year, as a standard for species where vantage point survey is required	
Type of survey	**Reference/ Source**
WeBS	**Wild birds: surveys and monitoring for onshore wind farms - GOV.UK (www.gov.uk)**
Important movements of birds can take place at any time of year but usually you should survey from: • March to July for breeding birds • November to March for wintering birds • March and October for passage birds	
Type of survey	**Reference/ Source**
Wintering and migratory waterfowl	**Scottish Natural Heritage - Recommended bird survey methods to inform impact assessment of onshore wind farms**
Disturbance or displacement to wintering and migrant waterfowl can occur on both roost sites and feeding areas, so surveys for both of these should be considered. In addition, searching the survey area for signs of wildfowl presence (counts of droppings) can help determine if feeding birds are using the site by night or on days previous to survey visits. The spring migration, period is defined as March – mid-May but this will vary depending on species and location. The autumn migration period is defined as September – November but again varies with species.	

A Leica Trinovid 10 x 42 HD binoculars and Leica televid 77 20-60x 80mm spotting scope were used to scan the vantage area. Particular attention was focused on species such as waders, waterbirds, gulls, raptors, and red listed species. Flight lines were drawn for these. Other species observed were noted as present. In addition, point counts and hinterland surveys were conducted on the same dates, as well as an examination of pitches of proposed development searching for geese droppings. The hinterland surveys were conducted throughout the surrounding area, focusing on open tillage fields, lakes and canals.

Vantage point surveys were conducted at 53.323277, -6.492279 from a mound of soil located to the east of the subject site. Give the flat nature of the topography, this mound provided the best viewshed of the site. Bird surveys were conducted by John Curtin (B.Sc.) and Shane O'Neill. John is the principal ecologist for Eire Ecologist and has been conducting bird surveys since 2013. Shane has been conducting bird surveys since 2012 including Shannon estuary wintering wader surveys.

5.4.3.2 Birds within the site of the proposed development

The site of the proposed development consists of tillage, hedgerows and built land.

Species of note found within the site include Black-headed Gull, Buzzard, Golden Plover, Great Black-backed Gull, Herring Gull, Kestrel, Meadow Pipit, Mew Gull, Northern Lapwing, Redwing and Snipe.

5.4.3.3 Vantage Point Results

Five vantage point surveys were conducted between November 2022 and March 2023. The development site has an area of 18.4ha.

Table 5-4 summaries results from the transect surveys showing no of times species were observed and highest numbers recorded. Flocks of Golden Plover were noted on 15 occasions from 4 surveys with highest flock recorded at 169 individuals within the site and 400 just outside to the south. This species was observed perched on the ground feeding. Lower numbers of Lapwing were also recorded (peaking at 9). Mute swan, cormorant and mallard were observed flying along the canal and not associating themselves with the subject site. Gulls were typically observed overflying the site. Snipe were observed twice, flushed by hunters. Redwing; a red listed wintering passerine were noted on one occasion from the VP surveys. No flocks of numbers equating to national importance were recorded.

Table 5-4: Species list of target species recorded from VP

Species	BOCCI4[1]	Number of observations	Highest numbers observed	1% National Population	Nationally Important numbers?
Buzzard	Green	7	2	Unknown	-
Cormorant	Green	2	1*	110	No
Golden Plover	**Red**	**16**	**400**	**920**	**No**
Great Black-backed Gull	Red	3	25	Unknown	-
Grey Heron	Green	1	1*	25	
Herring Gull	Green	4	24	Unknown	-
Kestrel	Red	3	2	Unknown	-
Mallard	Amber	1	2*	280	No
Mew Gull	Green	1	2	Unknown	-
Mute Swan	Amber	2	1*	90	No
Northern Lapwing	Red	5	9	850	No
Redwing	Red	1	22	Unknown	-
Snipe	Red	2	2	Unknown	-

Table 5-5: Species list of non-target species recorded from VP.

Species	BOCCI4	Sum of sightings
Blackbird	Green	11
Dunnock	Green	2
Fieldfare	Green	15
Hooded Crow	Green	18
Jackdaw	Green	37

[1] Birds of Conservation Concern 2020 - 2026

Species	BOCCI4	Sum of sightings
Jay	Green	2
Magpie	Green	11
Marsh Tit	Green	2
Meadow Pipit	Red	7
Pheasant	Green	1
Raven	Green	6
Robin	Green	3
Rook	Green	78
Sky Lark	Green	6
Song Thrush	Green	1
Stonechat	Green	2
Winter Wren	Green	5
Wood Pigeon	Green	45

5.4.3.4 Daylight Transect Survey

Daylight transects were conducted within and surrounding the site on three occasions; 29th November, 15th December 2022 and 25th January 2023. Species of interest recorded included Black headed gull (max 2 observed), Buzzard, Golden Plover (max 37 observed), Meadow Pipit (max 14 observed) and a snipe.

5.4.3.5 Thermal Survey

Night-time thermal surveys were conducted on the 29th of November, 15th of December 2022 and 25th of January 2023 using a Track IR Pro 19mm thermal imaging scope. On the first survey 2 x Black headed guls were recorded roosting within the site while 9 Golden plover were found in a field to the south of the site (outside the site boundary). The second survey showed 9 Lapwing and 4 Snipe roosting while the final survey recorded 30 Golden plover while snipe and lapwing were heard but not seen. Table 5-6 provides a summary of results from all transect surveys.

Table 5-6: Species of interest recorded during all transect surveys

Species	Highest numbers observed	Number of observations	Highest numbers observed	Number of observations
	Within site boundary		Outside site but within 300m	
Black-headed Gull	2	2	-	-
Buzzard	1	2	-	-
Golden Plover	37	2	30	3
Meadow Pipit	14	5	-	-
Northern Lapwing	9	2	-	-
Redwing	2	1	-	-
Snipe	4	3	4	2

Table 5-7: Species list from transect surveys

Species	
Blackbird	Northern Lapwing
Black-headed Gull	Redwing

Buzzard	Reed Bunting
Dunnock	Rook
Fieldfare	Sky Lark
Golden Plover	Snipe
Goldfinch	Song Thrush
Greenfinch	Starling
Hooded Crow	Stonechat
Jackdaw	Winter Wren
Jay	Wood Pigeon
Meadow Pipit	

Plate 5-4: Golden Plover recorded 25th of January 2023

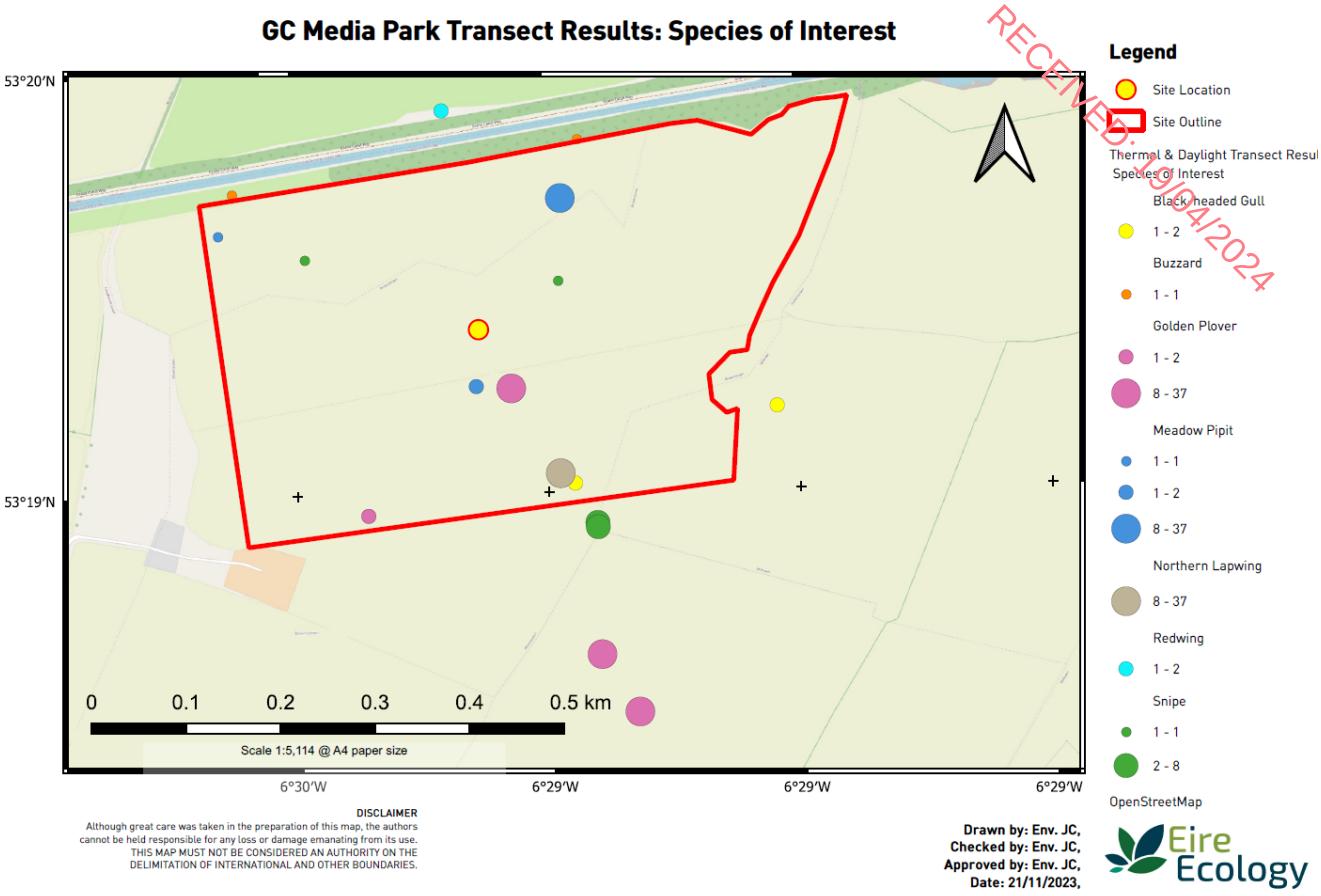

Figure 5-4: Species of interest recorded during transect surveys. Size of point represents flock size.

5.4.3.6 Hinterland Results

Table 5-7 provides a summary of results from the hinterland surveys. Numerous species of interest were recorded from the surrounding pasture, the artificial lake located within the Grange Castle Business Park located to the north-east of the site and along the Grand Canal. No nationally important flocks were recorded.

Table 5-8 Summary of Hinterland surveys

Species	Times observed	BOCCI4	Season	Max No. Obs	1% National Population	Nationally Important numbers?
Black-headed Gull	5	Amber	Breeding/Wintering	150	Unknown	-
Buzzard	3	Green	N/A	1	Unknown	-
Coot	4	Amber	Breeding/Wintering	35	190	No
Golden Plover	2	Red	Breeding/Wintering	400	920	No
Great Cormorant	2	Green	N/A	8	110	No
Herring Gull	4	Green	N/A	70	Unknown	-
Kestrel	1	Red	Breeding	0	Unknown	-
Little Grebe	2	Green	N/A	10	20	-

Species	Times observed	BOCCI4	Season	Max No. Obs	1% National Population	Nationally Important numbers?
Mallard	4	Amber	Breeding/Wintering	43	280	
Mew Gull	1	Green	N/A	50	Unknown	-
Moorhen	2	Green	N/A	3	Unknown	-
Mute Swan	4	Amber	Breeding/Wintering	12	90	No
Northern Lapwing	2	Red	Breeding/Wintering	165	850	No
Redwing	2	Red	Wintering	23	Unknown	-
Shag	1	Red	Wintering	2	Unknown	-
Snipe	1	Red	Breeding/Wintering	1	Unknown	-
Teal	1	Amber	Breeding/Wintering	30	360	No
Tufted Duck	2	Amber	Breeding/Wintering	5	270	No

Figure 5-6 below shows the locations where species of interest were noted within the hinterland. Grassland / tillage to the south of the site showed good numbers of species of interest alongside the artificial lake located within the Grange Castle Business Park.

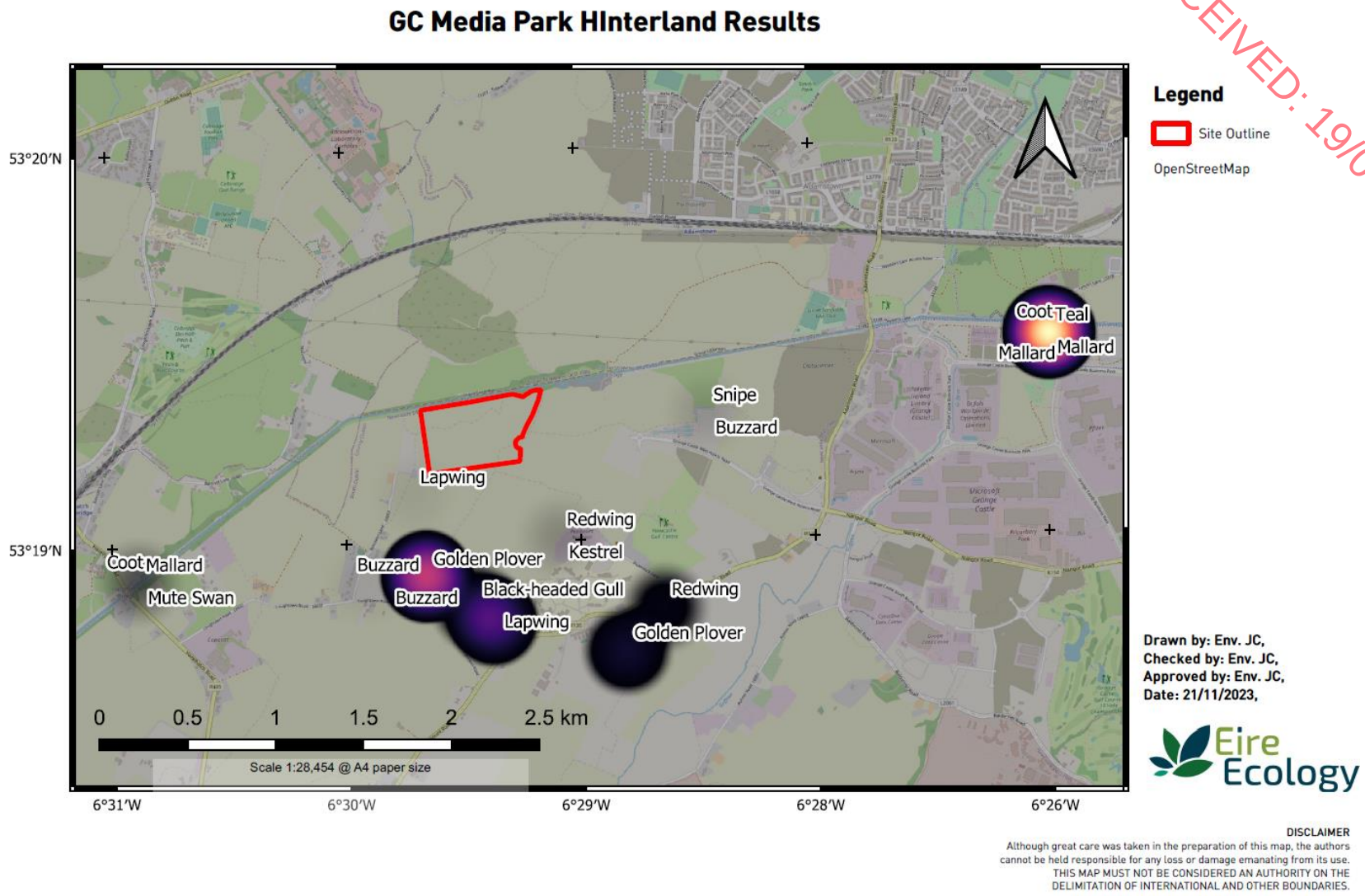

Figure 5-5: Heat map of hinterland. Artificial ponds within Grange Castle Business Park to the NE showed highest numbers

5.4.3.7 Summary per species

The following sections provides a summary of all sightings from across the various surveys related to species of interest. Further details can be found in Appendix 1.

5.4.3.7.1 Buzzard

Buzzard is a widespread bird of prey best adapted to hunt over lowland pasture. Buzzard was seen on 8 occasions hunting within or adjacent to the site and in the hinterland. This species nests in treelines. The site does not contain suitable breeding habitat but the surrounds are highly suitable.

5.4.3.7.2 Golden plover

Large flocks of Golden plover overwinter in Ireland before returning to Iceland to breed. These can be found in a variety of habitats including coastal and inland and are often associated with wetlands as well as tilled fields. In addition, Ireland hosts a small breeding population limited to the acidic uplands of NW counties.

(S. Gillings, 1999) states this species avoids lands over 200m in winter and have a preference for winter cereals, bare till and grassland with a sward height of 7cm or less. They are also renown for cold weather movements, likely moving towards the coast during cold snaps to avoid frozen ground. (Gilling, 2007) found that Golden plover tend to ignore seemingly suitable lands more than Lapwing and can often be found repeatedly utilising the same fields in preference to other similar fields.

The closest SPA with Golden Plover as a Conservation Objective is Bull Island SPA located 20.3km to the east. Iwebs data collating high tide counts for waterbirds from the Bull Island areas shows this species has highly variable counts thus does not remain at the SPA regularly but avails of surrounding terrestrial habitats. The peak count from the seven subsites surrounding Bull Island varied from 7548 total in 2018/2019 to a low of 35 in 2021/2022. In addition to the coastal sites, Golden plover can be found to the west, with a small breeding population located in the Curragh and wintering flocks in the wider Kildare area. Wintering surveys conducted in grasslands at Clonburris, 3.5km to the east did not find Golden Plover. This is unsurprising as the grasslands here are rank and typically over 7cm in sward height thus unfavourable for this species.

Highest numbers of this species observed within the site was 169 (feeding during daylight) with smaller numbers roosting at night (max. 37). Highest numbers (400) were observed during hinterland surveys in fields to the south of the site. Figure 5-6 below shows all sightings of Golden Plover form VP and transect surveys, with the majority of recordings taking place to the south of the site.

The subject site is situated within a block of land under the South Dublin County Council ownership with other developments either proposed or at planning stage. Additional bird

surveys conducted in the overall landholding have also been conducted from February 2023 and are still ongoing. These surveys show Golden plover regularly using the overall landbank during the winter months particularly from November to March with peak flock observations of 560 observed to the west of the site. This species utilises winter grain fields for feeding and roosting, in this location favouring grain tillage. The 2023 winter crop for much of the site is potatoes, thus may negatively impact on numbers however preliminary findings from November 2023 showed a peak of 300 birds circling the site.

The most favoured fields within the overall landbank lies outside the Media Park site to the south.

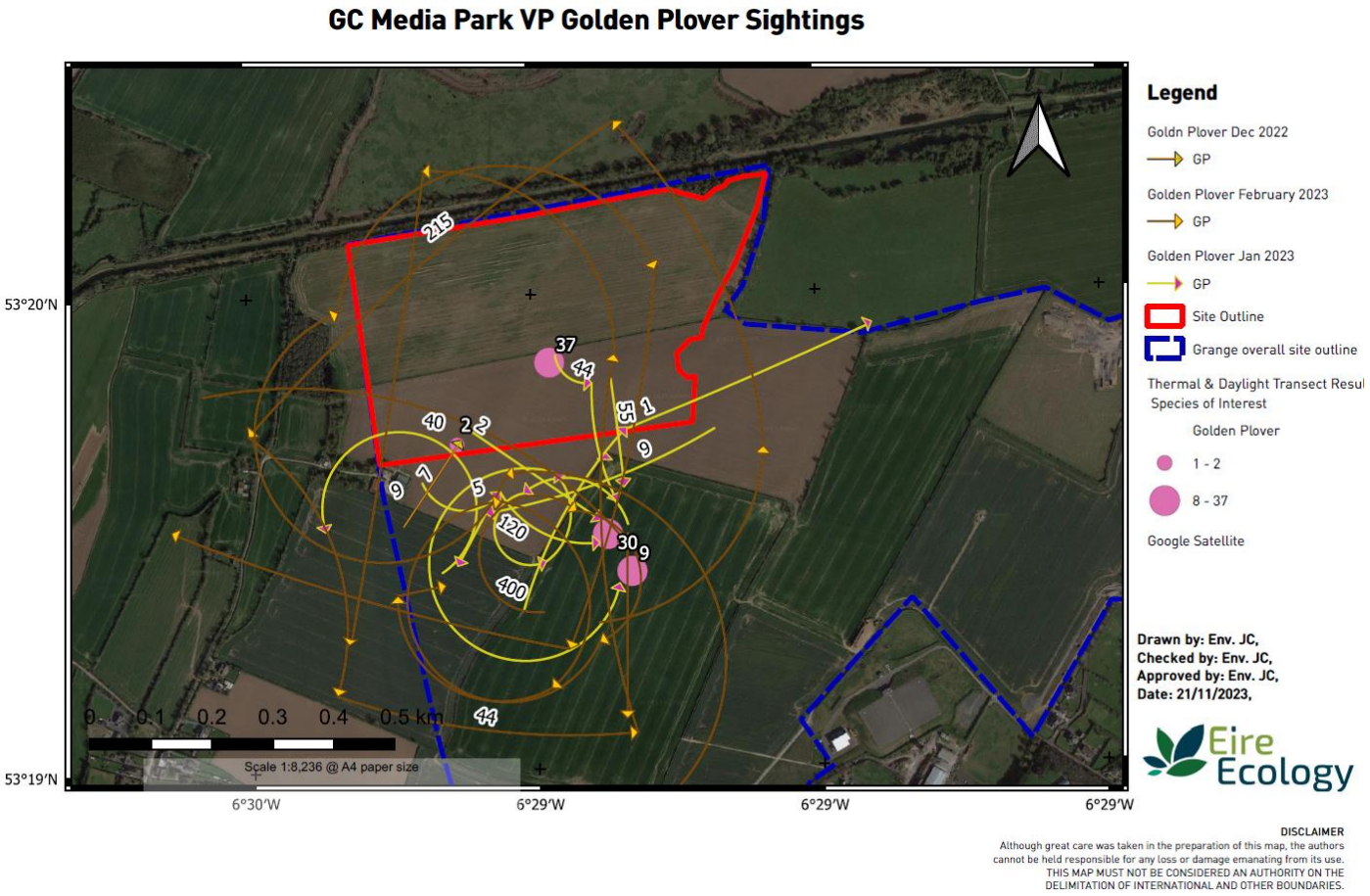

Figure 5-6: All Golden Plover sightings

5.4.3.7.3 Gulls

Black-headed Gull is our most widespread and numerous wintering gull, being found regularly on inland and coastal wetlands throughout the winter. Based on colour-ring resightings, the Irish wintering population is likely comprised of a mix of Irish-breeding birds as well as individuals from the UK, Scandinavia and Baltic states (Wernham et al., 2002). Most Irish-breeding Black-headed Gull remain here throughout the year but a small proportion of predominantly juvenile birds move south to Europe or north Africa (Wernham et al., 2002; McGreal, 2014). (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16., 2019). A single sighting of two black-headed Gulls were observed during a

night time transect within the site. This species was observed more frequently in the hinterland, particularly on improved grass with 150 being highest numbers observed.

Three sightings of Great Black Backed gulls were noted from VP surveys with highest numbers recorded being 25. All observations were of flying birds. This species did not interact with the site.

Herring gull was recorded both within and outside the site. All hinterland sightings were from the ponds at GC Business park. VP sightings were from birds overflying. This species did not interact with the site.

Mew or Common gull once within the site (2 birds overflying) and once in the hinterland (50 birds feeding by the pond at GC Business Park). This species did not interact with the site.

5.4.3.7.4 Grey Heron

The grey plumage and stature of Grey Herons make them unmistakable. It is a very familiar species being widely distributed and a year-round resident in Ireland. Resident in Ireland, wintering numbers are augmented by birds moving in from the north and east (Wernham et al., 2002). Grey Heron numbers have shown a gradually increasing trend throughout I-WeBS. Widely distributed in Ireland, Grey Heron are found in a variety of freshwater wetlands as well as estuaries and rocky shores. (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16, 2019). Grey Heron was seen once during surveys, flying along parallel to the Grand Canal. This species did not interact with the site.

5.4.3.7.5 Kestrel

Similar to Buzzard, several observations of Kestrel were made during vantage point and walkover surveys. Birdwatch Irelands publication; *''Countryside Bird Survey: Status and Trends of Common and Widespread Breeding Birds 1998-2016"* states the kestrel population was estimated at 13,500, a decrease of 44.9% over the 18-year period, 1998-2016 and a 22.1% decrease in distribution over the 25-year period 1991-2016. Kestrel are a BoCCI red listed species. 3 observations of kestrel were found from within the site alongside another in the hinterland. Kestrel were observed hunting and on the 28th of March a pair were observed circling together. This species nests in treelines and woodland (previously a ground nesting bird). The site does not contain suitable breeding habitat but the surrounds are suitable.

5.4.3.7.6 Mallard

Mallard are the most widespread species, although not quite as numerous as Wigeon or Teal. They occur in almost all available wetland habitats in Ireland. Mallard that occur in Ireland belong to the population that breed across northern Europe and these have a non-breeding range that extends across north-west Europe, east to the Baltic. This population is stable (Wetlands International, 2018). Irish-breeding birds are resident, and are augmented each winter by migrants, possibly some from the Icelandic breeding population (Wernham et al.,

2002). Numbers of Mallard have declined throughout I-WeBS, as well as in Northern Ireland and Britain. Frost et al. (2018) suggest that the declines in wintering Mallard could be related to fewer releases by shooting estates and/or perhaps short-stopping by Russian birds. (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16, 2019) Mallard were observed on four occasions by ponds within the GC business park. A pair were noted flying parallel to the Grand Canal also. This species did not interact with the site.

5.4.3.7.7 Mute Swan

During the winter period swan species graze on grassland and typically roost in peatland and lakes. They regularly use the same grazing lands over multiple years and can be seen flying the same route between feeding and roosting grounds each dusk and dawn. During the breeding season mute swans can be found breeding on wetlands.

Two sighting of Mute swan were recorded during onsite surveys flying along the Grand Canal. In addition this species was also observed by the pond at the GC Business park. **No grazing swans (Whooper, Bewick's or Mute) was recorded within the site from any survey.**

Given the low levels of activity noted from the site, no loss of swan grazing or roosting land is predicted from the proposed development.

5.4.3.7.8 Lapwing

The lapwing population of Ireland contains residents, summer and winter visitors. Large flocks overwinter in Ireland on wetlands and wet pasture throughout the country. A smaller breeding population can be found ground-nesting on grass particularly by wet grassland. Given the reduction of this habitat over time the species has started to utilise peatland habitats as a breeding site alternative. In Ireland, this wader has shown a decline overall throughout I-WeBS; consistent with both Britain and Northern Ireland (Frost et al., 2018). Lapwing are sensitive to severe winters, and movements IWM 106 (2019) Irish Wetland Bird Survey 2009/10 – 2015/16 118 westward from northern Europe into Britain and Ireland, and south to France and Iberia during particularly cold periods are known (Wernham et al., 2002). Furthermore, a relatively large proportion of Lapwing are known to spend winter away from coastal wetlands, often in non-wetland habitats such as agricultural land. Therefore, this species is considered poorly monitored by wetland waterbird monitoring methods and assigning accurate national estimates of wintering populations is difficult (Delaney et al., 2009). Lapwing was recorded on seven occasions within and adjacent to the site with highest numbers recorded being 9. Given Nationally Important wintering numbers are 850, numbers onsite represent local significance. Within the hinterland, highest number of sightings occurred on the 25th of January 2023 with 165 birds.

5.4.3.7.9 Snipe

Common snipe is a small cryptic wader mostly found in bog, marshy wetland, and rough ground in both upland, lowland regions, and lakeshores. The population trend for Snipe in

Ireland remains uncertain as they are very difficult to monitor and are almost certainly undercounted. They are a skulking species with a widely dispersed distribution, and many remain undetected unless flushed. Snipe were encountered most frequently during transect surveys (both within and surrounding the site). On the 15th December 2022 5 snipe were observed during daylight and night time surveys while on the 25th of January 2023 5 snipe where again observed. A single observation of snipe was also observed during hinterland while hunters flushed two snipe twice during a VP survey.

5.4.3.7.10 Other species

Coot, Little Grebe, Moorhen, Shag, Teal, Tufted Duck were all recorded during hinterland surveys but not onsite while Cormorant was noted twice during VP surveys flying parallel to the Grand Canal and not interacting to the subject site.

5.4.3.8 Significance of Birds

The significance of potential ecological effects on birds was determined using Percival (2003) together with professional judgement. The effects were further described with reference to EPA (2017) and CIEEM (2019) criteria for characterising ecological impacts.

Table 5-9: Criteria for assessing impacts based on CIEEM (2019) and (EPA, 2017)

Parameter	Description
Quality	Positive effect: A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral effect: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative effect: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Extent	The area over which an impact occurs
Duration	• Momentary – effects lasting from seconds to minutes • Brief – effects lasting less than a day • Temporary – effects lasting less than a year • Short-term – effects lasting 1 to 7 years • Medium term – effects lasting 7 to 15 years • Long term – effects lasting 15 to 60 years • Permanent – effects lasting over 60 years • Reversible
Reversibility	Irreversible impacts: permanent changes from which recovery is not possible within a reasonable time scale or for which there is no reasonable chance of action being taken to reverse it. Reversible impact: temporary changes in which spontaneous recovery is possible or for which effective mitigation (avoidance/cancellation/reduction of effect) or compensation (offset/recompense/offer benefit) is possible.
Frequency and Timing	Frequency –How often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Parameter	Description	
	Timing –the timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.	
Describing the significance of effects (EPA, 2017)	Imperceptible	An effect capable of measurement but without significant consequences.
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics

The combination of desk study and the field study has determined that the site in question does not lie within a 15km buffer of any Special Protection Area (SPA) for birds with closest SPA's found 15.1km; Wicklow Mountains SPA; Site Code 004040 (designated for Merlin and Peregrin) and 15.3km Poulaphouca Reservoir SPA; Site Code 004063 (designated for Greylag Goose and Lesser Black-backed gull). None of these species were noted from the subject site.

The site is of ecological value for wintering Golden Plover who can be found within the site and the surrounds in regionally important numbers. The closest designated site for this species is the Bull Island SPA. Determining if the Golden Plover using the site constitute an ex-situ population associated with this SPA is difficult. (SNH, 2016) provides foraging range to a maximum of 11km during the breeding season but does not provide foraging distances for the winter season. An examination of I-WeBS data for the Dublin bay sub-sites surrounding Bull Island shows a lot of variation month to month and year to year for the designated flock suggesting they remain ex-situ for extended periods. Large swathes of similar habitat can be found in the surrounds, particularly to the west with suitable foraging habitat highly limited to the east. As previously stated, survey work is continuing through the 2023/2024 winter season for the overall Grange Castle land bank (encompassing the media park site) with surveys particularly focusing on Golden plover numbers and behaviours not only within the site but also ion the hinterland. Given, the difficulty in assess where the Bull Island Golden Plover flock is at any one time, and following the precautionary approach we consider the Zone of Influence for this development can encompass Bull Island SPA when considering its Conservation Objective; Golden Plover.

Lower numbers of other species of interest can also be found such as wintering Lapwing, snipe, the passerines; redwing and meadow pipit as well as Buzzard and Kestrel; both likely to breed outside the site, within the locality.

5.4.3.8.1 Significance values for birds

Table 5-11 evaluates the importance of species of interest found within and surrounding the site. The table provides a sensitivity value based on (Percivel 2003) although this was designed to examine impacts on birds by wind energy.

Table 5-10 Determination of Sensitivity in study area

Sensitivity	Determining factor
Very High	Species that form the cited interest of SPAs and other statutorily protected nature conservation areas. Cited means mentioned in the citation text for the site as a species for which the site is designated.
High	Species that contribute to the integrity of an SPA but which are not cited as species for which the site is designated. Ecologically sensitive species including the following : divers, common scoter, hen harrier, golden eagle, red-necked phalarope, roseate tern and chough. Species present in nationally important numbers (>1% Irish population)
Medium	Species on Annex 1 of the EC Birds Directive Species present in regionally important numbers (>1% regional (county) population) Other species on BirdWatch Ireland's red list of Birds of Conservation Concern
Low	Any other species of conservation interest, including species on BirdWatch Ireland's amber list of Birds of Conservation Concern not covered above.

Table 5-11 Evaluation of importance for species of interest found interacting with site

Species	Species information	Found within site?	Found in Hinterland surveys?	Designation (BOCCI4)	Sensitivity (Percivel 2003)	Value of overall Grange Castle Landbank	Value of subject site
Buzzard	Green listed in BoCC 2020-2026. Regularly found both within and outside the site. Habitats within the site are not suitable for breeding.	Yes	Yes	Green	Low	Local High	Local
Golden Plover	Red listed species. Following the precautionary approach these birds are considered an ex-situ component of the Bull Island CO flock. While the Media Park site is not the area of lands of highest value for this species within the overall Grange Caste landbank, the species where noted within the site on multiple occasions. Higher numbers found in Hinterland.	Yes	Yes	Red	Very high	Regional	Local High
Kestrel	BoCCI 4: Red listed species. Countryside bird survey shows an overall downward trend since 1998 however the index has trended up since a 2014 low (https://c0cre470.caspio.com/dp/4bae3000b62efcaae08e4f4da8bd). The 2011-2016 population was estimated at 13,500 (Lewis 2019). This species was found to hunt within the site. Given a pair was observed in March it is likely to breed in the locality.	Yes	Yes	Red	Medium	Local High	Local
Meadow Pipit	This species is red-listed on the Birds of conservation concern in Ireland 2020-2026 list (BOCCI). The listing of this species as of high conservation concern is due to a large decline in population following the unusually cold winters of 2009/2010. According to BirdWatch Ireland, the species has undergone a significant recovery since that period (Countryside bird survey data trend showed 2019 with highest peak since index started in 1998. Slight decline occurred from this peak in 2020 and 2021; https://c0cre470.caspio.com/dp/4bae3000b62efcaae08e4f4da8bd) Found occasionally within the site but highest numbers noted within grassland adjacent to Grand Canal (14 birds) where bird crop cover was planted.	Yes	Yes	Red	Medium	Local High	Local
Lapwing	This species is Red listed according to Birds of Conservation Concern in Ireland 2020-2026 and is of high conservation value as a result. The last IUCN Red List assessment, carried out in 2016, notes the Lapwing as a 'Near Threatened' species on a global scale. Additionally, the population was assessed as decreasing. Highest numbers found on site was 9 while a flock of 165 was observed during hinterland surveys.	Yes	Yes	Red	Medium	Local	Local
Redwing	Common winter visitor to Ireland with birds from the Icelandic and Scandinavian breeding populations arriving in October and departing again between mid-March and early-April. Observed within the site on 3 occasions with highest numbers of 23.	Yes	Yes	Red	Medium	Local	Local Low

Species	Species information	Found within site?	Found in Hinterland surveys?	Designation (BOCCI4)	Sensitivity (Percivel 2003)	Value of overall Grange Castle Landbank	Value of subject site
Snipe	This species is Red-listed according to Birds of Conservation Concern in Ireland 2020-2026 and is of high conservation value as a result. Severe declines have been recorded in Snipe breeding and wintering populations in Ireland, resulting in its move to the Red-List in the most recent BoCCI assessment (Gilbert, Stanbury and Lewis, 2021). According to the last IUCN Red List assessment in 2016, the Snipe is a species of 'Least Concern' on a global scale. However, a decreasing global population trend was noted. This ground nesting species finds suitable breeding habitat where there is grassy tussocks within or adjacent to boggy areas. Bogs and wet grassland can be suitable habitat for this species. The habitat on site is suitable for wintering birds however given the intensive agriculture currently in place within the site, breeding snipe are unlikely to be found here. not suitable for this species.	Yes	Yes	Red	Medium	Local	Local Low

6 ASSESSMENT OF IMPACTS

Determination of impacts is derived with guidance from (Percival, 2003). Table 6-1 provides definitions for magnitude of effect. This data alongside the previously assigned significance value is imputed into Table 6-2; significance matrix to provide a final significance impact of the development per species.

Table 6-1 Determination of Magnitude of Effects.

Magnitude	Description
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. Guide: < 20% of population / habitat remains
High	Major loss or major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed. Guide: 20-80% of population/ habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed. Guide: 5-20% of population/ habitat lost
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1-5% of population/ habitat lost
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. Guide: < 1% population/ habitat lost

Table 6-2 Significance matrix

Significance		Sensitivity			
		Very high	**High**	**Medium**	**Low**
Magnitude	**Very High**	Very high	Very high	High	Medium
	High	Very high	Very high	Medium	Low
	Medium	Very high	High	Low	Very Low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

Table 6-3 Impacts on species of interest

Species	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
Badger	Direct Habitat Loss	No evidence of badgers sets or general activity was recorded from the subject site.	No direct habitat loss.	N/A	The magnitude of this impact is assessed as Very Low. Medium sensitivity species (est population of 84,000) + Very Low potential Impact = No likely significant effects at a local level are predicted
	Displacement and barrier effect	Post construction it is unlikely the proposed development will have any impact on the local population.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Buzzard	Direct Habitat Loss	This species was noted hunting within the site. No suitable breeding habitat can be found. Based on baseline data the proposed development will have a medium impact on the local buzzard population with a loss of some hunting habitat	Permanent and of medium magnitude	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Low sensitivity species + Medium Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	Foraging and commuting birds may temporarily avoid construction areas owing to the noise and increased activity. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites within the surrounds and create a 150m buffer surrounding the zone (Goodship, 2022). Construction will be avoided here until fledging has occurred.	Temporary and of low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Low sensitivity species + Low Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Brown Long-eared bat	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of higher value to Brown Long-eared bats than the open habitat (3 recordings over a 12 night period) however activity is very low for this species. No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects (given the levels of activity from this species).	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Common Pipistrelle	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of marginally higher value to this species than the open habitat (43 recordings compared to 23 over a 12 night period) however activity is very low for this species (average of 0.3 bat passes per hour BP/Hr). No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

Species	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Golden Plover	Direct Habitat Loss	Twenty sightings from within site; Higher numbers observed in the hinterland. Within the overall Grange Castle West landbank, Golden Plover appear to favour fields to the west, and were never recorded perched on lands to the east where a halting site is located. It is likely this species avoids the higher anthropological activity associated with this area. The development will result in the permanent loss of feeding and roosting habitat within the site. This proposal constitutes one portion of a larger scheme (Grange Castle West) where much of the landbank will be transformed from till age to built lands. A road network to the east alongside other developments within the landbank will likely result in the eventual loss of all the Grange Castle lands for use by Golden Plover as even if the fields to the south are not developed, the location of an industrial unit close to a favoured field will likely lead to too much disturbance.	Permanent and of very high magnitude and will result in long-term effect.	Occurs once, long term	The magnitude of the impact is assessed as very high. Medium sensitivity species + very high Impact = very high effect significance.
	Displacement and barrier effect	The IECS Toolkit26 (EU, 2010) suggests that golden plover is of moderate sensitivity to disturbance. There is the potential of disturbance to wintering Golden Plover located in the hinterland through construction phase activities. Based on continued bird surveys through the construction phase it is proposed to identify wintering sites and create a 300m buffer surrounding the zone (buffer size is based on IECS Toolkit26). Activity in this zone will be limited to time when the species is not present.	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
Kestrel	Direct Habitat Loss	The development footprint is dominated by improved grassland with associated hedgerows, providing suitable foraging habitat for the species. Kestrel can nest in a variety of substrates such as rock ledges, old corvid stick nests, bird boxes, buildings etc. Whilst no suitable breeding sites were found within the development footprint it is possible this species is breeding within treelines closeby. Based on baseline data the proposed development will have a medium impact on the local buzzard population with a loss of some hunting habitat	Permanent and of medium magnitude	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Low sensitivity species + Medium Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	Foraging and commuting birds may temporarily avoid construction areas owing to the noise and increased activity. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites and create a 150m buffer surrounding the zone (Goodship, 2022) state the species has a Low/Medium sensitivity to disturbance and recommend a breeding zone of 100 – 200m. Construction will be avoided here until fledging has occurred.	Temporary and of low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted

Species	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
Meadow Pipit	Direct Habitat Loss	The development footprint is dominated by tillage, which provides some suitable nesting, roosting and foraging habitat for the species. Highest suitable Meadow Pipit habitat was found where bird cover planting occurs on a strip of land adjacent to the Grand Canal. This will remain unaffected by the proposed development.	Long term slight Negative	Occurs once, irreversible	The magnitude of the impact is assessed as Low. Medium sensitivity species + Low to medium Impact = Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	There is the potential of disturbance to breeding meadow Pipit because the construction activities will disturb birds and displace them from the area. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites and create a 50m buffer surrounding the zone (50m buffer is based on IECS Toolkit26). Works will avoid key breeding periods with works continuing after fledging.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Lapwing	Direct Habitat Loss	Seven sightings from within site with a max of 9 observed. Higher numbers observed in the hinterland (165). The development will result in the permanent loss of feeding and roosting habitat within the site. It should be noted that the site is surrounded by similar tillage particularly to the west and it is highly likely displaced bids will utilise similar habitats offsite	Long-term Imperceptible Negative	Occurs once, irreversible	The magnitude of the impact is assessed as Medium. Medium sensitivity species + medium Impact = Low effect significance.
	Displacement and barrier effect	The IECS Toolkit26 (EU, 2010) suggests that lapwing is of moderate sensitivity to disturbance. There is the potential of disturbance to wintering Lapwing located in the site during the construction phase leading to disturbance and displacement. Based on continued bird surveys through the construction phase it is proposed to identify wintering sites and create a 200m buffer surrounding the zone (buffer size is based on IECS Toolkit26.).	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
Leisler's Bat	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of higher value to this species than the open habitat (947 recordings compared to 386 over a 12 night period) with good activity levels for this species (average of 6.6 bat passes per hour BP/Hr). This species flies high over habitats and are the most adept Irish bat species at hunting over artificial surfaces thus the transformation of the site may result in only a medium negative to neutral impact. No roosting bats were found.	Permanent and of medium magnitude. Unlikely to result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Medium. Medium sensitivity species + medium Impact = Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

Species	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
Myotis Species	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show very low activity for this species with a single recording from the detector placed in the open over a 12 night period. This suggests the subject site is not utilised by woodland or Daubenton's bats using the Grand Canal. No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Snipe	Direct Habitat Loss	The development footprint is dominated by tillage, which provides some suitable nesting, roosting and foraging habitat for the species. Given the intensive agriculture practiced on the site it is unlikely breeding Snipe are present.	Long term moderate Negative	Occurs once, irreversible	The magnitude of the impact is assessed as moderate. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	Some displacement may occur. Construction activities will be limited to the development footprint so direct disturbance effects will not extend beyond the works areas. There is potential for indirect disturbance to roosting and breeding snipe from noise and visual stimuli associated with construction activities. However, given the low number of snipe that use the site in the context of the estimated national breeding population of 4,275,it is not considered to be a significant effect.	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Medium. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
Soprano Pipistrelle	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of marginally higher value to this species than the open habitat (16 recordings compared to 7 over a 12 night period) however activity is very low for this species (average of 0.1 1 BP/Hr). No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Redwing	Direct Habitat Loss	This species was observed feeding on the site on several occasions however highest activity was noted offsite to the north where grassland has been planted with bird cover crops. In addition this species typically roosts in treelines; none of which are found on the site.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, irreversible	The magnitude of impact is assessed as Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

Species	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	Displacement and barrier effect	There is the potential of disturbance to Redwing during construction phase. Foraging birds may temporarily avoid construction areas owing to the noise and increased activity.	Temporary and of Low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance.

7 MITIGATION MEASURES

7.1 Badger

No measures are required.

7.2 Bats

No loss of bat roosts will occur due to the development. The development of the site will not impact bats utilising the Grand Canal however may have a slight impact on feeding bats. Highest activity recorded was from Leisler's bat; a species adept at hunting over artificial surfaces thus the transformation of the site may result in only a medium negative to neutral impact. It is important to limit artificial lighting within the site to ensure no additional light pollution occurs on bat friendly habitat features.

7.2.1.1 Effects of lighting on bats

BCI's Bats & Lighting document (BCI, 2010) states 'Brown Long-eared bats (*Plecotus auritus*) and Myotis species, commute and forage along dark wildlife corridors such as treelines and consequently shies away from highly illuminated sections. Therefore, illumination can impede their flight to suitable feeding areas. Consideration should be given to ensure that dark wildlife corridors remain in the landscape to allow bats and other wildlife to travel safely to and from feeding habitats.' The report also states 'each species of bat has an optimum level of light for emergence. For example, Daubenton's bats prefer a light level of less than 1 lux.' While the BCT guidelines do not give a recommended level of acceptable lux levels on commuting habitats it notes 'significant effects (on bat activity) have been recorded from as low as 3.6 lux'. Eurobats guidelines state *Myotis daubentonii* and *M. mystacinus/M. brandtii* consistently avoided their preferred habitats, i.e. lakes and forest gaps, in response to the brightness of the Nordic midsummer nights.

Table 7-1 provides a site specific response to the 2018 BCT flowchart which provides best practice guidance when considering effects of lighting schemes on bats.

Table 7-1: Application of BCT, 2018 Flowchart

Step	Query	Response
1	Could bats be present on site?	Yes.
2	Determine the presence of roosting / commuting / feeding habitats	The site is used by feeding and commuting Common Pipistrelle, Soprano Pipistrelle and Leisler's bats. Low level activity was recorded from brown long-eared bat, 40kHz Pipistrelle and unidentified Myotis species
3	Avoid lighting on key habitats and features all together.	The subject development will result in changes to the site including transformation of tillage and hedgerows to built land. Given the nature of the site; avoidance of lighting is not possible.

Step	Query	Response
4	In other locations of value to bats apply mitigation measures to reduce lighting to a minimum.	The lighting plan is designed so that there is a maximum of 1 lux light spill in areas to the north and west where Canal and treelines are located. This will be achieved by using well controlled optics, and mounting the luminaires without any tilt, or with a small 5 degree tilt – away from the boundaries in question. This will result in an overall upward light ratio of 0%. All lights will use an amber white spectrum which does not contain any blue light component. This color type has less of a negative effect on invertebrates and bats in comparison to older models. In other areas of the site with less potential for disturbance 3000k warm white lighting has been proposed (instead of typical 4000k neutral white).
5	Demonstrate compliance with lux levels and buffers	Dark zone will be established to the north of the site. A static monitoring program and Lux survey should be completed in the grassland to the north of the site, adjacent to the Grand Canal prior and after construction. Should issues arising from the planning permission pertaining to bat activity occur further steps can be implemented in order to further reduce light levels.

7.3 Birds

Multiple surveys demonstrate the site will have a low impact any species of note.

- An Ornithologist ECoW will be employed during the construction phase to micromanage construction locations to avoid disturbance on key species.
- The loss of lands usable by Golden plover is of concern and it is essential the flocks utilising the site have alternative, suitable lands they can use going into the future, particularly as development continues westwards. These lands need to be identified and farming practices managed in such a way that Golden Plover can utilise them. Ideally, these lands will already be used by Golden plover as the species appears faithful to existing sites.
- Queries with South Dublin County Council have identified that such lands are available. SDCC are making available an area of land in its ownership within an overall landholding comprising 37 hectares in provision with the policies and objectives set out in the South Dublin County Development Plan 2022-2028 and the South Dublin Biodiversity Action Plan. The grazing lands at this location, which are within a distance of 9.1 km from the Grange Castle West lands contain large scale field systems and short sward management grassland, that can be maintained as a short sward during the winter months, thereby providing optimal conditions to support winter feeding birds. Land management strategies will be agreed with farmers and will form part of the conditions of relevant land management licences issued by the Council to farmers managing the relevant lands.
- Whilst halting the construction to times outside the wintering period was considered, the scale of works was not considered impactful enough to negatively impact wintering birds both within the site and in the surrounds. Rather, an ECoW will be involved in the construction and limit construction in areas based on when they are of value to birds. The monitoring section below outlines how bird surveys will continue during the construction phase and based on these results micro exclusion zones can be put in place. Table 6-3 goes through potential buffer zones and timings when works may need to be halted here. For Golden Plover, a 300m buffer zone will be set in place surrounding the typical resting place of identified flocks. Figure 7-1 below shows the usual feeding grounds for Golden plover. A 300m buffer surrounding this area marginally encroaches within the development site. In order to reduce visual impacts on the species it is proposed to erect 3m high hoarding along the southern and eastern edge of the site prior to the wintering period. The appointed ECoW should regularly visit the site during the wintering period and map flocks behavour. Should flocks of Golden plover be noted within 300m of the southern or western edge of the site this person should have the authority to halt noisy works temporarily. This method based on co-operation between overseeing ornithologist, site manager and NPWS / Local Authority representative will allow works to continue throughout the year whilst also avoiding disturbances to key species at vulnerable times.