

# MAGLIN LRD

VOLUME III  
Appendices



# MAGLIN LRD

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# CHAPTER ONE

## INTRODUCTION

APPENDIX 1-1 Consultation Responses



**APPENDIX 1-1 Consultation Responses**

## Appendix 1.1

### Consultation Response

As part of the scoping process for this EIAR, letters were sent out to the following statutory bodies in March 2024.

- An Taisce
- Bat Conservation Ireland
- Bord Gáis
- Environmental Protection Agency
- Fáilte Ireland
- The Health Service Executive (HSE)
- The National Transport Authority (NTA)
- Department of Education
- Department of Housing, Local Government, and Heritage
- Department of Tourism, Culture, Arts, Gaeltacht, Sport & Media
- Geological Survey Ireland
- The Health and Safety Authority (HSA)
- The Heritage Council
- Inland Fisheries Ireland
- Office of Public Works (OPW)
- Transport Infrastructure Ireland (TII)
- Uisce Éireann
- ESB

A copy of the letter sent to these bodies is provided on the following page. Responses were received from the following:

- Department of Housing, Local Government and Heritage
- Geological Survey Ireland
- Inland Fisheries Ireland
- Transport Infrastructure Ireland (TII)
- Uisce Éireann

These responses were considered in the preparation of this EIAR. A copy of the responses received is provided on the following pages.

«Company\_Name»

05 March 2024

«Address\_1»

«Address\_2»

«Address\_3\_»

«Address\_4»

«Address\_5»

«Email\_»

**Re: Consultation on the preparation of an Environmental Impact Assessment Report for a proposed Large Scale Residential Development at Maglin and Carrigrohane (townlands), Ballincollig, Cork.**

A Chara,

We are acting on behalf of O'Flynn Construction Co. Unlimited Company in the preparation of an Environmental Impact Assessment Report (EIAR) for a proposed Large Scale Residential Development (LRD) at Maglin and Carrigrohane (townlands), Ballincollig, Cork.

Research and baseline analysis for the EIAR has commenced and an impact assessment will be carried out following completion of the design of the proposed development.

If you have any comments in relation to the potential environmental impacts of the proposed development, I would be grateful if you would forward them to me as soon as is convenient. The details of the site location, project description, and proposed works are outlined further below.

#### Proposed Development

O'Flynn Construction Co. Unlimited Company are seeking permission for the construction of c. 1,003 no. residential units, a creche, and all associated landscaping, amenity areas, and site development works Maglin and Carrigrohane (townlands), Ballincollig, Cork

Please find enclosed the proposed draft Site Layout Plan (dwg no.: 2010-100) which includes detail on the current proposed unit mix.

Please note that the details provided in the enclosed drawing are subject to change as the scheme progresses and feedback from the council and other statutory consultees are incorporated.

#### Site Location and Description

The proposed site is location 1.3km to the south of Ballincollig town centre within the townland of Maglin. A small portion of the eastern extremity of the site lies with the townland of Carrigrohane. The subject site is approximately 10 kilometres to west of Cork City Centre. The gross site area comprises 28.53 hectares and has a relatively flat topography with some sloped areas along the southern and eastern boundaries. The lands are located immediately north of the N22 national primary route which connects

the lands to Cork City's environs and major employment hubs. To the north of the site lies agricultural land with Maglin Road located to the west. A farmhouse and associated farmyard are located to the centre of the lands and the lands are currently used for agricultural purposes.

The lands is currently accessed via the Maglin Road to the west with approximately 170 metres of the lands fronting on to Maglin Road. A second future connection point is to be provided via the proposed new link road which will traverse the site from east to west. The lands comprise agricultural fields that are generally rectangular in shape. Maglin House, a late 18<sup>th</sup> / early 19<sup>th</sup> century house sits centrally within the lands. The two-storey, L shaped farmhouse is currently surrounded by a farmyard with associated farm buildings generally located to the rear of the house.

The subject site lies within the development boundary of Ballincollig and is zoned ZO 02 New Residential Neighbourhood where the following objective applies:

*"To provide for new residential development in tandem with the provision of the necessary social and physical infrastructure."*

A small portion, to the east of the stie is zoned ZO 15 Public Open Space where the following objective applies:

*"To protect, retain and provide for passive and active recreational uses, open space, green networks, natural area and amenity facilities.."*

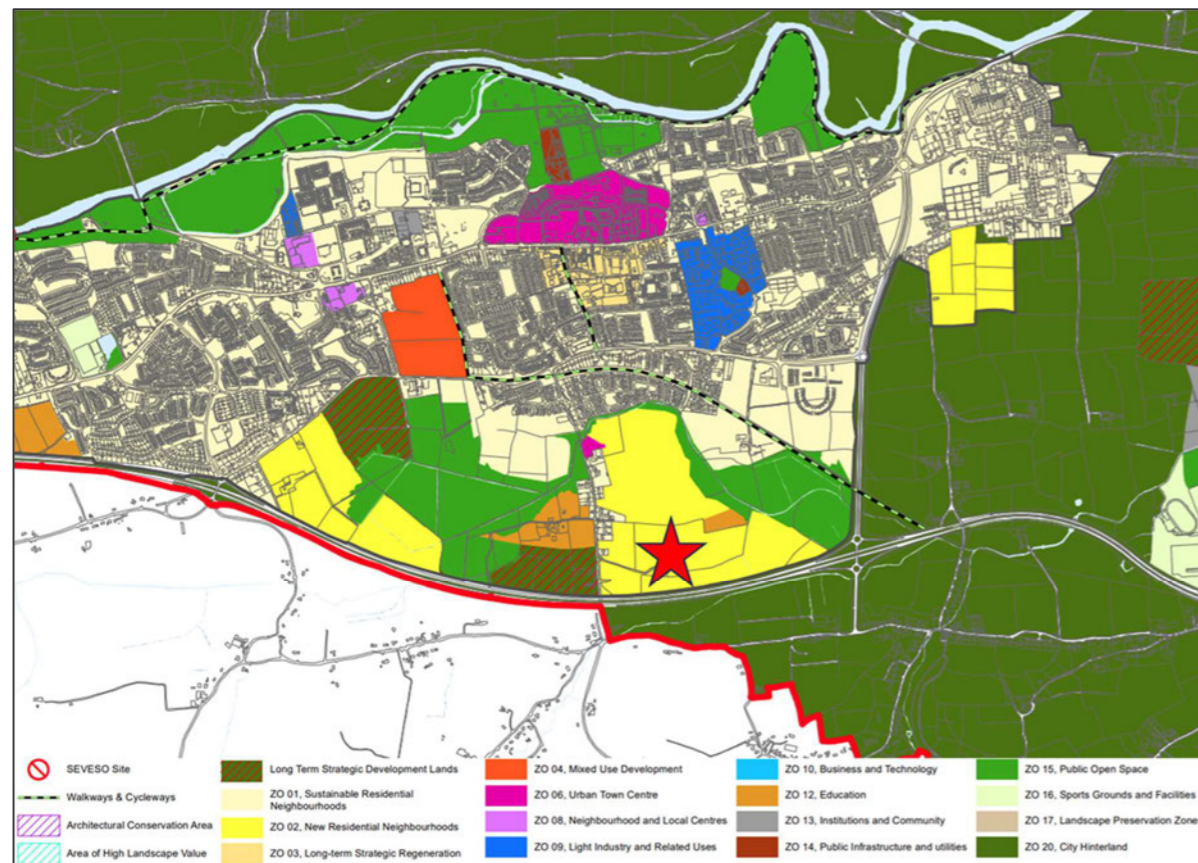


Figure 1 Extract from Cork City Development plan.

## EIAR Structure and Content

The EIAR is divided into three volumes as follows:

- Volume 1: Non-Technical Summary
- Volume 2: Main Environmental Impact Assessment Report
- Volume 3: Appendices

The overall structure of Volume 2 of the EIAR is as follows:

Chapter	Chapter Title
1.	Introduction
2.	Site Location and Project Description
3.	Alternatives Considered
4.	Population and Human Health
5.	Land, Soils, and Geology
6.	Hydrology and Hydrogeology
7.	Air Quality
8.	Climate Change
9.	Noise and Vibration
10.	Landscape and Visual Impact
11.	Traffic and Transport
12.	Material Assets: Service Infrastructure and Utilities
13.	Biodiversity
14.	Cultural Heritage and Archaeology
15.	Significant Interaction of Impacts
16.	Summary of Mitigation Measures and Monitoring
17.	Screening for Major Accidents

Each chapter is to include the following elements:

- Introduction and Methodology
- Description of the Existing Environment
- Impact Assessment. Each discipline will consider impacts under the following headings:
  - Do-Nothing Scenario
  - Construction Phase
  - Operational Phase

In assessing impacts regard will be had to direct impacts, indirect impacts, and cumulative impacts. Where relevant, reference may also be made to 'synergistic impacts' or 'secondary impacts'. The assessment of impacts will have regard to the EPA guidelines and advice notes for preparing EIAR.

As the EIA progresses any relevant permitted or proposed projects will be included in the assessment.

The EIAR will also consider:

- Mitigation Measures
- Residual Impacts

## Summary

In summary, this EIAR will consider the potential impact of the proposed development, in combination with the relevant planning applications in the vicinity.

The EIAR is being co-ordinated by McCutcheon Halley Chartered Planning Consultants. If you have any comments in relation to the potential environmental impacts of the proposed, I would be grateful if you would forward them to me as soon as is convenient.

You can email any comments to me at [skavanagh@mhplanning.ie](mailto:skavanagh@mhplanning.ie)

Yours sincerely,



Saoirse Kavanagh

McCutcheon Halley

An Roinn Tithíochta,  
Rialtais Áitiúil agus Oidhreacht  
Department of Housing,  
Local Government and Heritage



**Ref: Environmental Impact Assessment Report (EIAR) for a proposed Large Scale Residential Development (LRD) at Maglin and Carrigrohance (townlands), Ballincollig, Cork**

*(Please quote in all related correspondence)*

22 April 2024

McCutcheon Halley  
6 Joyce House  
Barrack Square  
Ballincollig  
Cork  
P31 YX97

**Development: Large Scale Residential Development (LRD) at Maglin and Carrigrohance (townlands)**

A Chara,

I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department co-ordinated by the Development Applications Unit under the stated heading:

#### **Nature Conservation**

These observations are intended to assist you in relation to identifying potential impacts on biodiversity and environmental protection in general, in the context of the current proposal. Data collected and surveys carried out in connection with this proposed development may raise other issues that have not been considered here. The observations are not exhaustive and are made without prejudice to any recommendation that may be made by this Department in the future.

#### **Licenses**

Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Act 1976-2018 or derogations under the EC (Birds and Natural Habitats) Regulations 2011, as amended.

In particular bats are subject to a regime of strict protection pursuant to the requirements of the Habitats Directive (92/43/EEC) as transposed in Irish law in Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). A copy of Circular Letter NPWS 2/07 entitled "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for

**Aonad na nIarratas ar Fhorbairt, Oifigí an Rialtais, Bóthar an Bhaile Nua, Loch Garman, Y35 AP90**

Development Applications Unit, Government Offices, Newtown Road, Wexford, Y35 AP90

[manager.dau@npws.gov.ie](mailto:manager.dau@npws.gov.ie)

[www.gov.ie/housing](http://www.gov.ie/housing)



*derogation licences*” can be found on the Departmental web site at [www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf](http://www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf). It should be noted that the Regulations of 1997 have since been superseded by the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Part 6 of those Regulations is now the relevant section dealing with the protection of flora and fauna. Reference to Regulation 23 in the circular letter should be taken to mean Regulation 51 in the current Regulations.

In addition, the EIAR should take account of species protected under the Wildlife Acts regarding impacts on protected species or their resting or breeding places, in particular birds’ nests and will also need to be cognisant of article 5 (d) of the Birds Directive.

In order to apply for any such licenses or derogations that may be required regarding bats and birds the results of a survey should be submitted to this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Should the survey work have taken place well before construction commences, it is recommended that an additional ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the findings of the baseline ecological survey has occurred. As outlined already, if there has been any significant change mitigation, this may require amendment and where a licence has expired, there will be a need for new licence applications for the protected species.

Regarding this specific site it is noted that it appears from the map provided that it is proposed to retain the existing hedgerows. This is a positive but to allow the most successful retention possible the EIA should address and specify the methodology during design and construction which will be used to protect and retain the hedgerows (for example temporary fencing). The wider the buffer/headland beside the hedgerows (as realistic and possible) provided the better from a biodiversity viewpoint. In addition the EIA should address lighting of and light spill onto retained hedgerows (with reducing and eliminating lighting of the retained hedgerows as much as possible the best aim from a biodiversity viewpoint). The hedgerows and their associated stone walls and drainage ditches are the most important habitats on site and are of good quality. Much mammal activity and burrows are evident in association with the hedgerows and a full mammal survey should be carried out as part of the EIA. Any fencing proposals should consider and propose future mammal access mitigation.

A bat survey and report will be important due to the hedgerow foraging habitat and the existing farm house and buildings should be surveyed for potential bat roosts (with the same applying to mature or ivy covered trees). The house and buildings should also be checked for nesting/roosting birds.

Regarding Lighting the procedures outlined in ‘Guidance Note 08/18 Bats and Artificial Lighting in the UK’ and Eurobats ‘Guidelines for Consideration of Bats in Lighting Projects’ provide useful guidance with respect to lighting design in ecologically sensitive locations, such as along treelines and hedgerows. Dark Sky Ireland also provide useful guidance “Best practice in public lighting” , notably that “warm” colour temperatures should be used at 2700K



or less. . Lighting of the hedgerows should be avoided or minimised (this is particularly important regarding continuing usage by bat species). Minimising lighting through directional lighting, potential cowls etc. should be considered. The project should also ensure that the use of energy efficient (LED) lighting, does not have adverse effects on biodiversity by limiting lighting only to where it is required and using ‘warm white’ lighting with a Correlated Colour Temperature (CCT) of below 2700 kelvins. It must have smart control systems to allow cut-off periods during hours of darkness and diming at dawn and dusk.

The landscape plan should have regard to the All-Ireland Pollinator Plan for 2021-2025. Regarding the choice of any proposed wildflower mix reference should be made to the data in the recent paper Barry, C.; Hodge, S. ‘You Reap What You Sow: A Botanical and Economic Assessment of Wildflower Seed Mixes Available in Ireland’. Conservation 2023, 3, 73–87 (<https://doi.org/10.3390/conservation3010007>).

You are requested to send any further communications to this Department’s Development Applications Unit (DAU) at [referrals@npws.gov.ie](mailto:referrals@npws.gov.ie), where used, or to the following address:

The Manager  
Development Applications Unit (DAU)  
Government Offices  
Newtown Road  
Wexford  
Y35 AP90

Is mise, le meas

David O’Connor  
Development Applications Unit  
Administration

Saoirse Kavanagh  
McCutcheon Halley  
6 Joyce House,  
Barrack Square, Ballincollig,  
Cork, P31 YX97

06 March 2024

**Re: Consultation on the preparation of an Environmental Impact Assessment Report for a proposed Large Scale Residential Development at Maglin and Carrigrohane (townlands), Ballincollig, Cork.**

**Your Ref: n/a**  
**Our Ref: 24/69**

Dear Saoirse,

Geological Survey Ireland is the national earth science agency and is a division of the Department of the Environment, Climate and Communications. We provide independent geological information and gather various data for that purpose. Please see our [website](#) for data availability. We recommend using these various data sets, when conducting the EIA, SEA, planning and scoping processes. Use of our data or maps should be attributed correctly to 'Geological Survey Ireland'.

The publicly available data referenced/presented here, should in no way be construed as Geological Survey Ireland support for or objection to the proposed development or plan. The data is made freely available to all and can be used as independent scientific data in assessments, plans or policies. It should be noted that in many cases this data is a baseline or starting point for further site specific assessments.

With reference to your email received on the 05 March 2024, concerning the Consultation on the preparation of an Environmental Impact Assessment Report for a proposed Large Scale Residential Development at Maglin and Carrigrohane (townlands), Ballincollig, Cork, Geological Survey Ireland would encourage use of and reference to our datasets. Please find attached a list of our publicly available datasets that may be useful to the environmental assessment and planning process. We recommend that you review this list and refer to any datasets you consider relevant to your assessment. The remainder of this letter and following sections provide more detail on some of these datasets.

#### **Geoheritage**

A national inventory of geoheritage sites known as County Geological Sites (CGSs) is managed by the Geoheritage Programme of Geological Survey Ireland. CGSs, as adopted under the National Heritage Plan, include sites that are of national importance which have been selected as the very best examples for NHA (Natural Heritage Areas) designation. NHA designation will be completed in partnership with the National Parks and Wildlife Service (NPWS). CGSs are now routinely included in County Development Plans and in the GIS of planning departments, to ensure the recognition and appropriate protection of geological heritage within the planning system. CGSs can be viewed online under the Geological Heritage tab on the online [Map Viewer](#).

The audit for Cork City was completed in 2022. The full report details can be found [here](#). **Our records show that there are no CGSs in the vicinity of the proposed development.**

#### **Groundwater**

Geological Survey Ireland's [Groundwater and Geothermal Unit](#), provides advice, data and maps relating to groundwater distribution, quality and use, which is especially relevant for safe and secure drinking water supplies and healthy ecosystems.

Proposed developments need to consider any potential impact on specific groundwater abstractions and on groundwater resources in general. We recommend using the groundwater maps on our [Map viewer](#) which should include: wells; drinking water source protection areas; the national map suite - aquifer, groundwater vulnerability, groundwater recharge and subsoil permeability maps. **For areas underlain by limestone, please refer to the karst specific data layers (karst features, tracer test database; turlough water levels (gwlevel.ie).** Background information is also provided in the Groundwater Body Descriptions. Please read all disclaimers carefully when using Geological Survey Ireland data.

**The Groundwater Data Viewer indicates an aquifer classed as a 'Regionally Important Aquifer - Karstified (diffuse)' underlies the proposed development.**

**The Groundwater Vulnerability map indicates the range of groundwater vulnerabilities within the area covered is variable. We would therefore recommend use of the Groundwater Viewer to identify areas of High to Extreme Vulnerability and 'Rock at or near surface' in your assessments, as any groundwater-surface water interactions that might occur would be greatest in these areas.**

[GWClimate](#) is a groundwater monitoring and modelling project that aims to investigate the impact of climate change on groundwater in Ireland. This is a follow on from a previous project (GWFlood) and the data may be useful in relation to Flood Risk Assessment (FRA) and management plans. Maps and data are available on the [Map viewer](#).

Geological Survey Ireland has completed Groundwater Protection Schemes (GWPSs) in partnership with Local Authorities, and there is now national coverage of GWPS mapping. A Groundwater Protection Scheme provides guidelines for the planning and licensing authorities in carrying out their functions, and a framework to assist in decision-making on the location, nature and control of developments and activities in order to protect groundwater. **The Groundwater Protection Response overview and link to the main reports is here: <https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/projects/protecting-drinking-water/what-is-drinking-water-protection/county-groundwater-protection-schemes/Pages/default.aspx>**

#### **Geological Mapping**

Geological Survey Ireland maintains online datasets of bedrock and subsoils geological mapping that are reliable and accessible. We would encourage you to use these data which can be found [here](#), in your future assessments.

**Please note we have recently launched QGIS compatible bedrock (100K) and Quaternary geology map data, with instructional manuals and videos. This makes our data more accessible to general public and external stakeholders. QGIS compatible data can be found in our downloadable bedrock 100k .zip file on the [Data & Maps](#) section of our website.**

Our 3D models can help stakeholders visualize, understand and characterise geology, for deposit and resource mapping, for flooding and for urban geology applications including basement impact assessment, Sustainable Drainage Systems (SuDS), and subsurface management. Our 3D models offer a key element of geotechnical risk management by identifying areas requiring further site investigation.

Further information and download instructions for the Quaternary 3D model of Cork are available on the Geological Mapping programme dedicated [here](#) and [here](#).

#### **Geotechnical Database Resources**

Geological Survey Ireland continues to populate and develop our national geotechnical database and viewer with site investigation data submitted voluntarily by industry. The current database holding is over 7500 reports with 134,000 boreholes; 31,000 of which are digitised which can be accessed through downloads from our [Geotechnical Map Viewer](#). We would encourage the use of this database as part of any baseline geological assessment of the proposed development as it can provide invaluable baseline data for the region or vicinity of proposed development areas. This information may be beneficial and cost saving for any site-specific investigations that may be designed as part of the project.

#### **Geohazards**

Geohazards can cause widespread damage to landscapes, wildlife, human property and human life. In Ireland, landslides, flooding and coastal erosion are the most prevalent of these hazards. We recommend that geohazards be taken into consideration, especially when developing areas where these risks are prevalent, and we encourage the use of our data when doing so.

Geological Survey Ireland has information available on landslides in Ireland via the National Landslide Database and Landslide Susceptibility Map both of which are available for viewing on our dedicated [Map Viewer](#).



Associated guidance documentation relating to the National Landslide Susceptibility Map is also available.

Geological Survey Ireland also engaged in a national project on Groundwater Flooding. The data from this project may be useful in relation to Flood Risk Assessment (FRA) and management plans, and is described in more detail under 'Groundwater' above.

#### **Natural Resources (Minerals/Aggregates)**

Geological Survey Ireland provides data, maps, interpretations and advice on matters related to minerals, their use and their development in our [Minerals section](#) of the website. The Active Quarries, Mineral Localities and the Aggregate Potential maps are available on our [Map Viewer](#).

We would recommend use of the Aggregate Potential Mapping viewer to identify areas of High to Very High source aggregate potential within the area. In keeping with a sustainable approach we would recommend use of our data and mapping viewers to identify and ensure that natural resources used in the proposed development are sustainably sourced from properly recognised and licensed facilities, and that consideration of future resource sterilization is considered.

#### **Guidelines**

The following guidelines may also be of assistance:

- Institute of Geologists of Ireland, 2013. Guidelines for the Preparation of the Soils, Geology and Hydrogeology Chapters of Geology in Environmental Impact Statements.
- [EPA, 2022](#). Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)

#### **Other Comments**

Should development go ahead, all other factors considered, Geological Survey Ireland would much appreciate a copy of reports detailing any site investigations carried out. The data would be added to Geological Survey Ireland's national database of site investigation boreholes, implemented to provide a better service to the civil engineering sector. Data can be sent to the Geological Mapping Unit, at <mailto:GeologicalMappingInfo@gsi.ie>, 01-678 2795.

I hope that these comments are of assistance, and if we can be of any further help, please do not hesitate to the Geological Survey Ireland Planning Team at [GSIPlanning@gsi.ie](mailto:GSIPlanning@gsi.ie).

Yours sincerely,

#### **Geoheritage and Planning Programme**

Enc: Table - Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes.

Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes  
following European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018  
(S.I. No. 296 of 2018)

Geological Survey Ireland Programme	Dataset	Relevant EIA Topic	Coverage	Description / Notes / Limitations	Link to Geological Survey Ireland map viewer
Geohazards	Landslide: National landslide database and landslide susceptibility map	Land & Soil/Climate/Landscape	National	Associated guidance documentation relating to the National Landslide Susceptibility Map is also available.	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b68cf1e4a90445981f950e9b9c5625c">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b68cf1e4a90445981f950e9b9c5625c</a>
Geohazards	Groundwater Flooding (Historic)	Water	Regional	Provide information of historic flooding, both surface water and groundwater. [A lack of flooding presented in any specific location of the map only indicates that a flood has not been detected. It does not indicate that a flood cannot occur in that location at present or in the future]	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc</a>
Geohazards	Groundwater Flooding (Predictive)	Water	Regional	Provides information on the probability of future karst groundwater flooding (where available). [The maps do not, and are not intended to, constitute advice. Professional or specialist advice should be sought before taking, or refraining from, any action on the basis of the flood maps]	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc</a>
Geohazards	Radon Map	Land & Soils/Air	National		<a href="http://www.epa.ie/radiation/radonmap/">http://www.epa.ie/radiation/radonmap/</a>
Geoharitage	County Geological Sites as adopted by National Heritage Plan and listed in County Development Pla	Land & Soils/Landscape	Regional	All geological heritage sites identified by Geological Survey Ireland are categorised as CGS pending any further NHA designation by NPWS.	<a href="https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228">https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228</a>
Geological Mapping	Bedrock geology:	Land & Soils	National	1:100,000 scale and associated memoirs.	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0</a>
Geological Mapping	Bedrock geology:	Land & Soils	Regional	1:50,000 scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0</a>
Geological Mapping	Quaternary geology: Sediments	Land & Soils	National	1:50,000 scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0</a>
Geological Mapping	Quaternary geology: Geomorphology	Land & Soils	National	1:50,000 scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&amp;scale=0</a>
Geological Mapping	Physiographic units:	Land & Soils	National	Broad-scale physical landscape units mapped at 1:100,000 scale in order to be represented as a cartographic digital map at 1:250,000 scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=afa76a420f54877843aca1bc075c62b">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=afa76a420f54877843aca1bc075c62b</a>
Geological Mapping	GeoUrban: Spatial geological data for the greater Dublin and Cork areas	Land & Soils	Regional	includes 3D models	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9768f4818b79416093b6b2212a850ce&amp;scale=0">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9768f4818b79416093b6b2212a850ce&amp;scale=0</a>
Geological Mapping	Geotechnical database	Land & Soils	National	Digitised geotechnical and Site Investigation Reports and boreholes which can be accessed through online downloads	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=a2718be1873d47a585a3f0415b4a724c">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=a2718be1873d47a585a3f0415b4a724c</a>
Goldmine	Historical data sets including geological memoirs and 6" to 1 mile geological mapping records	Land & Soils/Water	National	available online	<a href="https://secure.dcae.gov.ie/goldmine/index.html">https://secure.dcae.gov.ie/goldmine/index.html</a>
Groundwater & Geothermal	Groundwater resources (aquifers)	Water	National	Data limited to 1:100,000 scale; sites should be investigated at local scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Groundwater recharge.	Water	National	Data limited to 1:40,000 scale; sites should be investigated at local scale; long term annual average recharge	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Groundwater vulnerability.	Water	National	Data limited to 1:40,000 scale; sites should be investigated at local scale	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Group scheme and public supply source protection areas.	Water	National	Not all PWS / GWS have SPZ / ZOC. Check with IW / coco / NFGWS for private supplies.	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Groundwater Protection Schemes	Water	National	Data is limited to scale of 1:40,000. Data does not include all of the source protection areas	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Catchment and WFD management units.	Water	National		<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	karst specific data layers	water	National	For areas underlain by limestone, includes karst features, tracer test database; turlough water levels (gwlevel.ie).	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Wells and Springs	Water	National	Not comprehensive, there may be unrecorded wells and springs	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef</a>
Groundwater & Geothermal	Groundwater body Descriptions	Water	National	Not exhaustive; only those in designated SACs; could be other GWDEs; for more information contact NPWS / EPA / site investigations	<a href="https://www.gsi.ie/en-ie/programmes-and-projects/groundwater-and-geothermal-unit/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx">https://www.gsi.ie/en-ie/programmes-and-projects/groundwater-and-geothermal-unit/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx</a>
Groundwater & Geothermal	Geothermal Suitability maps	Land & Soils/Water	National	Also, Roadmap for a Policy and Regulatory Framework for Geothermal Energy, November 2020	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9ee46bee08de41278b90a991d60c0b9e">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9ee46bee08de41278b90a991d60c0b9e</a>
Marine & Coastal Unit	INFOMAR - Ireland's national marine mapping programme; providing key baseline data for Ireland's	Water	National		<a href="https://secure.dcae.gov.ie/GSI/INFOMAR_VIEWER/">https://secure.dcae.gov.ie/GSI/INFOMAR_VIEWER/</a>
Marine & Coastal Unit	CHERISH - Coastal change project (Climate, Heritage and Environments of Reefs, Islands, and Headl	Water	Regional		<a href="http://www.cherishproject.eu/en/">http://www.cherishproject.eu/en/</a>
Marine & Coastal Unit	Coastal Vulnerability Index (CVI).	water /Land & Soils	Regional	Currently the project is being carried out on the east coast and will be rolled out nationally	<a href="https://www.gsi.ie/en-ie/programmes-and-projects/marine-and-coastal-unit/projects/Pages/Coastal-Vulnerability-Index.aspx">https://www.gsi.ie/en-ie/programmes-and-projects/marine-and-coastal-unit/projects/Pages/Coastal-Vulnerability-Index.aspx</a>
Minerals	Aggregate potential	Land & Soils/Material Assets	National	Consideration of mineral resources and potential resources as a material asset which should be explicitly recognised within the environmental assessment process	<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956</a>
Minerals	Active quarries	Land & Soils	National		<a href="https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956">https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956</a>
Minerals	Historic mines	Land & Soils/Cultural Heritage	National	Inventory and Risk Classification 2009. Environmental Protection Agency, Economic Minerals Division and Geological Survey Ireland (DECC).	<a href="https://gis.epa.ie/EPA/Maps/default?eastings=7&amp;northing=7&amp;lid=EPA.LEMA.Facilities.Extractive.Facilities">https://gis.epa.ie/EPA/Maps/default?eastings=7&amp;northing=7&amp;lid=EPA.LEMA.Facilities.Extractive.Facilities</a>
Tellus	Geochemical data: multi-element data for shallow soil, stream sediment and stream water	Land & Soils	Regional	A national mapping programme	<a href="https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754">https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754</a>
Tellus	Airborne geophysical data including radiometrics, electromagnetics and magnetics	Land & Soils	Regional	A national mapping programme	<a href="https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754">https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754</a>
Tellus	urban geochemistry mapping (Dublin SURGE project).	Land & Soils	Regional		<a href="https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754">https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707f72754</a>

Notes:

- The maps and data listed above are available on the Geological Survey Ireland map viewer <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>
- Please read all disclaimers carefully when using Geological Survey Ireland data
- Geological Survey Ireland and Irish Concrete Federation published guidelines for the treatment of geological heritage in the extractive industry in 2008.

## Saoirse Kavanagh

**From:** Michael McPartland <Michael.McPartland@fisheriesireland.ie>  
**Sent:** Friday 5 April 2024 12:27  
**To:** Saoirse Kavanagh  
**Subject:** EIAR Consultation - Maglin, Ballincollig LRD

**NOTE:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Saoirse,

Thank you for your recent email regarding the above-mentioned.

It appears it may be proposed to dispose of septic effluent from the development to the public sewer. IFI would ask that Irish Water signifies there is sufficient capacity in existence so that it does not overload either hydraulically or organically existing treatment facilities or result in polluting matter entering waters. Should this not be the case then please forward proposals for alternative treatment and disposal options.

IFI would ask that there be no interference with, bridging, draining, or culverting of the adjacent river or any watercourse its banks or bankside vegetation to facilitate this development, without the prior approval of IFI and that full cognisance is given to IFI "Guidelines on protection of fisheries during construction works in and adjacent to waters"

<https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters>

Additional any development works which would result in loss of flood plain or increase in off site flows above greenfield levels should be avoided.

Michael Mc Partland  
Senior Fisheries Environmental Officer.

-----  
Iascach Intíre Éireann  
Inland Fisheries Ireland

Tel + 353 (0)26 412 21/2  
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Help Protect Ireland's Inland Fisheries

## Michael McPartland Senior Fisheries Environmental Officer

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Help us protect Ireland's rivers, lakes and coastlines by reporting illegal fishing, water pollution or invasive species. Our confidential phone number is 0818 34 74 24, which is open 24 hours a day / 7 days a week.

To read our Privacy Policy and Email Disclaimer Notice, Please visit [www.fisheriesireland.ie](http://www.fisheriesireland.ie)

**From:** Saoirse Kavanagh <[skavanagh@mhplanning.ie](mailto:skavanagh@mhplanning.ie)>  
**Sent:** Tuesday, March 5, 2024 3:31 PM  
**To:** info <[info@fisheriesireland.ie](mailto:info@fisheriesireland.ie)>  
**Cc:** Roisin O'Callaghan <[Roisin.O'Callaghan@fisheriesireland.ie](mailto:Roisin.O'Callaghan@fisheriesireland.ie)>; Matthew Carroll <[Matthew.Carroll@fisheriesireland.ie](mailto:Matthew.Carroll@fisheriesireland.ie)>  
**Subject:** EIAR Consultation - Maglin, Ballincollig LRD

A Chara,

We are acting on behalf of O'Flynn Construction Co. Unlimited Company in the preparation of an Environmental Impact Assessment Report (EIAR) for a proposed Large Scale Residential Development (LRD) at Maglin and Carrigrohane (townlands), Ballincollig, Cork.

Research and baseline analysis for the EIAR has commenced and an impact assessment will be carried out following completion of the design of the proposed development.

Please see attached:

- a letter with details of the site location, proposed development, and the proposed EIAR.
- the current draft Site Layout Plan (dwg no.: 2010-100), which includes detail on the current proposed unit mix.

If you have any comments in relation to the potential environmental impacts of the proposed development, I would be grateful if you would forward them to me as soon as is convenient.

Kind regards,  
Saoirse

Saoirse Kavanagh  
Executive Planning Consultant  
McCutcheon Halley  
CHARTERED PLANNING CONSULTANTS  
Mobile: +353 (0)83 070 1855

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Saoirse Kavanagh  
Planning Consultant  
6 Joyce House  
Barrack Square  
Ballincollig  
Cork  
P31YX97.

Dáta | Date  
8 March 2024

Ár dTag | Our Ref.  
TII24-126485

**Re: EIA Consultation - Residential Development (LRD) at Maglin, Ballincollig, Cork**

Dear Ms. Kavanagh

Transport Infrastructure Ireland (TII) acknowledges receipt of your EIA Scoping request in respect of the above proposed project located contiguous with the N22.

National Strategic Outcome 2 of the National Planning Framework includes the objective to maintain the strategic capacity and safety of the national roads network. It is also an investment priority of the National Development Plan, to ensure that the extensive transport networks which have been greatly enhanced over the last two decades, are maintained to a high level to ensure quality levels of service, accessibility and connectivity to transport users.

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals following the examination of any valid application referred.

With respect to EIA Scoping issues, the recommendations indicated below provide only general guidance for the preparation of EIA, which may affect the National Roads Network. The developer should have regard, *inter alia*, to the following:

1. Regard shall be had to national planning policy indicated in Spatial Planning and National Roads Guidelines for Planning Authorities (2012) and relevant standards and guidance in TII Publications
2. Consultations should be had with the relevant Local Authority National Roads Design Office with regard to locations of existing and future transport schemes in the vicinity. The developer should have regard to road or transport schemes in the area.
3. Any proposals related to future public transport provision, including future Luas are a matter for the NTA.
4. The Authority's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. The developer should in particular have regard to any potential cumulative impacts on relevant road networks. Transport analysis should also consider:
  - i. A mobility management plan should accompany the transport assessment,
  - ii. Modal share targets should be outlined and how any PT modal share is accommodated,

- iii. Measures proposed to reduce car dependency should be outlined,
- iv. Detailed phasing proposals of development with associated transport infrastructure provision is required,
- v. Consider and address cumulative impacts of other development and impacts on limited national road capacity,
- vi. The traffic and transport assessment should consider all road users,
- vii. Mitigation measures should be aligned with phasing of road infrastructure improvements and required public transport interventions; all clearly outlined.

5. Regard to assessments, design and construction and maintenance standards and guidance are available at [TII Publications](#). In particular, the developer is advised to address the requirements for a Road Safety Audit (RSA).

6. The EIA should identify the methods/techniques proposed for any works traversing/in proximity to the national road network in order to demonstrate that the development can proceed complementary to safeguarding the capacity, safety, and operational efficiency of that network.

With respect to the extent of the lands in question, it should be noted that national road surface water drainage regimes are constructed with the objective of disposing of national road surface water only. It is important that capacity in the national roads surface water drainage regime is retained to address this essential function.

Having regard to the foregoing, TII advises it would not support any private development application accessing the national road drainage regime and the Council should ensure that this does not occur.

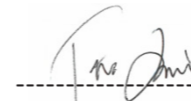
7. The developer, in conducting Environmental Impact Assessment, should have regard to TII Environment Guidelines that deal with assessment and mitigation measures for varied environmental factors and occurrences. The developer is advised that any additional works/structures required because of the Assessment should be funded by the developer.

TII will entertain no future claims in respect of impacts (e.g. noise, dust, visual and air), due to the presence of the existing road or any road scheme especially in vicinity of the N22.

Notwithstanding, any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.

I trust that the above comments are of assistance in your EIA preparation.

Yours sincerely,



Tara Spain,  
Head of Land Use Planning.

Our Ref: PN2400001292

For the attention of Saoirse Kavanagh

McCutcheon Halley  
Chartered Planning Consultants  
6 Joyce House,  
Barrack Square,  
Ballincollig,  
Cork,  
P31 YX97

8<sup>th</sup> April, 2024

By Email: [skavanagh@mhplanning.ie](mailto:skavanagh@mhplanning.ie)

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**[www.water.ie](http://www.water.ie)**

**Re: EIA Scoping Request – Proposed residential development located for a Large Scale Residential Development (1,003 no. units) located in Maglin and Carrigrohane (townlands), Ballincollig, Cork.**

Dear Saoirse Kavanagh,

Uisce Éireann has received notification of your Environmental Impact Assessment (EIA) scoping request relating to O'Flynn Construction Co. Unlimited Company's forthcoming planning application for a residential development in Co. Cork.

Please see attached, Uisce Éireann's scoping opinion in relation to Water Services. On receipt of the planning referral, Uisce Éireann will review the finalised Environmental Impact Assessment Report (EIAR) as part of the planning process.

Queries relating to the terms and observations above should be directed to [planning@water.ie](mailto:planning@water.ie)

Yours sincerely,

PP Ali Robinson

Signed on behalf of Geoffrey Burke

Connections and Developer Services

## Uisce Éireann's Response to EIA Scoping Requests

At present, Uisce Éireann does not have the capacity to advise on the scoping of individual projects. However, in general the following aspects of Water Services should be considered in the scope of an EIA where relevant;

- a) Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.
- b) Where the development proposes the backfilling of materials, the applicant is required to include a waste sampling strategy to ensure the material is inert.
- c) Mitigations should be proposed for any potential negative impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response.
- d) Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/ surface water interactions.
- e) Impacts of the development on the capacity of water services (*i.e. do existing water services have the capacity to cater for the new development*). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Irish Water network. All pre-connection enquiry forms are available from <https://www.water.ie/connections/connection-steps/>.
- f) The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.
- g) In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network.
- h) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers.
- i) Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.
- j) When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Details, where known, can be obtained by emailing an Ordnance

Survey map identifying the proposed location of the applicant's intended development to [datarequests@water.ie](mailto:datarequests@water.ie)

- k) Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site.
- l) Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report.
- m) Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (*and resultant potential impact on the capacity of the source*) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.
- n) Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/ sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report.
- o) Mitigation measures in relation to any of the above ensuring a zero risk to any Irish Water drinking water sources (Surface and Ground water).

*This is not an exhaustive list.*

**Please note;**

- Where connection(s) to the public network is required as part of the development proposal, applicants are advised to complete the Pre-Connection Enquiry process and have received a Confirmation of Feasibility letter from Uisce Éireann ahead of any planning application.
- Uisce Éireann will not accept new surface water discharges to combined sewer networks.

# CHAPTER FIVE

## LANDSCAPE AND VISUAL

APPENDIX 5-1 Verified View Photomontages



**APPENDIX 5-1 Verified View Photomontages**

Verified View Photomontages for  
Residential Development at Maglin  
Ballincollig, Cork



July 2025

Document at A3 prepared by

G-Net 3D, NSC Campus, Mahon Cork

Tel: 021-230 7043

[www.gnet3d.com](http://www.gnet3d.com)

## Verified View Photomontage Methodology

The methodology used to develop the photomontages is based on the “Visual Representation of Development Proposals” Guidance note by the Landscape Institute, 2019.

### Photography

The photography was carried out on the November 11<sup>th</sup> and 12<sup>th</sup>, 2024 and July 1<sup>st</sup>, 2025 using Sony α7RIII full frame camera. Two lenses 24mm and 50mm prime lens were used for the photography.

A 24mm - wide angle lens was selected for the photography to provide more information on the context around the proposed development. The horizontal field of view of these photographs is 74°. The above-mentioned guidance suggests that 40° angle is the closest to human eye vision and is recommended for the verified photomontages. In the cases where the wide lens is used, there should be an indication of 40° field of view, which is shown on the bottom of all the views. A recommended viewing distance of the photomontages taken using 50mm lens is around 500mm and 24mm lens - 300mm from eyes when printed on A3 paper.

Geomax Zenith 60 GPS Antennae was used to accurately record the viewpoint and reference markers' coordinates and height levels. Viewpoint locations are indicated in the viewpoint map on page 3, viewpoint coordinates and information on photography is under each photo.

### Modelling

Preparation of an accurate 3D model of the proposed residential development, including landscape and infrastructure.

### Setup

The following information is used to accurately position the model of the proposed development into the photographs:

- Site survey,
- Photographs,
- Verified viewpoint coordinates and height levels are accurately marked on the location OSi map.

To match the 3D camera view with the photograph we take the following steps:

The camera height is taken from information gathered on the levels from where the photos are taken (table below). The height levels of the proposed development are outlined on the site. Focal length is based on the photograph EXIF info.

This data is imported into our 3D software and the 3D camera is matched with the selected photographs. To match the 3D camera accurately we use all the above data and the reference 3D models. The reference 3D models are existing structures i.e. buildings, roads, lamps, etc which are visible on the photographs. These items are modelled based on the survey information. After all the above conditions are fulfilled and we are satisfied that the camera matches correctly, we proceed to the next step.

### Rendering

We apply the materials and textures prior to rendering the photomontage images. Light settings are adjusted to match the brightness of the photographs and sun is positioned according to the date and time the photo was taken.

### Post processing

This process means incorporating a 3D image of the proposed development into the photograph to achieve the final result.



<< 50mm 39.6°

39.6° 50mm >>

View 1. As Exists



< 50 mm 39.6°

50 mm 39.6° >

View 1. Outline of Proposed



< 50 mm 39.6°

50 mm 39.6° >

View 2. As Exists



View 2. As Proposed



< 24mm 73.7°

<<50 mm 39.6°

39.6° 50mm>>

73.7° 24mm >

View 3. As Exists



< 50 mm 39.6°

50 mm 39.6° >

View 3. As Proposed



< 50 mm 39.6°

50 mm 39.6° >

View 4. As Exists



< 50 mm 39.6°

50 mm 39.6° >

View 4. As Proposed



< 50 mm 39.6°

50 mm 39.6° >

View 5. As Exists



< 24mm 73.7°

<<50 mm 39.6°

39.6° 50mm>>

73.7° 24mm >

View 5. Outline of Proposed



< 24mm 73.7°

<<50 mm 39.6°

39.6° 50mm>>

73.7° 24mm >

View 6. As Exists



< 50 mm 39.6°

50 mm 39.6° >

View 6. As Proposed



< 50 mm 39.6°

50 mm 39.6° >

View 7. As Exists



< 24mm 73.7°

<<50 mm 39.6°

39.6° 50mm>>

73.7° 24mm >

View 7. As Proposed



View 8. As Exists



< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

View 8. As Proposed



< 24mm 73.7°

<<50 mm 39.6°

39.6° 50mm>>

73.7° 24mm >

View 9. As Exists



< 50 mm 39.6°

50 mm 39.6° >

View 9. As Proposed



< 50 mm 39.6°

50 mm 39.6° >

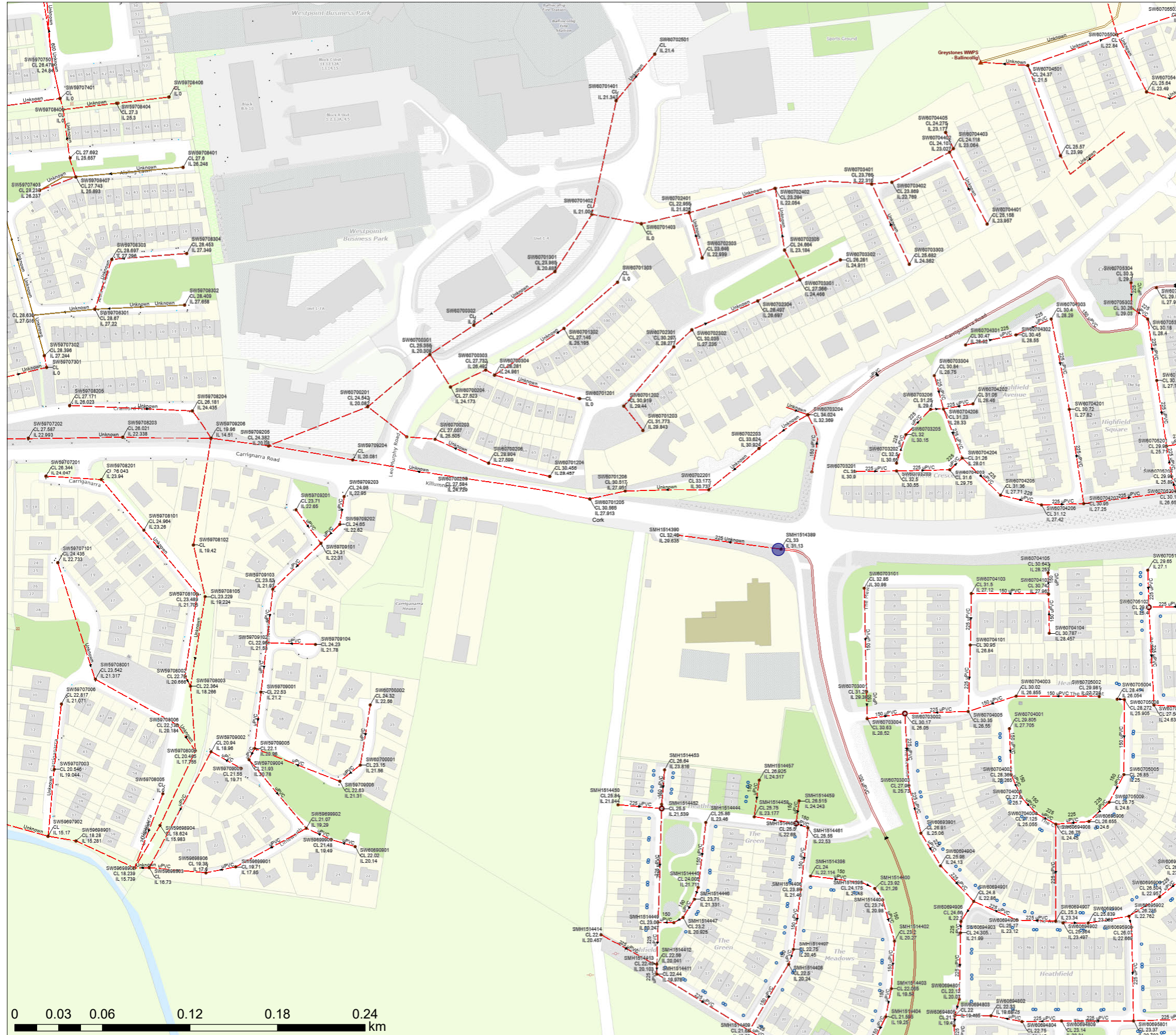
# CHAPTER SEVEN

## MATERIAL ASSETS: BUILT SERVICES

- APPENDIX 7-1 Public Water and Wastewater Systems operated by Uisce Éireann
- APPENDIX 7-2 Confirmation of Feasibility and Statement of Design Acceptance
- APPENDIX 7-3 Proposed Wastewater Layout
- APPENDIX 7-4 Proposed Watermain Layout

**APPENDIX 7-1 Public Water and Wastewater Systems  
operated by Uisce Éireann**

# CDS Viewer Web Map



Print Date: 7/2/2025

Printed by: Uisce Éireann

1. Tá toirmeasc ar aon chuid den líneocht seo a aththairgeadh nó a sheoladh ar aghaidh in aon slí, nó aon chuid den líneocht a stóráil ar aon chóras aisghabhála d'aon sórt gan cead i scríbhinn ó shealbhóir an chópchirt de chuid Uisce Éireann seachas mar a aontófar an doiciméad a úsáid i ndáil leis an tionscadal dá n-eisíodh an doiciméad chuige ar dtús.

2. Cé go ndearnadh gach uile iarracht cúram a dhéanamh ina tiomsú, tugann Uisce Éireann an fhaisnéis seo i ndáil le láthair a líonra faoi thalamh mar threoir ghinearálta ar an dian-tuiscint go bhfuil an fhaisnéis bunaithe ar an eolas is fearr curtha ar fáil d'Uisce Éireann ó gach uile Udáras Áitiúil in Éirinn. Séannann Uisce Éireann freagracht as cruinníocht, comhláine, nó nádúr chun dáta na faisnéise a tugadh agus ní thabharfaidh Uisce Éireann aon ráthaochtaí ná gealltanas ná barántaí maidir leis an bhfaisnéis agus séannann Uisce Éireann gach aon dlíteanas a d'fhéadfadh a eascairt as aon earráidí nó as aon fhaillí ar bith. Níor cheart braith ar an bhfaisnéis seo má bhionn tochairtí nó aon obreacha eile ar siúl i gcoimeád an líonra faoi thalamh de chuid Uisce Éireann. Is faoi na páirtithe ag déanamh na dochairtí nó aon obreacha eile atá sé deimhin a dhéanamh de go sainaitheofar láthair chruinn an líonra faoi thalamh de chuid Uisce Éireann sula dtabharfar faoi thús a chur le haon tochairtí nó obreacha eile. Ní léirítear naisc sheirbhíse de ghnáth ach bí ar an airdeall go bhféadfaidís a bheith ann.

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2. Whilst every care has been taken in its compilation, Uisce Éireann gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann. Uisce Éireann can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations, or any other works being carried out in the vicinity of the Uisce Éireann underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Uisce Éireann underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

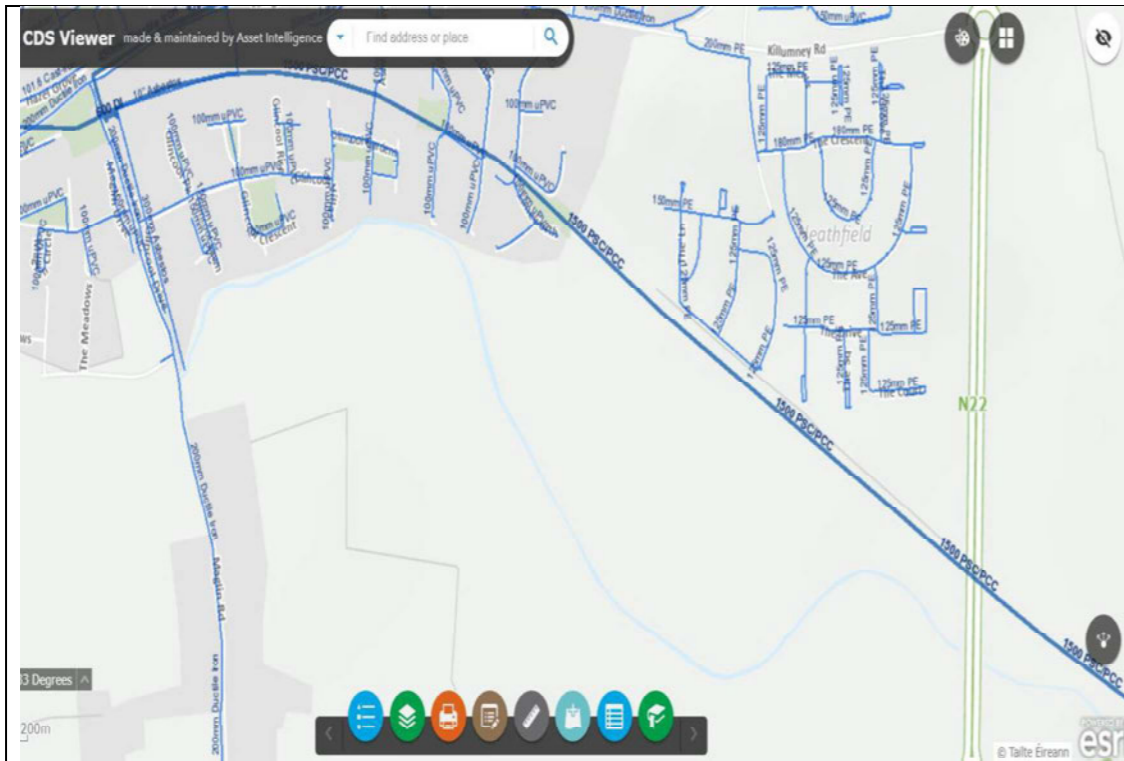
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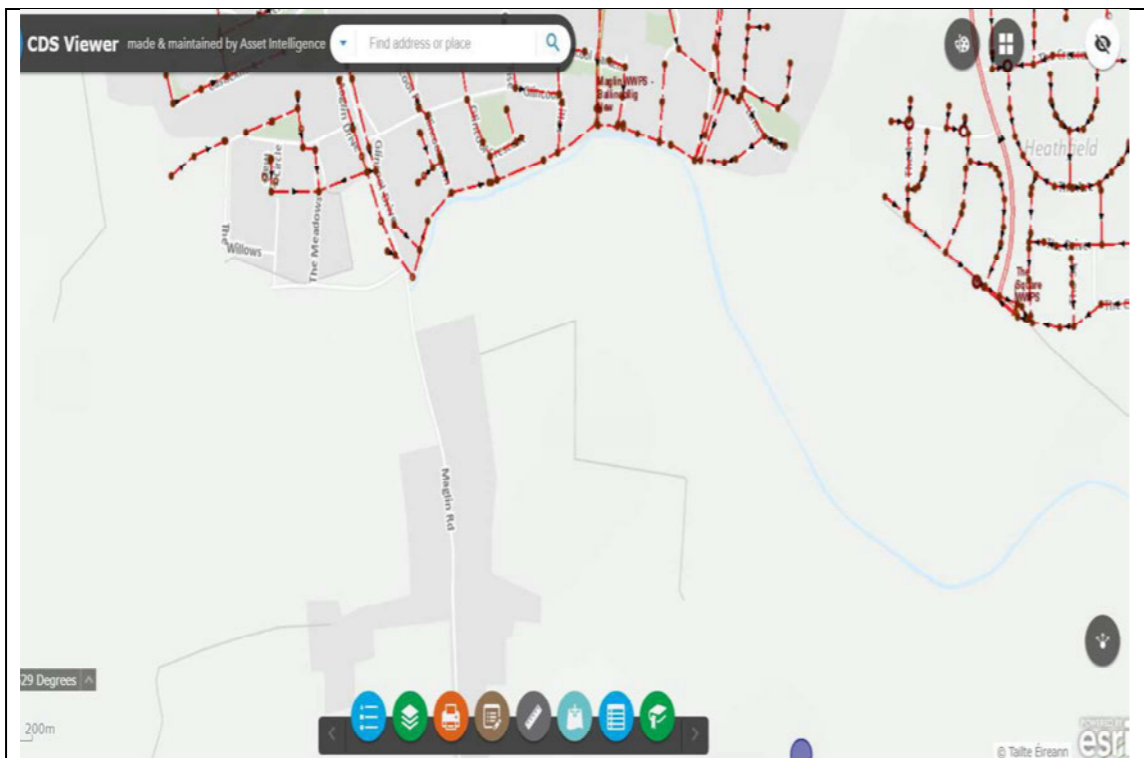
Water Distribution Network	Sewer Foul Combined Network	Surface Water Networks
Water Treatment Plant	Waste Water Treatment Plant	Surface Water Mains
Water Pump Station	Waste Water Pump Station	Surface Gravity Mains
Storage Cell/Tower	Sewer Mains Irish Water	Surface Gravity Mains Private
Dosing Point	Gravity - Combined	Surface Water Pressurised Mains
Meter Station	Gravity - Foul	Surface Water Pressurised Mains Private
Abstraction Point	Gravity - Unknown	Inlet Type
Telemetry Kiosk	Pumping - Combined	Gully
Reservoir	Pumping - Foul	Standard
Potable	Syphon - Combined	Other: Unknown
Raw Water	Syphon - Foul	Storm Manholes
Water Distribution Mains	Overflow	Standard
Irish Water	Sewer Mains Private	Backdrop
Private	Gravity - Combined	Catchpit
Trunk Water Mains	Gravity - Foul	Bifurcation
Private	Gravity - Unknown	Hatchbox
Water Lateral Lines	Pumping - Combined	Lampole
Irish Water	Pumping - Foul	Hydrobrake
Non IW	Syphon - Combined	Other: Unknown
Water Casings	Syphon - Foul	Storm Culverts
Water Abandoned Lines	Overflow	Storm Clean Outs
Boundary Meter	Sewer Lateral Lines	Stormwater Chambers
Bulk/Check Meter	Sewer Casings	Discharge Type
Group Scheme	Sewer Manholes	Outfall
Source Meter	Standard	Overflow
Unknown Meter	Backdrop	Soakaway
Non-Return	Cascade	Other: Unknown
PRV	Catchpit	Gas Networks Ireland
PSV	Bifurcation	Transmission High Pressure Gasline
Butterfly Line Valve Open/Closed	Hatchbox	Distribution Medium Pressure Gasline
Hydrobrake	Lampole	Distribution Low Pressure Gasline
Other: Unknown	Hydrobrake	ESB Networks
Other: Unknown	Other: Unknown	ESB HV Lines
Other: Unknown	Other: Unknown	HV Underground
Other: Unknown	Other: Unknown	HV Overhead
Other: Unknown	Other: Unknown	HV Abandoned
Other: Unknown	Other: Unknown	ESB MV/LV Lines
Other: Unknown	Other: Unknown	MV Overhead Three Phase
Other: Unknown	Other: Unknown	MV Overhead Single Phase
Other: Unknown	Other: Unknown	LV Overhead Three Phase
Other: Unknown	Other: Unknown	LV Overhead Single Phase
Other: Unknown	Other: Unknown	MV/LV Underground
Other: Unknown	Other: Unknown	Abandoned
Other: Unknown	Other: Unknown	Non Service Categories
Other: Unknown	Other: Unknown	Proposed
Other: Unknown	Other: Unknown	Under Construction
Other: Unknown	Other: Unknown	Out of Service
Other: Unknown	Other: Unknown	Decommissioned
Other: Unknown	Other: Unknown	Water Non Service Assets
Other: Unknown	Other: Unknown	Water Point Feature
Other: Unknown	Other: Unknown	Water Pipe
Other: Unknown	Other: Unknown	Water Structure
Other: Unknown	Other: Unknown	Waste Non Service Assets
Other: Unknown	Other: Unknown	Waste Point Feature
Other: Unknown	Other: Unknown	Sewer
Other: Unknown	Other: Unknown	Waste Structure

## Section B – Details of Uisce Éireann’s Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email [datarequests@water.ie](mailto:datarequests@water.ie)



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**APPENDIX 7-2 Confirmation of Feasibility and Statement of  
Design Acceptance**

## CONFIRMATION OF FEASIBILITY

Fiachra O Sullivan

MHL & Associates LTD  
Unit 1B, The Atrium  
Blackpool, Cork. T23T2VY

16 May 2025

**Uisce Éireann**  
Bosca OP 448  
Oifig Sheachadta na  
Cathrach Theas  
Cathair Chorcaí

**Uisce Éireann**  
PO Box 448  
South City  
Delivery Office  
Cork City

[www.water.ie](http://www.water.ie)

**Our Ref: CDS25000271 Pre-Connection Enquiry  
Maglin Lands, Maglin Road, Ballincollig, Cork**

Dear Applicant/Agent,

### **We have completed the review of the Pre-Connection Enquiry.**

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 1,142 unit(s) at Maglin Lands, Maglin Road, Ballincollig, Cork, (the **Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection**
  - Feasible Subject to upgrades
  - A new 450mm ID Watermain is required in order to serve the development. This can either be a continuation of neighbouring developments should they go ahead and subject to the relevant permissions or directly from the existing 450mm ID main to the north end of Maglin road to the development connection point & for a length of approx. 900 metres. An internal spine main of minimum 200mm ID Watermain shall be required.
- **Wastewater Connection**
  - Feasible Subject to upgrades
  - A Singular Pump Station in the area to serve this and neighbouring developments shall be required. Location of same to be identified by contingent developers to enable this and full area east of Maglin Road to be served by this pump station taking cognisance of flood plains also. The pump station shall provide for 24 hour storage to be maintained with sufficient land space to be provided for modular increase in storage up to 2700m<sup>3</sup>. Real time control to be added to the proposed pump station and linked with the existing Maglin PS.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at [www.water.ie/connections/get-connected/](http://www.water.ie/connections/get-connected/)

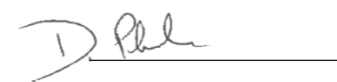
### **Where can you find more information?**

- **Section A** - What is important to know?
- **Section B** - Details of Uisce Éireann's Network(s)

**This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.**

For any further information, visit [www.water.ie/connections](http://www.water.ie/connections), email [newconnections@water.ie](mailto:newconnections@water.ie) or contact 1800 278 278.

Yours sincerely,



**Dermot Phelan**  
Connections Delivery Manager

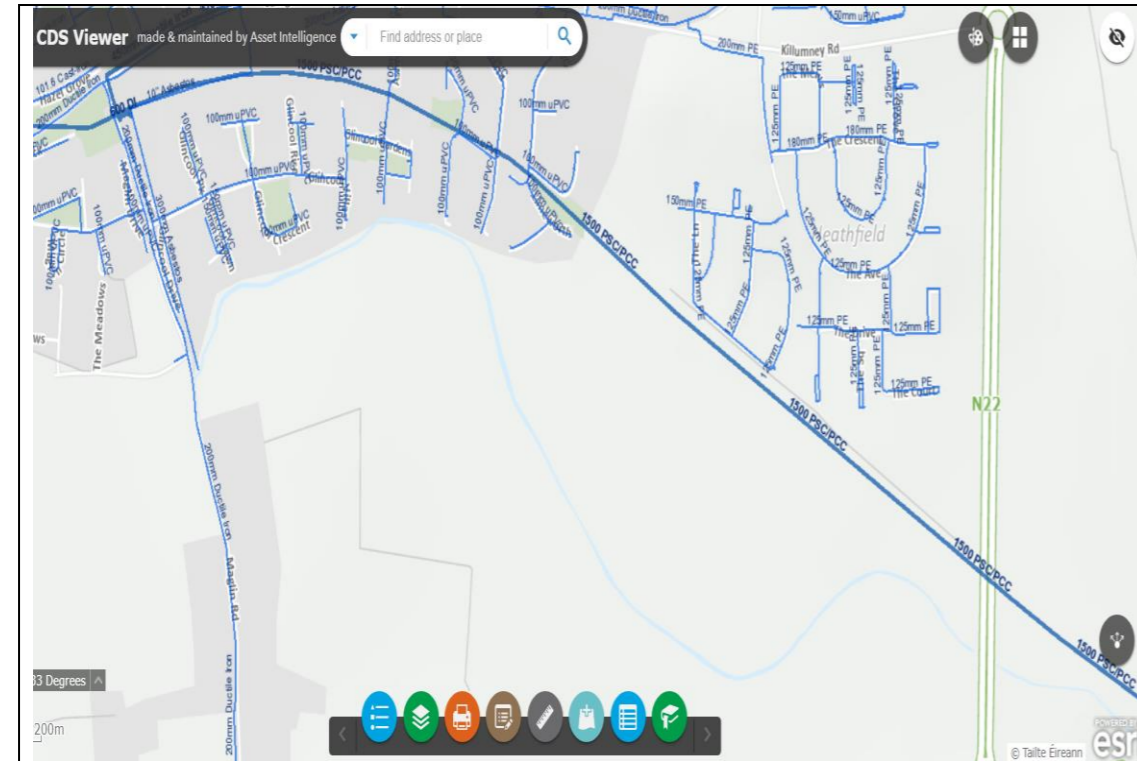
## Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	<ul style="list-style-type: none"> <li>Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s).</li> <li>Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application <u>and be granted and sign</u> a connection agreement with Uisce Éireann.</li> </ul>
When should I submit a Connection Application?	<ul style="list-style-type: none"> <li>A connection application should only be submitted after planning permission has been granted.</li> </ul>
Where can I find information on connection charges?	<ul style="list-style-type: none"> <li>Uisce Éireann connection charges can be found at: <a href="https://www.water.ie/connections/information/charges/">https://www.water.ie/connections/information/charges/</a></li> </ul>
Who will carry out the connection work?	<ul style="list-style-type: none"> <li>All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*.</li> </ul> <p>*Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works</p>
Fire flow Requirements	<ul style="list-style-type: none"> <li>The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine.</li> <li><b>What to do?</b> - Contact the relevant Local Fire Authority</li> </ul>
Plan for disposal of storm water	<ul style="list-style-type: none"> <li>The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters.</li> <li><b>What to do?</b> - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.</li> </ul>
Where do I find details of Uisce Éireann's network(s)?	<ul style="list-style-type: none"> <li>Requests for maps showing Uisce Éireann's network(s) can be submitted to: <a href="mailto:datarequests@water.ie">datarequests@water.ie</a></li> </ul>

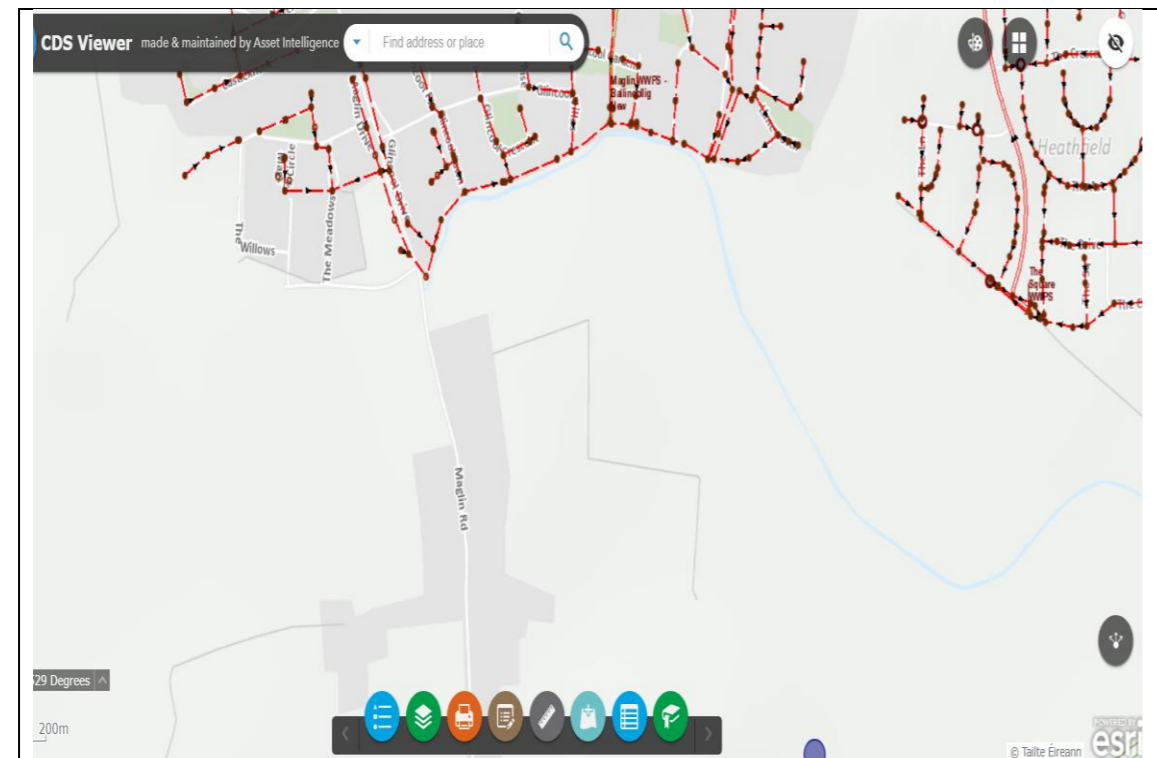
What are the design requirements for the connection(s)?	<ul style="list-style-type: none"> <li>The design and construction of the Water &amp; Wastewater pipes and related infrastructure to be installed in this Development shall comply with <i>the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice</i>, available at <a href="http://www.water.ie/connections">www.water.ie/connections</a></li> </ul>
Trade Effluent Licensing	<ul style="list-style-type: none"> <li>Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended).</li> <li>More information and an application form for a Trade Effluent License can be found at the following link: <a href="https://www.water.ie/business/trade-effluent/about/">https://www.water.ie/business/trade-effluent/about/</a></li> </ul> <p>**trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)</p>

## Section B – Details of Uisce Éireann’s Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email [datarequests@water.ie](mailto:datarequests@water.ie)



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**Note:** The information provided on the included maps as to the position of Uisce Éireann’s underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann’s network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann’s underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann’s underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Fiachra O Sullivan  
MHL & Associates LTD  
Unit 1B,  
The Atrium  
Blackpool,  
Cork  
T23T2VY

18 July 2025

**Re: Design Submission for Maglin Lands, Maglin Road, Ballincollig, Cork (the “Development”)  
(the “Design Submission”) / Connection Reference No: CDS25000271**

**Uisce Éireann**  
Bosca OP 448  
Oifig Sheachadta na  
Cathrach Theas  
Cathair Chorcaí

**Uisce Éireann**  
PO Box 448  
South City  
Delivery Office  
Cork City

[www.water.ie](http://www.water.ie)

## Appendix A

### Document Title & Revision

- [MG\_WWL\_P01 REV02 (WASTEWATER LAYOUT 1 of 8)]
- [MG\_WWL\_P02 REV02 (WASTEWATER LAYOUT 2 of 8)]
- [MG\_WWL\_P03 REV02 (WASTEWATER LAYOUT 3 of 8)]
- [MG\_WWL\_P04 REV02 (WASTEWATER LAYOUT 4 of 8)]
- [MG\_WWL\_P05 REV02 (WASTEWATER LAYOUT 5 of 8)]
- [MG\_WWL\_P06 REV02 (WASTEWATER LAYOUT 6 of 8)]
- [MG\_WWL\_P07 REV02 (WASTEWATER LAYOUT 7 of 8)]
- [MG\_WWL\_P08 REV02 (WASTEWATER LAYOUT 8 of 8)]
- [MG\_WWLS\_P01 REV01 (WASTEWATER LONGSECTION 1 of 13)]
- [MG\_WWLS\_P02 REV01 (WASTEWATER LONGSECTION 2 of 13)]
- [MG\_WWLS\_P03 REV01 (WASTEWATER LONGSECTION 3 of 13)]
- [MG\_WWLS\_P04 REV01 (WASTEWATER LONGSECTION 4 of 13)]
- [MG\_WWLS\_P05 REV02 (WASTEWATER LONGSECTION 5 of 13)]
- [MG\_WWLS\_P06 REV01 (WASTEWATER LONGSECTION 6 of 13)]
- [MG\_WWLS\_P07 REV02 (WASTEWATER LONGSECTION 7 of 13)]
- [MG\_WWLS\_P08 REV01 (WASTEWATER LONGSECTION 8 of 13)]
- [MG\_WWLS\_P09 REV01 (WASTEWATER LONGSECTION 9 of 13)]
- [MG\_WWLS\_P010 REV01 (WASTEWATER LONGSECTION 10 of 13)]
- [MG\_WWLS\_P011 REV01 (WASTEWATER LONGSECTION 11 of 13)]
- [MG\_WWLS\_P012 REV01 (WASTEWATER LONGSECTION 12 of 13)]
- [MG\_WWLS\_P013 REV02 (WASTEWATER LONGSECTION 13 of 13)]
- [MG\_WL\_P01 REV01 (WATERMAIN LAYOUT 1 of 8)]
- [MG\_WL\_P02 REV01 (WATERMAIN LAYOUT 2 of 8)]
- [MG\_WL\_P03 REV01 (WATERMAIN LAYOUT 3 of 8)]
- [MG\_WL\_P04 REV01 (WATERMAIN LAYOUT 4 of 8)]
- [MG\_WL\_P05 REV01 (WATERMAIN LAYOUT 5 of 8)]
- [MG\_WL\_P06 REV01 (WATERMAIN LAYOUT 6 of 8)]
- [MG\_WL\_P07 REV01 (WATERMAIN LAYOUT 7 of 8)]
- [MG\_WL\_P08 REV01 (WATERMAIN LAYOUT 8 of 8)]
- [MG\_WL\_P01 REV01 (WATERMAIN LAYOUT 1 of 8)]

For further information, visit [www.water.ie/connections](http://www.water.ie/connections)

*Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.*

Dear Fiachra O Sullivan,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at [www.water.ie/connections](http://www.water.ie/connections). Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU) ([https://www.cru.ie/document\\_group/irish-waters-water-charges-plan-2018/](https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/)).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the “Self-Lay Works”), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:

Name: Kyle Jackson  
Email: [kyle.jackson@water.ie](mailto:kyle.jackson@water.ie)

Yours sincerely,



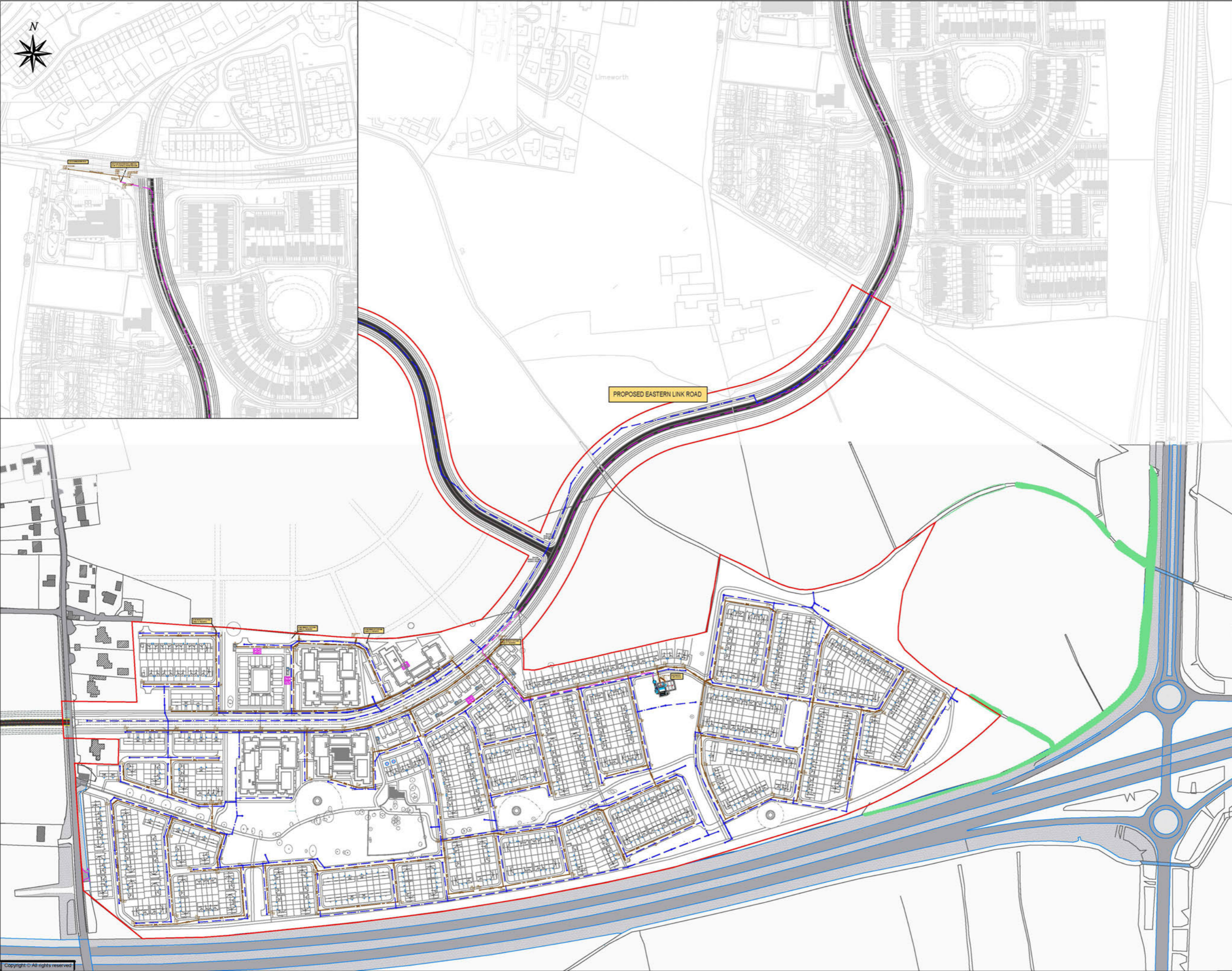
**Dermot Phelan**  
Connections Delivery Manager

**Stiúirtheoirí / Directors:** Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.

**Oifig Chláraithe / Registered Office:** Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares. Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

**APPENDIX 7-3 Proposed Wastewater Layout**



**NOTES:**  
 All dimensions in metres.  
 Do not scale from drawing.  
 For any discrepancies found please consult with design office.

**LEGEND:**  
 Development Boundary —

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Rev.	By.	Date.	Description.
02	FOS	07/25	Updated as per UE comments
01	FOS	02/07/25	Updated as per UE comments

Drawing Status: **PLANNING**

**Project Title:** Residential Development, Maglin, Ballincollig, Cork

**Drawing Title:** Wastewater Layout (1 of 8)

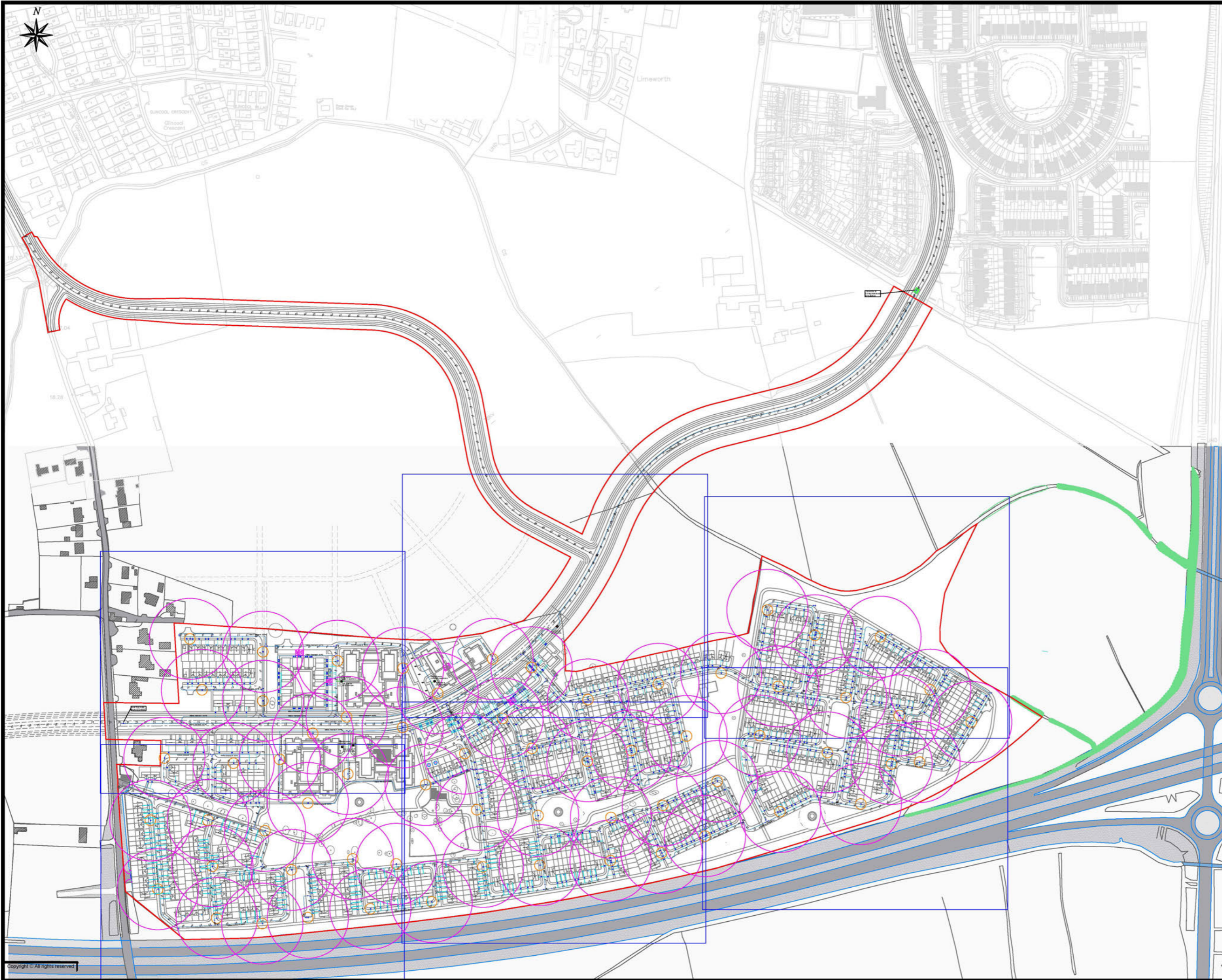
**Client:** O' FLYNN CONSTRUCTION

MHL & Associates Ltd.  
 Consulting Engineers

**MHL**  
 Carrraig Mór House,  
 10 High Street,  
 Douglas Road,  
 Cork.  
 Tel: 021-4840214  
 Web: www.mhl.ie  
 E-Mail: info@mhl.ie

<b>Designed:</b> FOS	<b>Drawn:</b> FOS	<b>Checked:</b> KM
<b>Scale:</b> 1:2,000@ A1 1:4,000@ A3	<b>Date:</b> July 2025	<b>Revision:</b> 02
<b>Job No.</b> 19069HD	<b>Drawn:</b> MG-WWL-P01	

**APPENDIX 7-4 Proposed Watermain Layout**



- Notes:**
- For any discrepancies found please consult with design office and refer to Uisce Éireann STD-W-13 for backfill and bedding detail.
  - Service layout distances to comply with Uisce Éireann Detail STD-W-11.
  - Air valve and hydrant covers, where located in grass areas, shall be surrounded by a concrete plinth, 200mm all round and 100mm deep formed with C20/25 concrete, 20mm aggregate size, bedded in Clause 804 material. The plinth shall incorporate mild steel reinforcement links and shall have a bull-nose finish around its external perimeter. See Section 3.18 of Water Code of Practice for further details.
  - All pipe connection to units to be a minimum of 25mm O.D. in accordance to Irish Water Code of Practice Section 3.7.
  - Watermain Loops to be constructed in accordance with Uisce Éireann standard detail drawing STD-W-39.
  - All watermain infrastructure to be installed and built in accordance to Uisce Éireann Code of Practice and Standard Details.

- Legend:**
- Proposed Watermain
  - Proposed 25mm outer Ø PE-80 Water Connection to Private Property (Refer to STD-W-01 & STD-W-03 Uisce Éireann Water Infrastructure Standard Details)
  - Proposed Boundary Box (Refer to STD-W-03 Uisce Éireann Water Infrastructure Standard Details)
  - Proposed Bulk Meter w/ adjoining Kiosk (Refer to STD-W-26 Irish Water Water Infrastructure Standard Details). For marker posts refer to STD-W-27 Irish Water Water Infrastructure Standard Details.
  - Proposed Air Valve (Refer to STD-W-20 to STD-W-23 Uisce Éireann Water Infrastructure Standard Details). For marker posts refer to STD-W-27 Uisce Éireann Water Infrastructure Standard Details.
  - Proposed Sluice Valve (Refer to STD-W-04 to STD-W-10 & STD-W-14 to STD-W-15 Uisce Éireann Water Infrastructure Standard Details). For marker posts refer to STD-W-27 Uisce Éireann Water Infrastructure Standard Details.
  - Proposed Fire Hydrant (Refer to STD-W-18 to STD-W-19 Uisce Éireann Water Infrastructure Standard Details). For marker posts refer to STD-W-27 Uisce Éireann Water Infrastructure Standard Details.
  - Fire Hydrant Radius 46m
  - Fire Hydrant Radius 6m
  - Proposed Washout Hydrant (Refer to STD-W-30A Uisce Éireann Water Infrastructure Standard Details). For marker posts refer to STD-W-27 Uisce Éireann Water Infrastructure Standard Details.
  - Connection Point (Refer STD-W-05 Uisce Éireann Water Infrastructure Standard Details)
  - Site Redline Boundary

Rev	By	Date	Description
01	FOS	02/07/25	Updated as per UE comments

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**Drawing Status:** PLANNING  
NOT FOR CONSTRUCTION

**Project Title:** Residential Development, Maglin, Ballincollig, Cork

**Drawing Title:** Watermain Layout Sheet 1 of 8

**Client:** O' FLYNN CONSTRUCTION

**MHL & Associates Ltd.**  
 Consulting Engineers  
 Unit 1B, The Atrium, Blackpool, Cork, T23 T2VY  
 Tel: 021-4840214  
 Web: www.mhl.ie  
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<b>Designed:</b> AO	<b>Drawn:</b> AO	<b>Checked:</b> KM
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# CHAPTER EIGHT

## MATERIAL ASSETS: WASTE

APPENDIX 8-1 Resource Waste Management Plan

**APPENDIX 8-1 Resource Waste Management Plan**

# Resource Waste Management Plan

## Proposed Large Residential Development at Maglin, Co. Cork

On behalf of

**O'Flynn Group**



MALONE O'REGAN

**Form ES - 04**



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**Resource Waste Management Plan**  
**Proposed Large Residential Development at Maglin, Co. Cork**  
**O'Flynn Group**

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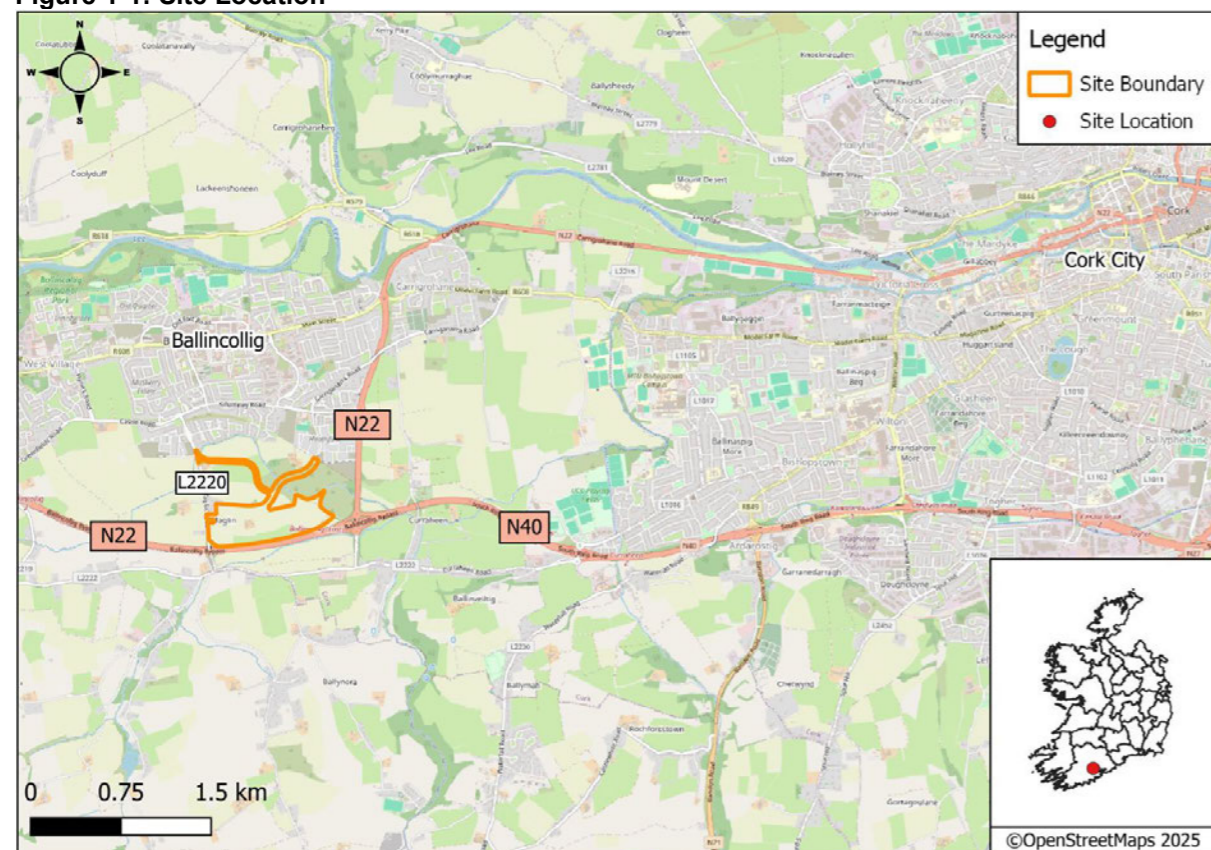
**APPENDICES**

Appendix A: Example Resource & Waste Inventory

## 1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') was commissioned by O'Flynn Group ('the Applicant') to prepare a Resource Waste Management Plan ('RWMP'). The RWMP will accompany the planning application for the proposed Large-Scale Residential Development ('LRD') and ancillary works ('the Proposed Development') at Maglin, Co. Cork (OS ITM Reference: X: 559844 Y: 569377). The location of the Proposed Development ('the Site') is shown in Figure 1-1 below.

Figure 1-1: Site Location



### 1.1 Scope and Objective

The purpose of the RWMP is to outline the manner in which construction, resources and waste will be managed throughout the Construction Phase of the Proposed Development in order to achieve compliance with the relevant waste legislation and policy. This will ensure that waste management activities at the Site will not have an adverse impact on the environment.

This RWMP has been prepared with reference to the following legislation and plans:

- The Waste Management Act, 1996 (as Amended) and Associated Regulations [1];
- The Litter Pollution Act, 1997 [2];
- The Southern Region Waste Management Plan 2015 – 2021 [3];
- Waste Action Plan for a Circular Economy 2020 – 2025 [4]; and,
- The National Waste Management Plan for a Circular Economy 2024-2030 [5].

The Guidelines recommend that planning authorities require a comprehensive RWMP to be prepared for all construction and demolition projects and that compliance with the comprehensive RWMP is a standard condition of planning permissions granted.

The comprehensive RWMP's level of detail depends on the project's scale and complexity. Developments are classified as "Tier 1" or "Tier 2" based on thresholds set out in the Guidelines.

The Proposed Development is above the following threshold:

*"New residential development of less than 10 dwellings"*

Therefore, the Proposed Development is classified as "Tier 2", requiring a bespoke comprehensive RWMP.

### 1.2 Commitment to Guidelines

This RWMP document has been prepared taking cognisance of the "Best Practice Guidelines on the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects" [6]. These Guidelines set out the best practice approach to the prevention and management of Construction and Demolition ('C&D') waste and resources from the design to the Construction Phase of a project.

The project will be carried out in accordance with the policies / objectives of the developer and the appointed contractor's resource and waste policies and procedures.

### 1.3 Environmental Policy

The project will be carried out in accordance with the policies / objectives of the developers and the appointed contractor's resource and waste policies and procedures.

#### 1.3.1 Waste Policy and Legislation

Directive 2008/98/EC [7], also known as the Waste Framework Directive, establishes an overall policy on waste in the EU. The Directive, which was incorporated into Irish law by the Waste Directive Regulations 2011 (S.I. 126/2011) [8], requires that the waste hierarchy (see Figure 1-2), which sets out the order of preference for controlling and managing waste, is central to waste management and legislation. Member States are also required to promote reuse and recycling and are obliged to reduce the percentage of waste going to landfills.

The key piece of legislation in Ireland governing waste management is the Waste Management Act 1996 [1], as amended. However, many other statutory instruments and regulations set out additional requirements regarding waste.

The waste hierarchy is encouraged throughout the Directive and will be adhered to during the Construction Phase of the Proposed Development.

Figure 1-2: Waste Hierarchy



C&D waste is the single most significant waste stream produced in Ireland in terms of both weight and volume, a total of 8.3 million tonnes was collected in 2022. Of this waste, approximately 82% consisted of soil and stones [9]. A total of 94% of the C&D waste was treated in Ireland [9].

Approximately 81% of the C&D waste from 2022 was backfilled and another ca. 10% was recycled, with only 9% being sent for final disposal [9]. Although soil and stones constituted the majority of back-filled material, substances such as concrete, brick and bituminous wastes were also recovered for backfill.

### 1.3.2 National Waste Policy and Legislation

Ireland's National Waste Policy 2020-2025: A Waste Action Plan for a Circular Economy [4] focuses on preventing waste generation and resource consumption, and extends the productive life of products and goods within Irish society and economy. The Waste Action Plan outlines methods for reducing and managing C&D waste. The Plan outlines areas in which the C&D sector will need to achieve over the coming years, and where possible, the Proposed Development will assist in reaching these objectives such as promoting waste prevention, following best available techniques and expanding the range of recycled products.

The Proposed Development has been designed to comply with waste targets specified in The National Waste Management Plan for a Circular Economy 2024-2030 [5]. The Plan has been prepared to support and supplement the wider policy base and includes specific targets, policies and actions to enable the waste and resource sector to meet the circularity challenge and accelerate the transition to a circular economy.

#### 1.3.2.1 Local Waste Policy and Legislation

The Southern Region Waste Management Plan 2015-2021 [3], operated over ten local authorities comprising Carlow, Clare, Cork County, Cork City, Limerick City & County, Kerry, Kilkenny, Tipperary, Waterford City & County, and Wexford. The Plan sets out the strategic and policy context for the region, reviews the waste management strategies implemented before its publication, and assesses waste projections and plans for future waste management strategies.

One of the goals set out in the Plan is to “reduce and where possible eliminate landfilling of all major waste streams including municipal, industrial and construction and demolition wastes in favour of the recovery of residual wastes” by 2030 [3].

### 1.4 Resource and Waste Management Objectives

The Resource and Waste Management Objectives for the construction phase of the Proposed Development are as follows:

- Preventing waste and maximising recycling and recovery of waste where possible;
- Diverting waste from landfill wherever possible;
- Prevent littering; and,
- Prevent any other environmental pollution, such as soil or water contamination.

The RWMP is a “live” document and should be reviewed and updated throughout all stages of construction.

## 2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

### 2.1 Site Context

The Site is located on a ca. 28.7195 ha site, 1.3 km south of Ballincollig town centre within the townland of Maglin. A small portion of the eastern extremity of the Site lies within the townland of Carrigrohane. The Site is approximately 10 km west of Cork City Centre.

The Site has a relatively flat topography with some sloped areas along the southern and eastern boundaries. The Site is currently accessed via Maglin Road L2220 to the west with ca. 170m of the lands fronting on to Maglin Road.

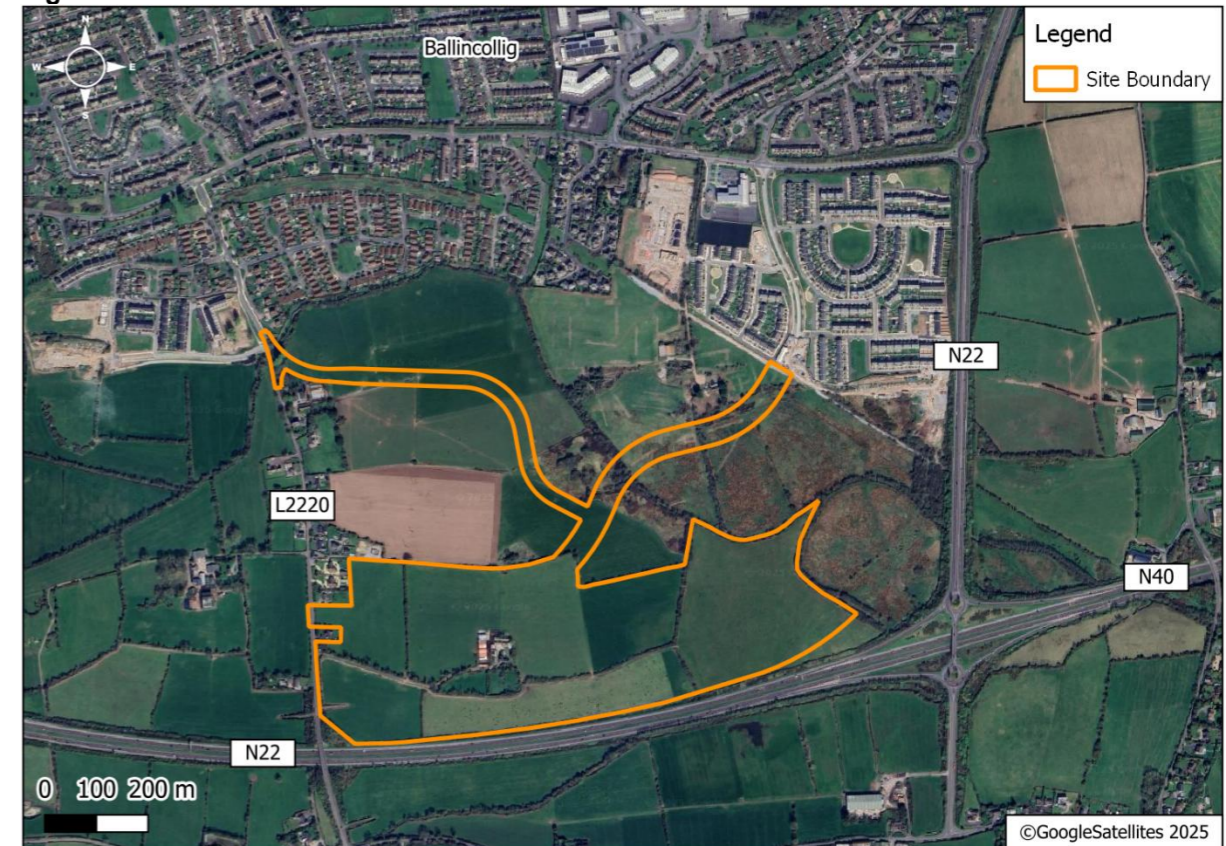
The lands comprise agricultural fields. Maglin House, a late 18th / early 19th-century house, sits centrally within the lands. The two-storey, L-shaped farmhouse is surrounded by a farmyard with associated farm buildings to the house's rear. The primary field boundaries comprise hedgerow/treelines that border the Site to the north, south, east and west, and bisect the fields. The Grange Hill River intersects the Site's northwestern and northeastern portions and borders the Site's northeastern boundary. The Maglin River borders and bisects the southeastern boundary of the Site.

A small area of mixed broadleaved woodland lies adjacent to the Grange Hill River on the southeastern branch of the Site and lies adjacent to Maglin Road on the northwestern branch of the Site.

The Site is primarily surrounded by agricultural land. The N22 National Road runs adjacent to its southern boundary, connecting the lands to Cork City's environment and major employment hubs. Residential properties are located on the Site's northwestern boundary. The area to the east of the Site is dominated by wet grassland, with a construction site for a residential housing development to the northeast.

See Figure 2-1 below.

Figure 2-1: Site Overview



### 2.2 Proposed Development

The Proposed Development will involve the creation of a new residential development to the south of Ballincollig. The Proposed Development will consist of the following:

- The demolition of an existing farmhouse and associated outbuildings;
- The refurbishment of Maglin House and the existing gate lodge;
- The construction of 1,150 residential units comprising:
  - 638 two, three and four-bed semi-detached and terraced dwelling houses;
  - 104 one and two-bed duplex units; and,
  - 408 one, two and three-bed apartments.
- A childcare facility; and,
- The provision of landscaping and amenity areas and all associated infrastructure and services including vehicular and pedestrian/cycle access, roads, parking, lighting and drainage.

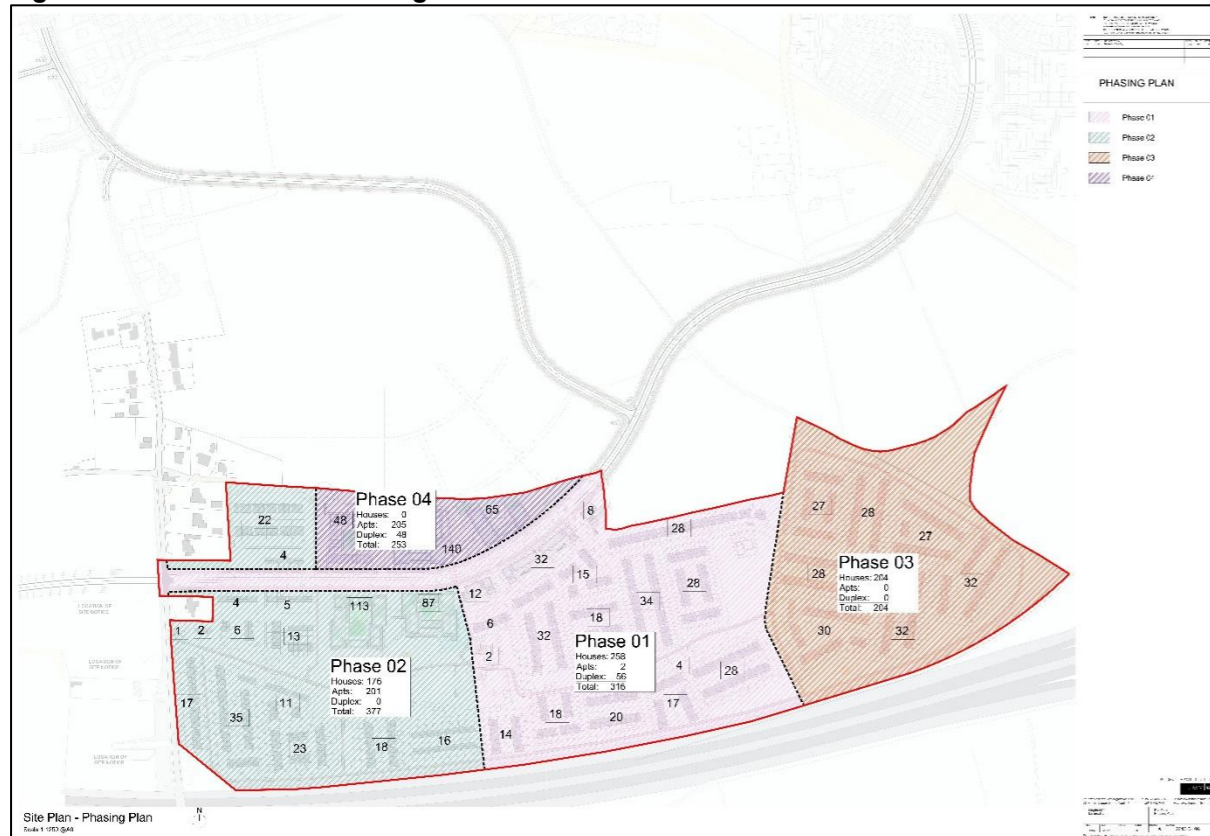
The Proposed Development will see the creation of a new residential community in this area and will promote compact growth in a location where it can be served by public transport, walking and cycling.

## 2.3 Construction

### 2.3.1 Construction Programme

The anticipated construction of the Proposed Development is expected to take ca. 10 years to complete. This will be confirmed upon the appointment of the main contractor. The Construction Phase will be broken down into separate phases outlined in Figure 2-2 below.

Figure 2-2: Construction Phasing Plan



### 2.3.2 Construction Management Plan

During the construction phase, the methods of working will comply with all relevant legislation and best practice in reducing the environmental impacts of the works. Although construction phase impacts are generally of a short-term duration and are localised in nature, the impacts will be reduced as far as practicable through compliance with current construction industry guidelines. Construction Phase times will be as follows:

- 7:30am to 18:00pm Monday to Friday;
- 7:30am to 17:00pm on Saturdays; and,
- No work on Sundays or public holidays.

Construction works outside these hours will be limited to works necessary for health and safety reasons, to protect the environment or with prior agreement with the Local Authority.

### 2.3.3 Construction Compound

To ensure the efficient management of the construction works, a temporary construction compound will be set up for the duration of the construction works. During the construction of the Proposed Development, it is expected that the Site compound will be located in the northern part of Phase 2 (to the west of Phase 4), as shown in Figure 2-2 above. The location of the compound will be confirmed before the commencement of works.

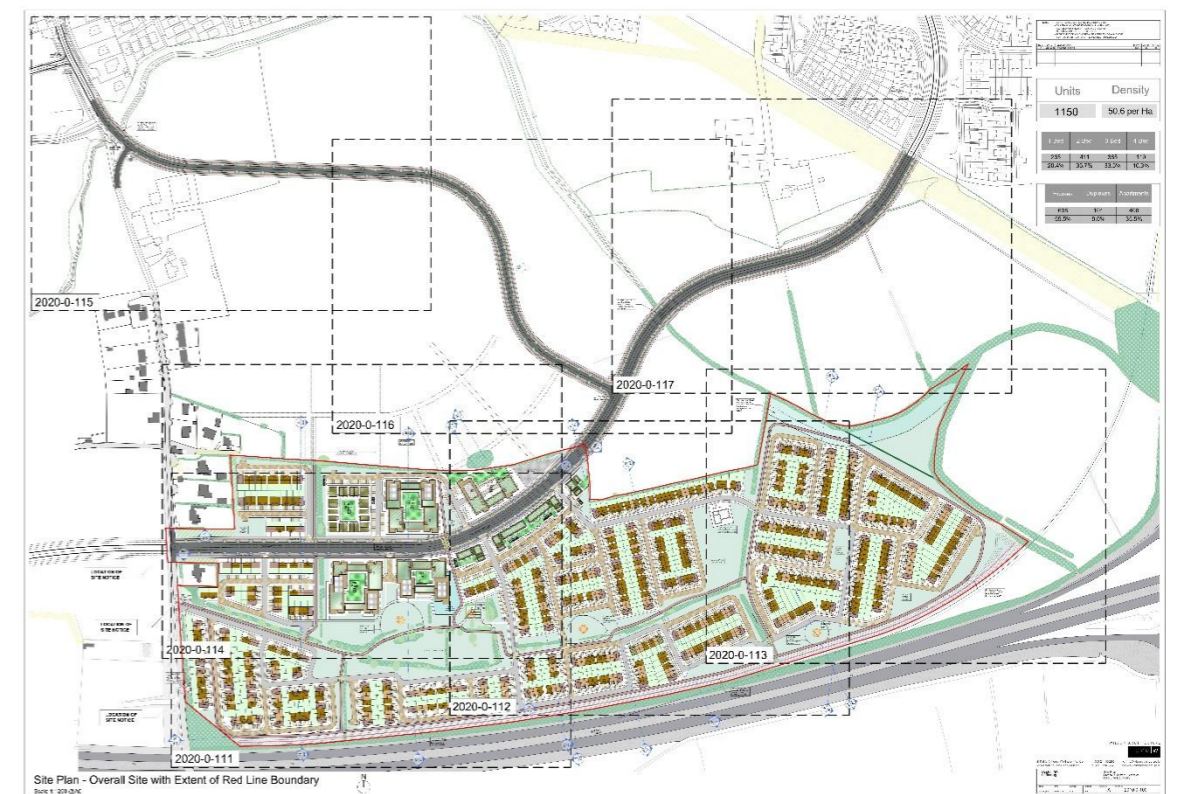
### 2.3.4 Construction and Site Traffic Access

During the initial construction works, construction vehicles, i.e., Heavy Goods Vehicles ('HGVs'), are proposed to approach via the existing Maglin Road L2220 to the west of the Site, and then through the road built as part of Phase 1 (refer to Figure 2-2 above).

### 2.3.5 Construction Waste Compound

A construction waste compound will be developed and include a range of receptacles to allow various construction waste streams to be segregated at source on-site. The location of the compound will be confirmed before the commencement of works.

Figure 2-3: Proposed Development Site Layout



## 2.4 Drainage

### 2.4.1 Surface Water Drainage

#### 2.4.1.1 Existing Surface Water Drainage

Following a desktop review of the available drainage records, along with a visual site inspection, the current drainage at the Site consists of an unnamed water feature, most likely a manmade interceptor drain ('the interceptor'), that flows through the Site from south to north discharging into the Grange Hill River at the north eastern most point of the Site. The Grange Hill River runs along the eastern boundary of the Site flowing from a north west to south east direction. Further details can be found in the drainage report submitted with this planning application.

#### 2.4.1.2 Proposed Surface Water Drainage

It is proposed that the 36.3 ha catchment is split into nine sub-catchments, as shown in Figure 2-4 below. The proposed surface water drainage system has been designed in accordance with Sustainable Urban Drainage Systems ('SuDS'). Twelve attenuation tanks in total are

proposed across the Site, with some sub-catchments designated multiple tanks acting in a daisy chain scenario. There will be two discharge points directly into the Grange Hill River, while the rest of the discharge points from the attenuation tanks will discharge either into the existing interceptor drain within the Site (which will then discharge to the Grange Hill River) or they will discharge into a swale system, which will then discharge into the interceptor drain. The proposed surface water networks will include a storm drainage pipe network and SuDS features, including nature-based features, which will aid the reduction of runoff volumes by slowing surface water flows, both providing the opportunity for evapotranspiration and rainwater storage.

Figure 2-4: Proposed Surface Water Catchment Strategy



### 2.4.2 Foul Drainage

The proposed foul drainage system will be designed to collect discharges from the new residential units in a proposed pump station. Foul drainage will be pumped from the pump station via rising main along the proposed eastern link road to a gravity sewer connection point at the main access junction to Heathfield, Ballincollig.

The foul network will be designed in accordance with Uisce Éireann's current Code of Practice for Wastewater Infrastructure Doc IW-CDS-5030-03.

## 3 RESPONSIBILITIES AND TRAINING

A member of the construction management team will be appointed as the Project Resource and Waste Manager to ensure compliant, efficient and documented resource and waste management during the construction phase. Each member of the construction staff, including subcontractors, will require training in resource and waste management procedures appropriate to their role. Each person will be responsible for complying with the RWMP and related resource and waste management procedures.

Table 3-1: Roles and Responsibilities

Role	Responsibility
Client	<ul style="list-style-type: none"> <li>Responsible for appointing and directing an appropriately qualified design team.</li> </ul>
Contractor	<ul style="list-style-type: none"> <li>Responsible for appointing a Resource and Waste Manager.</li> <li>Managing the construction phase of the project; was responsible for the project's overall environmental performance.</li> <li>Responsible for reporting incident responses and, where required, communicating the incident details to relevant regulatory authorities.</li> <li>Monitoring of the construction processes against the project objectives.</li> <li>Liaison with all staff and local stakeholders dealing with any complaints or queries from the public.</li> <li>Ensure compliance with environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the RWMP and other environmental reports.</li> </ul>
Architect, Engineer and Quantity Surveyor	<ul style="list-style-type: none"> <li>Responsible for the design of the project, including setting environmental targets.</li> <li>Liaison with the planning authority, client and contractor to ensure that requirements are communicated.</li> <li>Ensure compliance with environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the RWMP and other environmental reports.</li> </ul>
Resource and Waste Manager	<ul style="list-style-type: none"> <li>The Resource and Waste Manager will be given responsibility and authority to select a resource and waste team, if required, i.e., site staff members that will aid them in the organisation, operation and recording of resource and waste management systems on the Site. The Resource and Waste Manager will oversee, record and provide feedback to the Client on everyday waste management at the Site. Authority will be given to the Resource and Waste Manager to delegate responsibilities to sub-contractors where necessary and coordinate with suppliers, service providers and sub-contractors to prioritise on-site waste prevention and recycling.</li> <li>They will be responsible for appropriately training all relevant site personnel for their role in implementing the RWMP and related waste management procedures. These procedures will include litter prevention and mitigation measures to ensure that all waste is disposed of legally, economically, and safely.</li> <li>The Resource and Waste Manager will be required to ensure that only appropriately permitted waste collection contractors are used to collect waste from the Site.</li> <li>The Resource and Waste Manager will be trained in how to establish and maintain a waste record-keeping system, perform an audit, and establish targets for waste management onsite. They will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused onsite, and know how to implement the RWMP. They will also be responsible for conducting waste audits from time to time.</li> <li>The Resource and Waste Manager will be available for any Local Authority or other audits as required. They will also update the RWMP as required.</li> </ul>
Site staff, including sub-contractors	<ul style="list-style-type: none"> <li>It will be the responsibility of all relevant site construction / operational staff and sub-contractors to ensure that waste is segregated and stored appropriately in line with the RWMP and related waste management procedures.</li> </ul>

Role	Responsibility
	<ul style="list-style-type: none"> <li>A basic awareness course will be given to all site staff and relevant sub-contractors to outline the RWMP, to detail the segregation of waste materials at source and litter prevention requirements. This may be incorporated with other site training sessions e.g. general site induction. This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained. This may also include the provision of training and reminder material such as posters, signs and contact details for the Waste Manager or their nominated deputy.</li> </ul>

## 4 DESIGN APPROACH

### 4.1 Workshops

The scope, attendees, agenda and dates of any design out workshops will each be decided on at the contractor's tender stage. All attendees will be notified within an appropriate timeframe.

Site personnel shall be trained appropriately to ensure they are competent to perform tasks that have the potential to cause a significant environmental impact as part of the Proposed Development; refer to Section 6.1. All managers and supervisors will be briefed on the RWMP.

Method Statements will be prepared for specific activities before the work commences and will include environmental management / best practice measures and emergency preparedness appropriate to the activity covered. The Contractor's Construction Manager will review key Method Statements before their issue. Method Statement briefings will be given before personnel carry out key activities for the first time.

### 4.2 Reuse and Recycling

Reusing materials onsite will reduce the costs of transportation, disposal, and landfill levy fees, as well as a reduction in the use of virgin raw materials. Reuse and/or recovery will be used where practicable, but the scope will be limited given the proposed Site size and development. However, it will be considered during the detailed design stage.

Excavated soil and stone will be stored in segregated piles on the Site and will be removed from the Site. Subject to testing, excavated material will be sent to a C&D waste recovery facility, as Article 27 by-products (notification will be sought for reuse elsewhere) or to a landfill. The soil and stone material from the Site are expected to be minimal. This waste will be source segregated, and where necessary, hardened concrete waste will be sent to a C&D waste recovery facility and recovered for hardcore offsite. Wood material generated as part of the Site clearance will be minimal and source segregated for subsequent separation and recovery at a remote facility.

The cost of waste recycling can be lower than disposal, depending on segregation at the source for certain materials such as plastic, glass and cards. If waste streams can be segregated on-site, waste collection and management fees would be significantly reduced.

Metals are often segregated at source onsite, as some revenue can be earned from source-segregated metal. Where metal is not segregated on-site, it can be segregated at a C&D waste processing facility, and the contractor can receive a rebate against the overall cost of waste transport and disposal.

Concrete waste will be minimal and will be generated from the construction process. As the concrete waste will be the excess left over due to ordering, there will not be any reinforcing steel to recycle. Masonry waste resulting from the construction process will also be sent to a C&D waste recovery facility and recovered for hardcore off-site. It is expected that while there will be unavoidable construction waste, material surpluses and damaged materials that will need to be disposed of.

### 4.3 Green Procurement

The Resource and Waste Manager shall ensure that materials are ordered so that the quantity delivered and the storage are not conducive to the creation of unnecessary waste. The Resource and Waste Manager will be responsible for ensuring that the resource waste prevention and reduction capability and competence criteria is met using a questionnaire in the contract / tender request package. They will have expert knowledge on waste prevention and minimisation. Reviews will be required during the design process to monitor compliance with waste design principles.

Material specifications will be assessed when ordering materials and will outline the essential performance properties required of a material. During the design stage, consideration will be given to using measures such as the “Just in Time” method to prevent as much material waste as possible.

The RWMP is a working document and will need to be updated as the Proposed Development progresses. The Client will ensure that a contractual agreement is in place to implement the initiatives outlined.

#### 4.4 Offsite Construction

The use of prefabricated and precast materials will be considered in the detailed design stage, along with the consideration of modular construction.

#### 4.5 Material Optimisation

The Resource and Waste Manager shall ensure that materials are ordered so that the quantity delivered and the storage are not conducive to creating unnecessary waste. Where possible, the overall material use in the design of structures will be reduced.

During the detailed design stage of the Proposed Development, internal and external simplification of the design and layout will be considered. Where appropriate and feasible, standardising design details and materials to reduce the number of materials onsite will be considered. Consideration will also be given to material dimensions and product sizes to ensure specific design specifications and requirements are met.

#### 4.6 Flexibility and Deconstruction

During the detailed design stage of the Proposed Development, consideration will be given to using recyclable, flexible and adaptable materials for a low-waste future change of use so that materials can easily be recovered / reused should the Proposed Development undergo disassembly / deconstruction.

## 5 KEY MATERIALS, QUANTITIES AND COSTS

### 5.1 Targets

Specific resource and waste management targets for the Proposed Development have not yet been established. Targets will be set by the design phase Resource and Waste Manager on completion of the comprehensive RWMP prior to the commencement of construction. It is recommended as a minimum and in line with the Waste Directive Regulations 2011, a 70% target for the reuse, recycling and recovery of man-made C&D waste should be implemented. However, this will be agreed upon at the appointment of the main contractor and the construction phase Resource and Waste Manager.

Typical Key Performance Indicators ('KPIs') that may be used to set targets as per the Guidelines [6] include:

- Weight (tonnes) or Volume (m<sup>3</sup>) of waste generated per construction value;
- Weight (tonnes) or Volume (m<sup>3</sup>) of waste generated per construction floor area (m<sup>2</sup>);
- Fraction of resource reused on-site;
- Fraction of resource notified as a by-product;
- Fraction of waste segregated at source before being sent offsite for recycling / recovery; and,
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed of.

### 5.2 Estimates of Residual Resource / Waste Streams

In the design phase, the Resource and Waste Manager should complete a waste and materials inventory before the Construction Phase of the Proposed Development. This inventory should include the resource management route options that will be considered during the detailed design stage of the project. A template of the inventory is included in Appendix A.

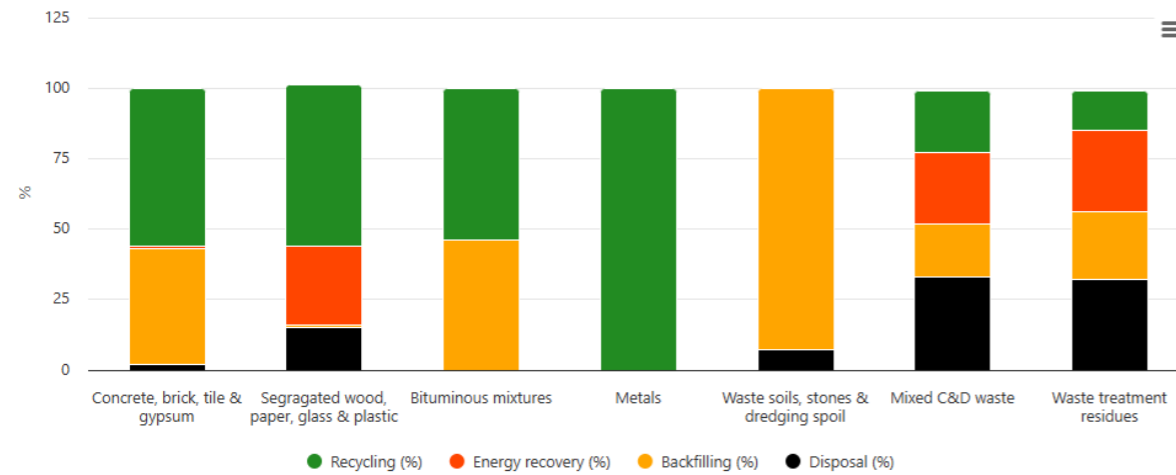
At this point, it is not possible to quantify residual resource / waste streams. However, this section details typical resource / waste streams that arise during C&D projects and possible management options.

**Table 5-1: EPA Composition of C&D Waste [10]**

C&D Waste Type	Tonnage	% of Total
Soils, stones & dredging spoil	6,741,489	82%
Concrete, brick, tile & gypsum	616,687	7%
Mixed C&D waste	544,415	7%
Metal	206,851	3%
Bituminous mixtures	104,270	1%
Segregated wood, glass & plastic	54,101	>1%
<b>Total</b>	<b>9,267,813</b>	<b>100%</b>

The EPA provides a breakdown of the proportion of different resource management routes for C&D wastes collected in Ireland [10]. These figures can be used to estimate the reuse, recovery or recycling targets in the updated RWMP for the construction phase of the Proposed Development.

Figure 5-1: EPA Statistics: Final Treatment of C&D Waste Streams in 2022 [10]



## 6 SITE MANAGEMENT

The Construction Phase Resource and Waste Manager will be responsible for ensuring that the updated RWMP is implemented during the construction phase and for delivering all training and induction relating to resource and waste management.

### 6.1 Training

The updated RWMP will be distributed to the project team, including subcontractors, to ensure the requirements are communicated effectively. Site induction training will be completed at the beginning of the construction phase and include the aims and objectives of the updated RWMP. It will also be noted that the updated RWMP will be a working document, and the Resource and Waste Manager will be required to update the document as the construction of the Proposed Development progresses. As per the Guidance [6], induction training will include the following:

- Scope and content of the updated RWMP;
- Project commitments and targets;
- List of anticipated resources and waste volumes to be generated;
- Procedures for the proper identification and segregation of resources and wastes;
- Temporary storage and the location of the waste storage areas; and,
- Clear instructions on hazardous wastes and the particular dangers of each type of hazardous waste.

### 6.2 Toolbox Talks

Toolbox talks will be scheduled regularly during the Construction Phase of the Proposed Development. They will include instruction on incident response procedures and resource management practices associated with their work.

### 6.3 Waste Collection Operators and Waste Destination Sites

The Resource and Waste Manager will ensure that all waste is handled in accordance with the Waste Management Act (as amended).

The Resource and Waste Manager will be required to ensure that only appropriately permitted waste collection contractors are used to collect waste from the Site. This will be checked on the National Waste Collection Permit Office ('NWCPO') website. Waste management contractors must provide copies of the relevant collection permit.

The Resource and Waste Manager will also be responsible for ensuring that all waste is processed and/or disposed of at a suitably licenced or permitted waste facility. The status of a facility's waste permit or Certificate of Registration ('CoR') will be checked on the NWCPO website or on the EPA website for licenced sites.

### 6.4 Resource-Efficient Supply Chains

The following best practice measures will be utilised where possible and as far as practicable:

- Select procurement routes to minimise unnecessary packaging (e.g. 'Just-in-Time' delivery process);
- Use strategically located (consolidation centres) storage and distribution facilities where materials can be stored prior to delivery;
- Prepare ordering procedures and supply chain systems that avoid waste;
- Use take-back schemes for packaging and material surplus and offcuts;

- Select procurement routes that minimise unnecessary packaging; and,
- Plan phases of work to reduce the potential for onsite residual resource generation.

## 6.5 Control of Records

Resource and waste management records will be maintained in accordance with the company's respective procedures and legal requirements. The records will be kept in either hard copy or electronic format as required by the individual procedure that the records relate to, in such a way that they are readily identifiable, retrievable and protected against damage, deterioration or loss. The records procedure also specifies the retention time for the records and who has the authority to dispose of them.

## 6.6 Records for Onsite Resource Uses

Records will be kept for waste / resource movement within the Site, i.e., excavated soil reused onsite for soil stabilisation or reinstatement / landscaping works. A system will be put in place to detail the weight and type of material, its source, and its destination within the Site.

This record system will allow the comparison of recorded waste amounts with the targets established for recovery, reuse, and recycling in the updated RWMP. It should also be linked with the delivery records and records of waste transported off-site so that the percentage of waste generated from each waste/resource stream can be established.

## 6.7 Consultation / Communication

The Contractor will define procedures for internal and external communication. During the construction phase, internal communication will include regular progress meetings, which should cover:

- Training undertaken;
- Progress reports;
- Inspections, audits and non-conformance;
- Complaints received;
- Visits by external bodies and the outcome or feedback from such visits;
- Objective / target achievement, including reporting on performance; and,
- External communication, including letter drops or meetings and liaison with statutory authorities, will be overseen by the Site Manager.

## 6.8 Auditing and Inspections

The Resource and Waste Manager will conduct audits at the Site at the end of each phase of the construction of this project. An audit plan will be prepared before the audit, when the waste management procedures and plan are being put in place at the start of the project. The audits will include the following:

### 6.8.1 Work Practice

The Resource and Waste Manager will inspect signage and waste storage infrastructure. Any required repairs or upgrades will be recorded and carried out as soon as possible. Compliance with procedures regarding segregation should be noted, and any contamination should be highlighted so that corrective action can be taken. The Resource and Waste Manager should observe (sub)contractor work practices for compliance with the updated RWMP.

### 6.8.2 Record Keeping

The Resource and Waste Manager will inspect all waste and resource records to ensure that they are readily identifiable, retrievable and protected against damage, deterioration or loss.

The resource records will be compared with established Site targets (refer to Section 5). Progress towards these targets will be analysed, and areas for improvement will be identified.

### 6.8.3 Audit Findings

The audit findings should highlight corrective actions that may be implemented in relation to management policies or site practices to reduce waste further. A tracking system will be stipulated to determine the success or failure of corrective actions.

C&D waste audit procedures and template advice, including an audit checklist and templates for waste records, are available in the European Commission [11] "*Guidelines for the waste audits before demolition and renovation works of buildings*".

## 7 SITE INFRASTRUCTURE

Waste will be segregated on-site. The storage methods and location of the Waste Storage Areas will be included in induction training and in the signage required on-site. Posters and signs onsite will include the contact details of the Resource and Waste Manager.

It is not predicted that hazardous materials will be present onsite; however, on the occasion that hazardous materials do arise, they will be segregated, classified in accordance with the LoW, and removed by a licensed waste contractor.

It is proposed to have exclusion zones and barriers between stockpiled materials and surface water features to prevent sediment washing into the receiving water environment. Consideration will be given to Article 5 of EU Regulation 2019/1021 in the unlikely event of stockpiling of certain persistent organic pollutants over 50kg, examples of such pollutants include ground contamination, EPA/XPS insulation material containing brominated flame retardant ('HBCDD') or polychlorinated biphenyls from the removal of electrical equipment.

The handling and export of resources will be further considered during the detailed design stage of the Proposed Development.

## 8 CONCLUSION

This RWMP document outlines the management procedures to enable the Appointed Project Manager to prepare and update a construction stage RWMP.

The appointed Contractor will be required to develop an updated RWMP prior to the commencement of any construction works, and this will be submitted to the Planning Authority for approval if requested.

Implementing all of the environmental management measures outlined in this RWMP will ensure that the construction programme is completed without significant adverse effects on the surrounding environment and that waste disposal is minimised.

## 9 REFERENCES

- [1] Government of Ireland, "Waste Management Act," Government of Ireland, Dublin, 1996.
- [2] Government of Ireland, "The Litter Pollution Act," Government of Ireland, Dublin, 1997.
- [3] SWR, "Southern Region Waste Management Plan 2015 - 2021," Southern Waste Region, 2017.
- [4] Government of Ireland, "Waste Action Plan for a Circular Economy," Government of Ireland, 2020.
- [5] Local Government Ireland, "The National Waste Management Plan for a Circular Economy 2024-2030," Local Government Ireland, Dublin, 2024.
- [6] EPA, "Best Practice Guidelines on the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects," EPA, 2021.
- [7] European Union, "Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives," EU, 2008.
- [8] Government of Ireland, "Waste Directive Regulations," Government of Ireland, Dublin, 2011.
- [9] EPA, "National Waste Statistics Summary Report for 2022," Environmental Protection Agency, September 2024. [Online]. Available: <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/>. [Accessed 22 May 2025].
- [10] EPA, "Construction & Demolition Waste Statistics for Ireland,," Environmental Protection Agency, September 2024. [Online]. Available: <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/>. [Accessed 22 May 2025].
- [11] EPA, "Guidelines for the waste audits before demolition and renovation works of buildings,," 2018. [Online]. Available: [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjcZ9G8zOWHAXWYU0EAHRd3DGkQFnoECBMQAQ&url=https%3A%2F%2Fec.europa.eu%2Fdocsroom%2Fdocuments%2F31521%2Fattachments%2F1%2Ftranslations%2Fen%2Frenditions%2Fnative&usg=AOvVaw2tvcn\\_NTCNiJ](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjcZ9G8zOWHAXWYU0EAHRd3DGkQFnoECBMQAQ&url=https%3A%2F%2Fec.europa.eu%2Fdocsroom%2Fdocuments%2F31521%2Fattachments%2F1%2Ftranslations%2Fen%2Frenditions%2Fnative&usg=AOvVaw2tvcn_NTCNiJ). [Accessed 08 08 2024].

## APPENDIX A

## 1 RESOURCE AND WASTE INVENTORY TEMPLATE

Table 1-1: Resource and Waste inventory template

LoW Code	Description	Volume Generated (tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes) (waste)	Recovered (tonnes) (waste)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Total Cost (€)
17 01 01	Concrete								
17 01 02	Bricks								
17 01 03	Tiles and Ceramics								
17 02 01	Wood								
17 02 02	Glass								
17 02 03	Plastic								
17 03 02	Bituminous mixtures								
17 04 01	Copper, Bronze, Brass								
17 04 02	Aluminium								
17 04 03	Lead								
17 04 04	Zinc								
17 04 05	Iron and Steel								

LoW Code	Description	Volume Generated (tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes) (waste)	Recovered (tonnes) (waste)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Total Cost (€)
17 04 06	Tin								
17 04 07	Mixed Metals								
17 04 11	Cables								
17 05 04	Soil and Stone								
17 06 04	Insulation Material								
17 08 02	Gypsum								
17 09 04	Mixed C&D waste								

# CHAPTER NINE

## LAND, SOILS AND GEOLOGY

APPENDIX 9-1	IGI EIS Guideline Matrices
APPENDIX 9-2	Old OSI Maps and Aerial Photos
APPENDIX 9-3	VCL Walkover Photographs
APPENDIX 9-4	GSI Soil & Subsoil Maps
APPENDIX 9-5	Priority Geotechnical Interpretive Report
APPENDIX 9-6	GSI Bedrock and Vulnerability Maps
APPENDIX 9-7	EPA Licensed Industrial Emissions Map

**APPENDIX 9-1 IGI EIS Guideline Matrices**

Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.1 – IGI EIS Guideline Matrices**

**Figure 1** Flow Chart



**Figure 2** Activities /Environments Matrix

Activities								
	Earthworks	Storage / transmission of leachable and/or hazardous materials	Lowering of groundwater levels by pumping or drainage	Discharges to ground	Excavation of materials above the water table	Excavation of materials below the water table	Land-spreading	Abstraction / Discharge of energy (heat) from/to the ground
<b>Type A</b>	Invasive site works to characterise nature <sup>1</sup> and thickness of soil and subsoil e.g. trial pits or augering.	Establish nature and quantity of leachable materials.	Establish details of borehole /spring construction or drainage system structure details (as appropriate).	Complete a Risk Assessment as per EPA (2011) Guidance on the Authorisation of Discharges to Groundwater <sup>2</sup> ; Apply Tier 1, 2 or 3 Assessment as appropriate	Site works to characterise nature <sup>1</sup> , thickness, permeability and stratification of soils and subsoils e.g. trial pits, augering.	Site works to characterise nature <sup>1</sup> , thickness, permeability and stratification of soils and subsoils e.g. trial pits, augering.	Establish the type of waste to be landspread.	Provide details of type of system (open/closed, shallow/deep). The site works required and described below will reflect the design parameters of the system being installed.
	Site works to characterise nature <sup>1</sup> , thickness, permeability and stratification of soils, subsoils and bedrock geology e.g. trial pits, boreholes.	Site works to characterise nature <sup>1</sup> , thickness, permeability and stratification of soils, subsoils and bedrock geology e.g. trial pits, boreholes.	Establish sustainable yield and proposed daily abstraction rate or drainage system invert levels (as appropriate).		Site works to fully characterise the bedrock geology and in order to define the resource volume/weight according to The PERC Reporting Standard <sup>3</sup> e.g. trenching, drilling, geophysics.	Site works to fully characterise the bedrock geology and in order to define the resource volume/weight according to The PERC Reporting Standard <sup>3</sup> e.g. trenching, drilling, geophysics.	Undertake a walkover survey of the site.	Site works to characterise nature <sup>1</sup> , thickness, permeability and stratification of soils, subsoils and bedrock geology.
	Works to determine groundwater level, e.g. mapping, monitoring in stand pipes, piezometers, or boreholes.	Works to determine groundwater level, e.g. mapping, monitoring in stand pipes, piezometers, or boreholes.	Works to determine summer level of the water table, annual actual recharge and proposed maximum drawdown. Measurement of effects of change in water level on nearby abstractions.		Works to determine groundwater level, flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	Works to determine groundwater level, flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	Review Groundwater Protection Responses for Landspreading <sup>4</sup> , and apply Departmental and Regulatory guidelines and best practice.	Design parameters for the system will be required to be collected, however these are out of the remit of this document although any information gathered for design purposes should be used in the EIS.
<b>Type B</b>	<i>In addition to all the above;</i> Works to determine groundwater level, flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	<i>In addition to all the above;</i> Works to determine groundwater flow direction and gradient; e.g. monitoring in stand pipes, piezometers, or boreholes.	<i>In addition to all the above;</i> Works to determine aquifer properties, seasonal variations in water levels, extent of cone of depression or drawdown of surrounding water levels (as appropriate) and alterations in groundwater flow pattern.	<i>As above;</i>	<i>As above;</i>	<i>As above;</i>	<i>In addition to all the above;</i> Site works to characterise subsoil/soil characteristics e.g. trial pits or augering.	<i>In addition to all the above;</i> Characterise baseline temperature of soil / groundwater and hydrochemistry and quality.  Works to determine groundwater level e.g. monitoring in stand pipes, piezometers, or boreholes.  If it is proposed to discharge to surface water, then characterisation of surface water quality, baseline temperature and flow rates.
<b>Type C</b>	<i>In addition to all the above;</i> Identify location and abstraction rate of nearby groundwater abstractions.	<i>In addition to all the above;</i> Measure or determine rate of groundwater flow/travel time.	<i>In addition to all the above;</i> Installation of sufficient monitoring wells to provide groundwater flow direction, gradient, flow pattern and rate of flow/travel time.  Identify nearby geothermal systems, and discharges to groundwater	<i>As above;</i>	<i>As above;</i>	<i>As above;</i>	<i>In addition to all the above;</i> Confirm subsoil permeability in laboratory. Delineate inner and outer source protection areas and source protection zones.  Establish water quality of groundwater abstraction. Undertake risk assessment if appropriate.	<i>In addition to all the above;</i> Works to determine thermal and hydraulic conductivity of soil, subsoil and bedrock.  Identify location and abstraction rate of nearby groundwater abstractions.
<b>Type D</b>	<i>In addition to all the above;</i> Regional study of karst in an area, including identified karst features (both mapped and identified during site walkovers).  Map bedrock topography.  Geotechnical assessment of risk of landslide or subsidence.	<i>In addition to all the above;</i> Full detailed hydrogeological assessment required in this situation.  Geotechnical assessment of risk of landslide or subsidence.	<i>In addition to all the above;</i> Geotechnical assessment of risk of landslide or subsidence.	<i>In addition to all the above;</i> Geotechnical assessment of risk of landslide or subsidence.	<i>In addition to all the above;</i> Full detailed hydrogeological assessment required in this situation.	<i>In addition to all the above;</i> Full detailed hydrogeological assessment required in this situation.	<i>As for Type C above</i>	<i>In addition to all the above;</i> Geotechnical assessment of risk of landslide or subsidence.
<b>Type E</b>	Full detailed hydrogeological assessment required in this situation.	Full detailed hydrogeological assessment required in this situation.	Full detailed hydrogeological assessment required in this situation.	Complete a Risk Assessment as per EPA (2011); Apply Tier 1, 2 or 3 Assessment as appropriate.	Full detailed hydrogeological assessment required in this situation.	Full detailed hydrogeological assessment required in this situation.	<i>As for Type C above</i>	Full thermogeological and/or hydrogeological assessment required in this situation.

- Type A Passive geological / hydrogeological environments
- Type B Natural dynamic hydrogeological environments
- Type C Man-made dynamic hydrogeological environments
- Type D Sensitive geological / hydrogeological environments
- Type E Groundwater dependent eco systems

Where works are required to characterise, establish, measure, determine or otherwise provide information, the level of activity and detail required will be informed by a combination of a) the potential impact of the proposed development, b) the scale of the proposed development and c) the professional judgement of the project geoscientist. In addition, the works are likely to be iterative, with new works required in response to information acquired during any phase of works.

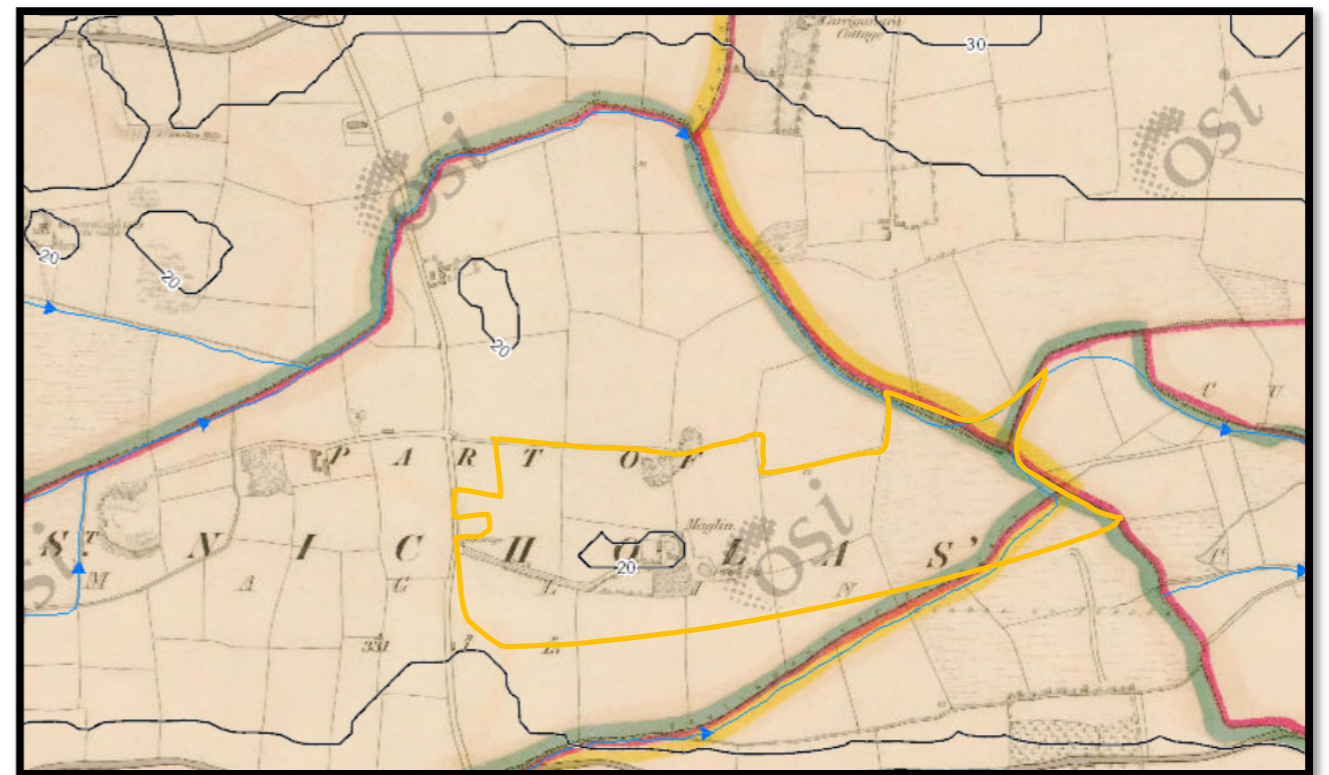
- 1 Characterisation of soil and sub-soils to be carried out in accordance with a recognised standard or nomenclature system e.g. B55930:1990 for subsoils or EPA Code of practice for Environmental Risk Assessment for Unregulated Waste Disposal sites where relevant
- 2 EPA, 2011. Guidance on the Authorisation of Discharges to Groundwater - Version 1 December 2011. www.epa.ie
- 3 The PERC Reporting Standard
- 4 Groundwater Protection Schemes (DoELG/EPA/GSI, 1999)
- 5 Control of Farm Pollution (DAFF, 1992) and the Code of Good Agricultural Practice to Protect Waters from Pollution by Nitrates (DoE and DAFF, 1996)
- 6 Landspreading of Organic Waste - Guidance on Groundwater Vulnerability Assessment of Land (EPA 2004)

**APPENDIX 9-2 Old OSI Maps and Aerial Photos**

Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.2 – Old OSI Maps and Aerial Photos**



**Image 9.2.1: Modern aerial photo of Maglin site area (orange boundary) under agricultural use. (Approximate routes of proposed New Access Roadways shown by orange lines.)**



**Image 9.2.2: Old OSI 1840's 6" Map – with walled garden and pond beside Maglin House. Note quarry feature (with lime kiln) located in the central part of the northern boundary.**

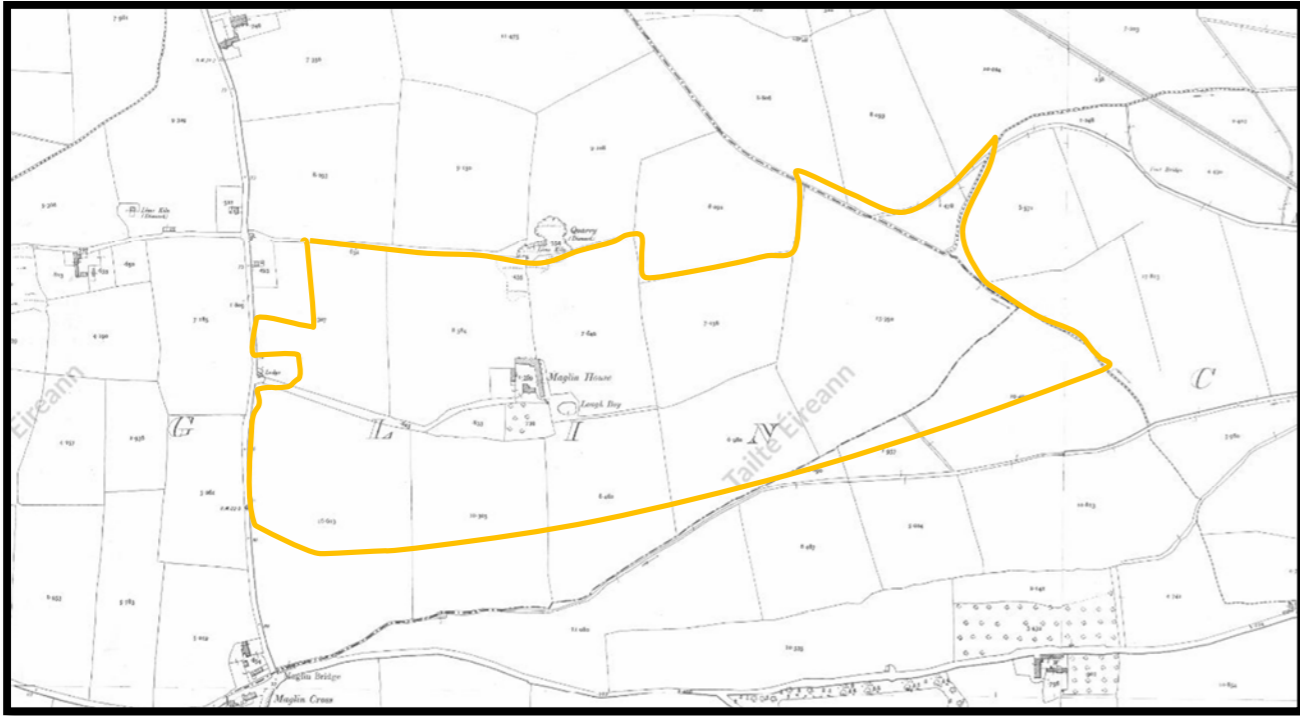


Image 9.2.3: Old OSI early 1900's 25" Map – Farm House, Pond & Walled Garden & Quarry visible.

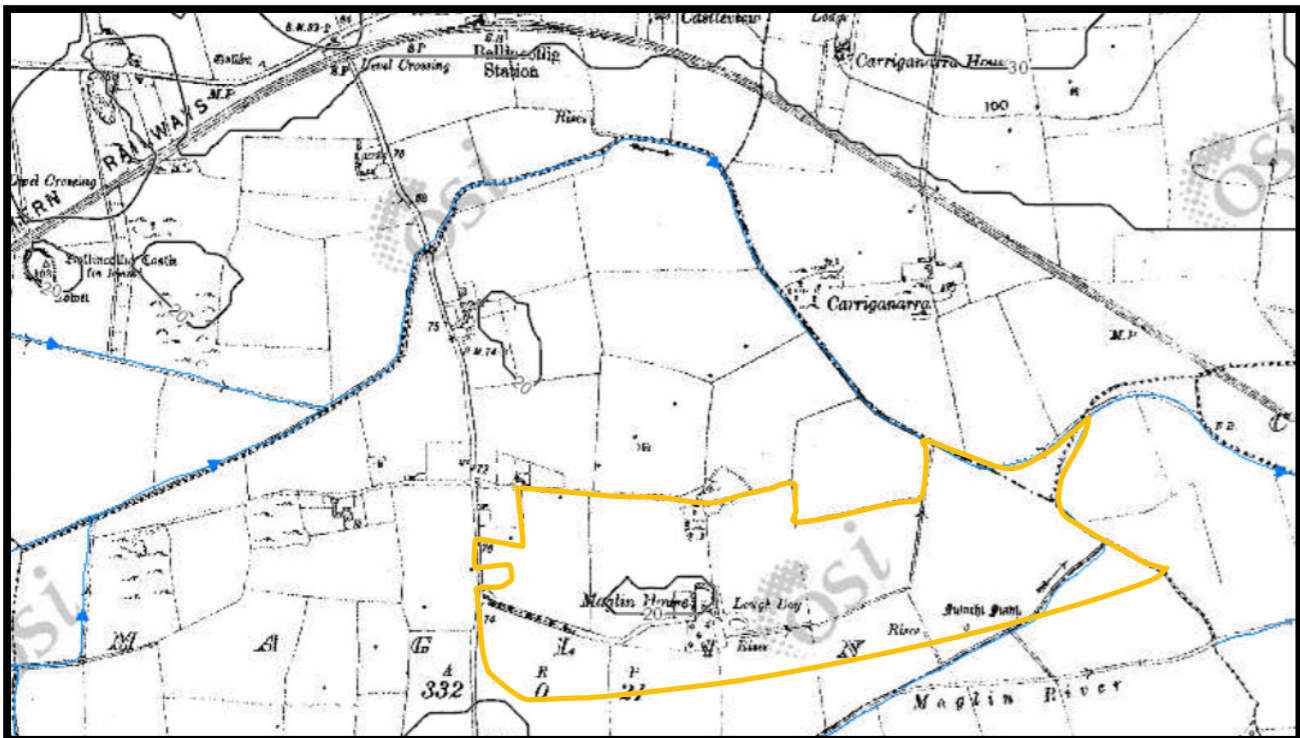


Image 9.2.4: Old OSI early 1900's 25" Map with contours and water courses highlighted.

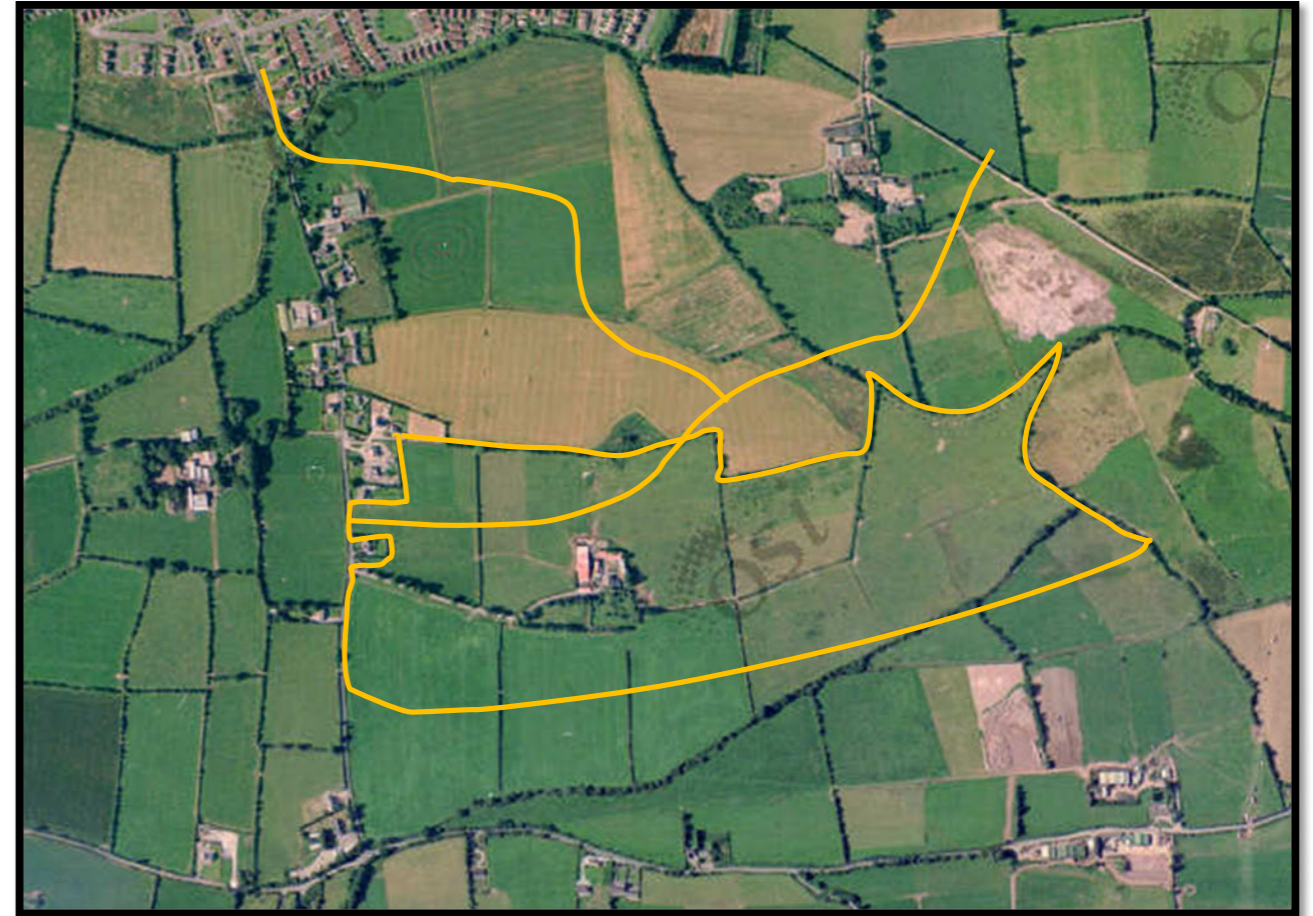


Image 9.2.5: ~1996 Aerial photo of Maglin site area (pre motorway) under agricultural use.

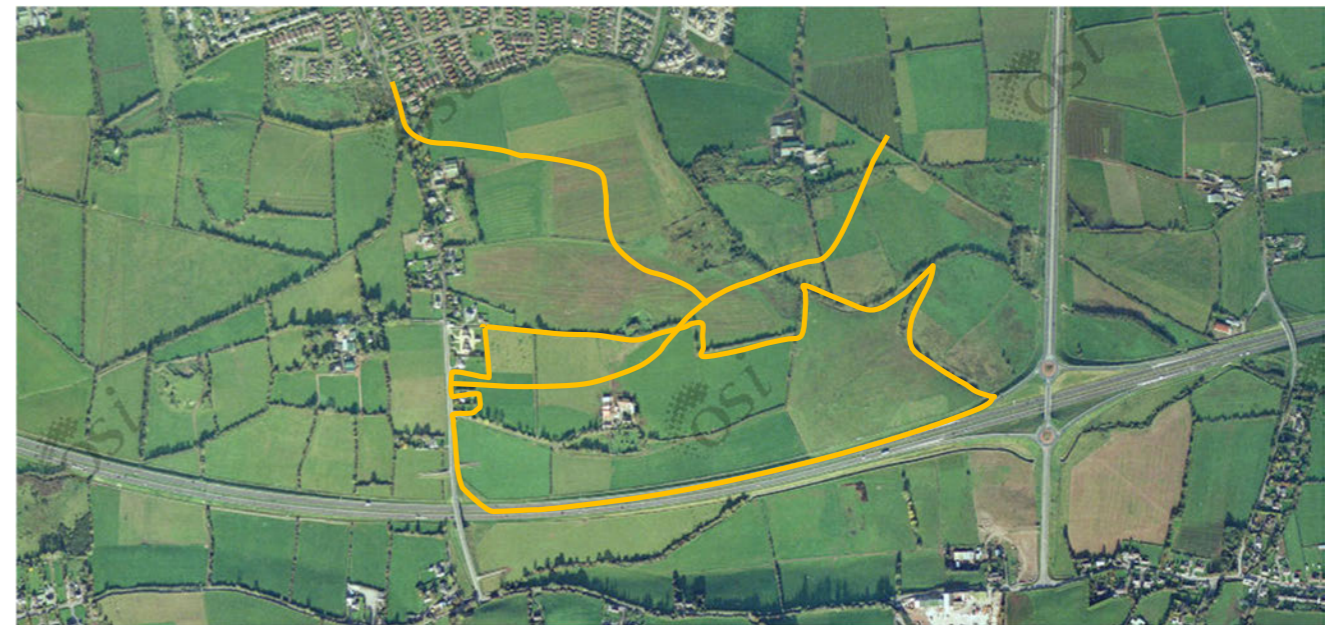


Image 9.2.6: ~2005 aerial photo of Maglin site area (post motorway) under agricultural use.

**APPENDIX 9-3 VCL Walkover Photographs**

Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.3 – VCL Walkover Photographs**



Photo 9.3.1: View East of site access and old gate lodge on Maglin Rd. on western boundary.



Photo 9.3.2: View SE of large open field that occupies the southern part of the site.



Photo 9.3.3: View SW of the western end of south field which has the motorway on its southern boundary, (note the Maglin Rd. bridge over the motorway in background, (arrow)).



Photo 9.3.4: View west of field in NW part of site which is adjacent to the western boundary.



Photo 9.3.5: View NW of field in NW part of the site. Houses along Maglin Rd in background.



Photo 9.3.6: View North of west end of the main field on the north side of the site.  
(Note the existing houses of the southern edge of Ballincollig Town in the distance.)



Photo 9.3.7: View East along the large open field that occupies the southern side of the site.



Photo 9.3.8: View East further along the large that occupies the southern side of the site.



Photo 9.3.9: View of the west end of the southern field. Note how the ground rises in the next field – this is the eastern field that has been backfilled with subsoil from the motorway.



Photo 9.3.9: View West back across the open field that occupies the south side of the site.



Photo 9.3.11: View east across the eastern field area. The whole area is raised up.



Photo 9.3.12: View along an old fence line in the eastern portion of the east field.



Photo 9.3.13: View NE into 'the point' on the eastern boundary of the site.



Photo 9.3.14: View East along the northern boundary into 'the point' on the east boundary. (Note the 'Grange Hill' watercourse (arrow) that forms the northern boundary in this area.)



Photo 9.3.15: View NW along the mature hedge in the north eastern corner of the east field.



Photo 9.3.16: View north across the watercourse to low lying ground on the opposite side. (Note the new housing development on the south side of Ballincollig in the background.)



Photo 9.3.17: View of the Grange Hill watercourse that forms the NE site boundary.



Photo 9.3.18: View north across the watercourse to low lying ground on the opposite side.



Photo 9.3.19: View of the Grange Hill watercourse that forms the NE site boundary.



Photo 9.3.20: View North of NE corner of the eastern field where the drain meets the river.



Photo 9.3.21: View of access from the eastern field to the east end of the north field.



Photo 9.3.22: View west from east end of the north field. North farm in background (arrow).



Photo 9.3.23: View south of hedge line at widest part of the northern field. Farm on far right.



Photo 9.3.24: View N-NE across the old quarry area which is very overgrown.



Photo 9.3.29: View north across old quarry and lime kiln area which is very overgrown.



Photo 9.3.25: View of livestock in the northern field with farm yard area in back ground.  
(Note that this part of the site is likely to have been part of the old quarry but is backfilled.)



Photo 9.3.26: Old out houses and sheds in farm yard area on north side of Maglin House.



Photo 9.3.27: View of Maglin House from access road. Gate to walled garden on left.



Photo 9.3.28: View north along the outer west wall of the walled garden south of the house.

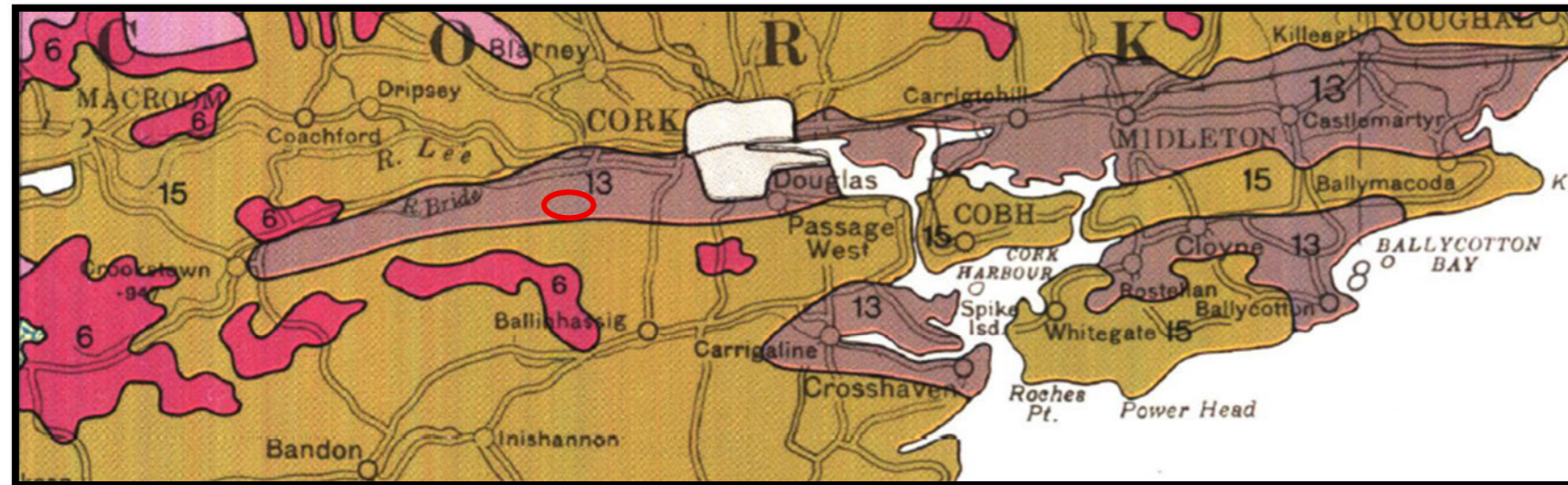


Photo 9.3.29: View NE of western end of the large north field around the old farm yard.  
This area has the highest point (23m OD) in the site area.

**APPENDIX 9-4 GSI Soil & Subsoil Maps**



Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.4 – GSI Soil & Subsoil Maps**



Broad Physiographic Divisions	Soil Association			Parent Material	Per cent of total area
	Nos.	Principal Soil	Associated Soils		
Rolling Lowland	12	Acid Brown Earths (70%) (Coarse texture)	Gleys (25%) Podzols (5%)	Mostly granite or rhyolite glacial till	1.13 2.50
	13	Acid Brown Earths (70)	Grey Brown Podzolics (15) Gleys (15)	Mixed sandstone, limestone glacial till	1.69 1.40
	14	Acid Brown Earths (75)	Gleys (15) Brown Podzolics (10)	Ordovician – Silurian – Cambrian shale glacial till	4.22 4.32
	15	Brown Podzolics (60)	Acid Brown Earths (20) Gleys (20)	Sandstone, Lower Avonian shale glacial till	6.31 5.23

Image 9.4.1 – An Foras Talúntais Soils Mapping, with approximate study area shown by red oval shape and Association 13 description highlighted.

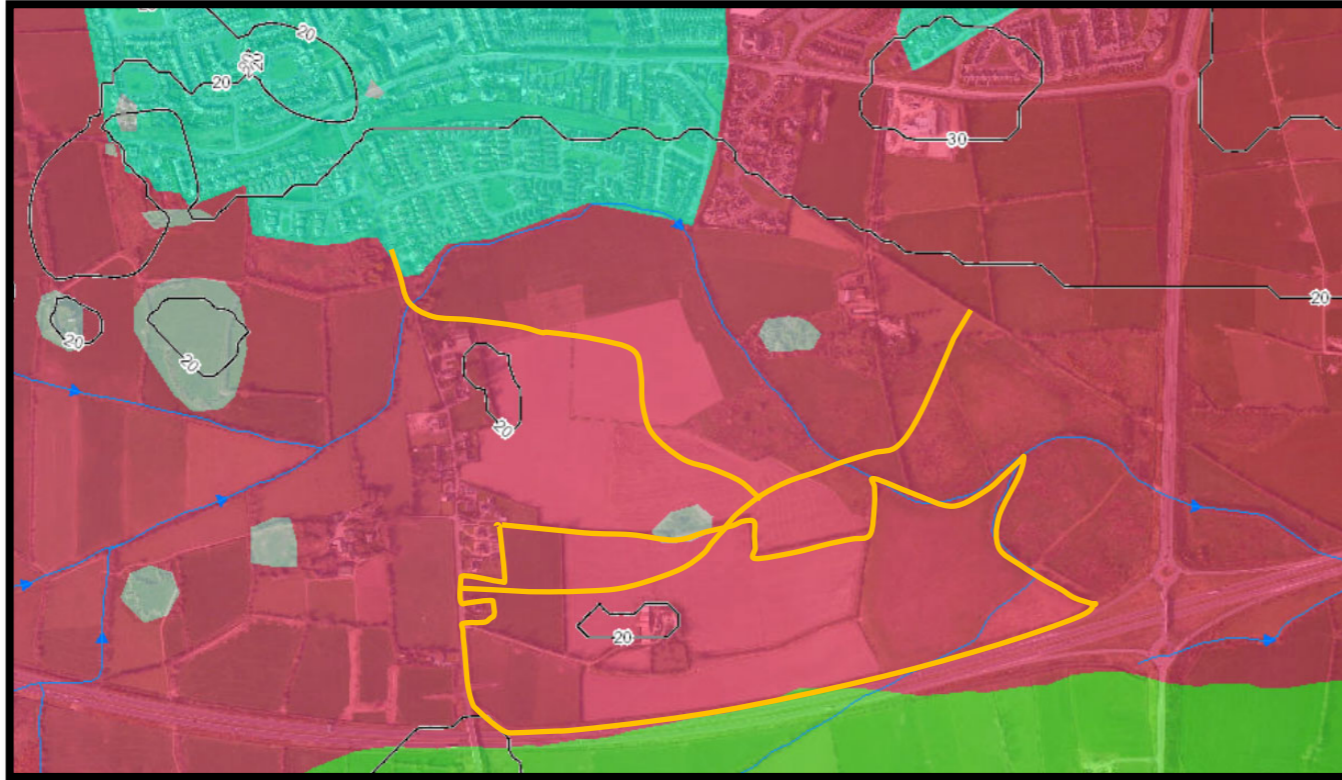


Image 9.4.2 - GSI Subsoil Map underlain by Glacial Tills (red), with gravels to south (green) and bedrock outcrop (grey). Site area is shown by the red line shape and new access roads shown by orange lines.

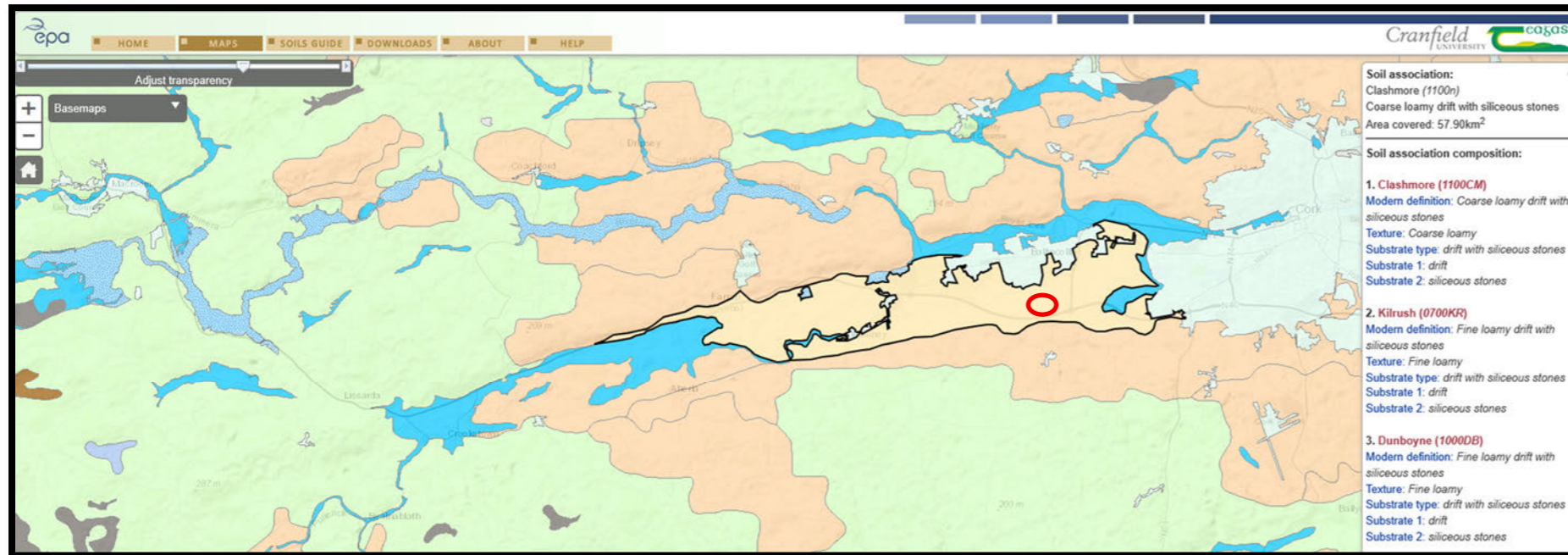


Image 9.4.3: Clashmore Soil Association Mapping from EPA web site – approximate location of the Maglin study area location shown by red circle.

(Clashmore Soil Description from the Cranfield/EPA/Teagasc Soil Association web site is attached below.)

**SERIES: CLASHMORE (1100CM) - REPRESENTATIVE PROFILE DESCRIPTION - PDF version available**

**Reference profile:** RPQ60GJ01  
**Weather:** Overcast

**LAND USE**  
**Land use:** Grassland improved  
**Human technologies:** Fertilizer applications



**TOPOGRAPHY**  
**Position:** Lower slope  
**Form:** Concave  
**Aspect:** SSE

**ROCK OUTCROPS** - (-)

**SURFACE STONE** - (-)

**PARENT MATERIAL**  
**Substrate type:** Drift  
**Substrate subgroup:** Siliceous stones

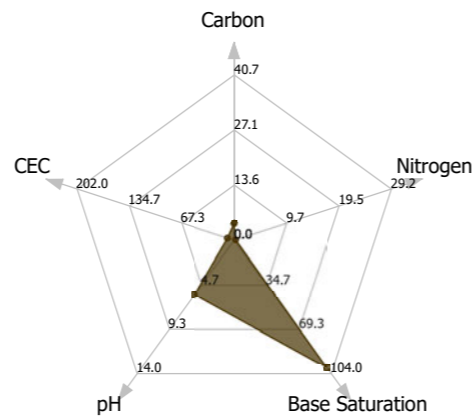
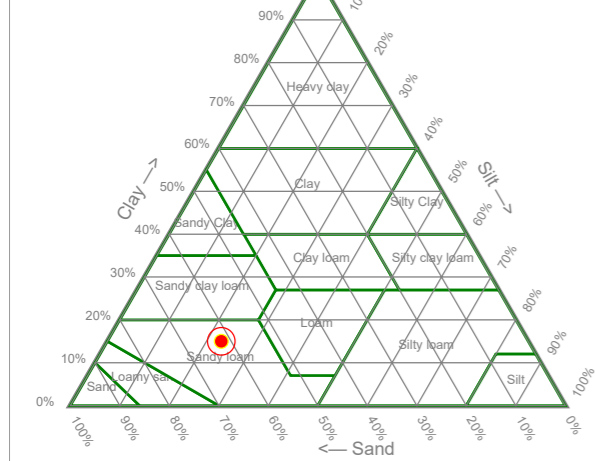
**IRISH CLASSIFICATION (2013)**  
**Soil subgroup:** 1136 Humic-stagnic Brown Earths  
**National Soil Series:** Clashmore  
**Definition:** Coarse loamy drift with siliceous stones

**TEXTURAL CRITERIA**  
**Texture 1:** Fine loamy  
**Texture 2:** -

[Download a PDF version of this profile description here](#)

**TOPSOIL ATTRIBUTES (Horizon 1)**

USDA soil texture triangle



**Horizon 1: 0 - 23 cm**

**Humose:** Yes  
**Matrix colour (moist):** 75YR31  
**Texture:** Fine loamy

**Stones (% total):** Common (5-15 %)  
**Stones details:** Fine gravels (2-6 mm)  
**Stickiness:** Non-sticky

**HCL reaction:** No reaction  
**Packing density:** Low  
**Plasticity:** Plastic

**TOTAL %**  
**Nitrogen:** 0.30  
**Carbon:** 4.17  
**Organic carbon:** 3.66  
**Loss on ignition:** -

**PARTICLE SIZE %**  
**Sand:** 62%  
**Silt:** 23%  
**Clay:** 15%

**Textural Class (USDA):** Sandy Loam  
**Bulk density:** -  
**pH:** 5.69

**EXCHANGEABLE COMPLEX**  
**Exchangeable Bases (cmol kg<sup>-1</sup>):**  
**Na:** 0.08  
**K:** 0.15  
**Mg:** 0.25  
**Ca:** 8.02

**CEC (cmol kg<sup>-1</sup>):** 8.58  
**Base saturation:** 99%

**Horizon 2: 23 - 26 cm**

**Humose:** No  
**Matrix colour (moist):** 5YR62  
**Texture:** Fine loamy

**Stones (% total):** Common (5-15 %)  
**Stones details:** Fine gravels (2-6 mm)  
**Stickiness:** Non-sticky

**HCL reaction:** No reaction  
**Packing density:** Low  
**Plasticity:** Slightly plastic

**TOTAL %**  
**Nitrogen:** 0.11  
**Carbon:** 1.28  
**Organic carbon:** 1.02  
**Loss on ignition:** -

**PARTICLE SIZE %**  
**Sand:** 52%  
**Silt:** 31%  
**Clay:** 17%

**Textural Class (USDA):** Loamy/Sandy Loam  
**Bulk density:** -  
**pH:** 5.70

**EXCHANGEABLE COMPLEX**  
**Exchangeable Bases (cmol kg<sup>-1</sup>):**

**CEC (cmol kg<sup>-1</sup>):** 4.36

**Na:** 0.08  
**K:** 0.09  
**Mg:** 0.15  
**Ca:** 3.18

**Base saturation:** 80%

**Horizon 3: 26 - 47 cm**

**Humose:** No  
**Matrix colour (moist):** 75YR53  
**Texture:** Fine loamy

**Stones (% total):** Common (5-15 %)  
**Stones details:** Fine gravels (2-6 mm)  
**Stickiness:** Sticky

**HCL reaction:** No reaction  
**Packing density:** Low  
**Plasticity:** Very plastic

**TOTAL %**  
**Nitrogen:** 0.10  
**Carbon:** 1.06  
**Organic carbon:** 0.64  
**Loss on ignition:** -

**PARTICLE SIZE %**  
**Sand:** 61%  
**Silt:** 25%  
**Clay:** 14%

**Textural Class (USDA):** Sandy Loam  
**Bulk density:** -  
**pH:** 5.54

**EXCHANGEABLE COMPLEX**  
**Exchangeable Bases (cmol kg<sup>-1</sup>):**  
**Na:** 0.08  
**K:** 0.09  
**Mg:** 0.10  
**Ca:** 2.24

**CEC (cmol kg<sup>-1</sup>):** 3.82  
**Base saturation:** 66%

**Horizon 4: 47 - 140 cm**

**Humose:** No  
**Matrix colour (moist):** 5YR53  
**Texture:** Fine loamy

**Stones (% total):** Abundant (40-80 %)  
**Stones details:** Fine gravels (2-6 mm)  
**Stickiness:** Slightly sticky

**HCL reaction:** No reaction  
**Packing density:** Medium  
**Plasticity:** Slightly plastic

**TOTAL %**  
**Nitrogen:** 0.04  
**Carbon:** 0.26  
**Organic carbon:** 0.10  
**Loss on ignition:** -

**PARTICLE SIZE %**  
**Sand:** 63%  
**Silt:** 26%  
**Clay:** 11%

**Textural Class (USDA):** Sandy Loam  
**Bulk density:** -  
**pH:** 5.61

**EXCHANGEABLE COMPLEX**  
**Exchangeable Bases (cmol kg<sup>-1</sup>):**  
**Na:** 0.08  
**K:** 0.07  
**Mg:** 0.07  
**Ca:** 1.07

**CEC (cmol kg<sup>-1</sup>):** 1.98  
**Base saturation:** 64%

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**APPENDIX 9-5 Priority Geotechnical Interpretive Report**

Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.5 – Priority Geotechnical Interpretive Report**

Our Ref: JMcS/Rp\_Int/P19223 + attachments (\*.pdf)

11<sup>th</sup> March, 2020

**Messrs.** MHL Consulting Engineers

Carrig Mor House

10 High St,

Douglas Road,

Ballinlough,

Cork.

**Re: O'Flynn Group Site Ballincollig, Cork, Preliminary Ground Investigation, Interpretative Report**

**Introduction**

In October 2019, Priority Geotechnical (PGL) were requested by MHL Consulting Engineers on behalf of their Client O'Flynn Group to undertake a ground investigation for a proposed residential development at Ballincollig, Cork.

**Scope**

The scope of the preliminary ground investigation, which was specified by MHL Consulting Engineers, comprised of the following:

- Rotary boreholes;
- Trial pit excavations;
- Dynamic probing;
- All associated sampling;
- Laboratory testing and
- Associated reporting.

## Objectives

The investigation in so far as the scope allowed, was to assess the ground and groundwater conditions present within the site; summarising the findings and results of both field and laboratory investigations, make observations on the ground and groundwater conditions encountered and to advise on foundations (bearing capacities) and other geotechnical aspects that may be relevant to the proposed outline, development.

This report presents a summary of the factual data and the geotechnical interpretation of same for the proposed residential development at the site in Ballincollig, Cork. This report should be read in conjunction with the exploratory and laboratory test data accompanying the separate factual report.

## Site Works

This investigation was carried out between the 24<sup>th</sup> October, 2019 and the 11<sup>th</sup> February, 2020 under the supervision of PGL, Engineering Geologist(s) in accordance with the contract specification: Eurocode 7- Geotechnical Design Part 2, ground investigation and testing (BS EN 1997-2: 2007) and the relevant British Standards BS 5930 (2015) Code of Practice for Site Investigation +A2:2010 and BS 1377, Method of Tests for Soil for Civil Engineering Purposes, *in situ* Tests Parts 1 to 9). Details of the plant and equipment used are detailed on the relevant exploratory records, attached.

## Rotary boreholes

Four (4) rotary boreholes were bored to a depth 11.0m below ground level (bgl) to 20.5m bgl using PGL's Deltabase 520, 6t rotary rig. The records accompany the separate factual report and are discussed herein.

## Trial Pits

Twenty five (25) trial pits were excavated to depths 2.0m bgl to 4.3m bgl using 8t tracked excavator. The records accompany the separate factual report and are discussed herein.

## Sampling

A total of ninety five (95) bulk disturbed samples (B) were recovered from the exploratory holes in accordance with Geotechnical Investigation and Sampling – Sampling Methods and Groundwater Measurements (EN ISO 22475-1:2006).

## Survey and Drawings

The exploratory locations were set out subject to work space restrictions and available access. The 'as built' exploration locations were subsequently surveyed using Trimble 5700/5800 GPS equipment to the Ordinance Survey Irish Transverse Mercator (ITM) system of co-ordinates and elevations to Malin Head datum. The 'as built' exploratory locations plans, drawing ref: P19223-SI-A, P19223-SI-01 and P19223-SI-02 are accompanying this report, for reference.

## In-Situ Testing

### Standard Penetration Test

Twenty eight (28) number standard penetration tests,  $N_{SPT}$  values, were typically carried out in the boreholes using the 60° solid cone (CPT) in place of the standard split barrel sampler. The Standard Penetration Test was carried out in accordance with Geotechnical Investigation and Testing, Part 3 Standard penetration test, BS EN ISO 22476-3:2005+A1:2011. The data is presented on the exploratory logs accompanying the factual report, summarized graphically and discussed herein.

### Dynamic probing

PGL's Competitor dynamic probing rig was to undertake dynamic probing (DP (H); 50kg drop weight, 500mm drop height) in general accordance with Geotechnical Investigation and Testing, Part 2, Dynamic probing, BS EN ISO 22476-2:2005. The blows per 100mm ( $N_{100H}$ ) were recorded to refusal being 25blows without progress over 100mm. Twenty three (23) number dynamic probes progressed to refusal at depths between 0.86m bgl to 7.31m bgl. The data is presented in the factual report, summarized graphically and discussed herein.

### Plate Load Tests

Four (4) number Plate load tests to determine California Bearing Ratio (CBR) were undertaken at 0.5m bgl and 1.5m bgl using a 450mm diameter plate and 8t tracked

excavators for reaction, in accordance with EC7 Geotechnical design Pt. 2, ground investigation and testing, EN 1997-2:2001 (E), Cl. 4.11, Plate loading test (Annex K). The data is presented in the factual report and discussed herein.

### Laboratory Testing

Laboratory testing was scheduled by PGL on behalf of MHL Consulting Engineers and carried out in accordance with BS1377 (1990), Methods of test for soils for civil engineering purposes. Specialist chemical testing was undertaken by Chemtest Ltd. (UK) on behalf of PGL. The laboratory data accompanies the factual report and was summarised as follows;

### SUMMARY OF LABORATORY TESTING

Type	Nr.	Remarks
Natural Moisture Content	19	12% to 24%
Atterberg Limits	10	Liquid Limit, LL 26% to 42%
		Plastic Limit, PL 15% to 26%
		Plasticity Index, PI 11 to 16
Particle Size Distribution	14	02Nr. hydrometer analysis on fine soils
pH	10	7.1 to 8.5
Sulphate (water soluble as SO <sub>4</sub> )	10	<0.010g/l & 0.020g/l
Total sulphur	10	<0.010% to 0.030%
Sulphate (acid soluble)	10	<0.010% & 0.037%
Organic matter	10	<0.40% to 1.2%

### Ground and groundwater conditions

The full details of the ground conditions encountered are provided for on the exploratory records accompanying this report. The records provide descriptions, in accordance with BS 5930 (2015) and Eurocode 7, Geotechnical Investigation and Testing, Identification and classification of soils, Part 1, Identification and description (EN ISO 14688-1: 2002),– Identification and Classification of Soil, Part 2: Classification Principles (EN ISO 14688-2:2004) and Identification and Classification of Rock, Part 1: Identification & Description (EN ISO 14689-1:2004) of the materials encountered, in situ testing and details of the samples taken, together with any observations made during the ground investigation.

Groundwater was recorded when encountered during boring over a period of 20 minutes, noting any changes that may occur. Groundwater levels were also monitored at start and end of drilling shifts.

Groundwater was noted during the site investigation within the depth of the investigation at a depth 0.6m bgl to 7.0m bgl. It should be noted that the normal rate of boring may not permit the recording of equilibrium groundwater levels for any one groundwater water strike where casing may exclude low volume flow as the borehole progresses.

Groundwater conditions observed in the excavations and boreholes, are those appertaining to the period of the investigation. Groundwater levels may be subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc. The groundwater regime should be assessed from standpipe well installations, where available. Under the scope of works, no standpipes were installed. A summary of groundwater is presented as follows and detailed on the exploratory records, herein.

The boreholes and exploratory pits were backfilled with their arisings and bentonite grout.



## Geotechnical Review

The following geotechnical review provides an overview of the ground conditions identified within the site along with the general characterisation of the deposits encountered. The following sections should be read in conjunction with the exploratory records and the proposed construction details/ plans.

### Desk Study - Published Geology

The Geological Survey of Ireland, 1:100,000 mapping (Sheet 25) was reviewed to determine the geology of the site. The geology of the area is defined by five major units. Furthest south lies the Gyleen Formation (GY) described as Upper Devonian red Sandstone with Mudstone and Siltstones towards the top of the unit. The Old Head Sandstone Formation (OH) lies immediately south and is characterised by Upper Devonian flaser bedded Sandstone and Minor Mudstone. This is followed by the relatively minor Castle Slate Member of the Kinsale Formation (KNcs) described as grey black slaty Mudstone. Next lies the Cuskinny Member (KNcu), defined by Dinantian flaser bedded Sandstone and Mudstone. This is followed by Waulsortian Limestones (WA) described as massive unbedded Lime-mudstone. Furthest north lies the Little Island Formation (LI) comprised of Massive and crinoidal fine Limestone.

Teagasc subsoil mapping showed the area is underlain by glacial tills derived from Devonian Sandstones. The national groundwater vulnerability mapping indicated the area is of moderate to high vulnerability. Historic borehole ID: 1405NEW141 described depth to bedrock at 8.5m.

### Ground model

The ground model was such that Topsoil where described 200mm to 900mm thick. Made Ground was described as (slightly) sandy (slightly) gravelly CLAY/ SILT with varying Cobble content and BOULDERS. Made Ground extended to depths 1.4m below ground level (bgl) up to a depth 4.2m bgl. This was underlain by mixed glacial deposits of soft to firm, (slightly) sandy (slightly) gravelly CLAY with varied Cobble content(s) to depths 3.2m bgl to 4.3m bgl. Clayey/ silty sandy GRAVEL with varying Cobble content(s) were encountered locally to depths 1.25m bgl to 4.0m bgl. The ground model was informed by rotary boreholes below a depth of 4.2m bgl and consisted of mixed glacial deposits.

SAND and GRAVEL deposits were described <sup>1</sup> by the rotary driller, being present to 5.5m bgl to 8.5m bgl. This was underlain by cohesive deposits (slightly) sandy (slightly) gravelly CLAY/ SILT to depths 8.5m bgl to 16.0m bgl. Granular deposits overlay LIMESTONE bedrock which at depths 5.7m bgl to 17.5m bgl. The bedrock profile was varied.

Groundwater was encountered between 0.6m bgl and 7.0m bgl during the period of works, typically within the interval 1.0m bgl to 3.7m bgl.

### Geotechnical Risk Register

The site was characterized as geotechnical category GC-1.

*Category 1 contains only small and simple structures. There is a negligible risk for life and property. Some examples of structures of category 1 are structures with a design column load less than 250kN and design wall load less than 100kN, retaining walls and excavation which does not exceed the 2m and small excavations for pipes and drainage (Orr and Farrell, 1999).*

Particular geotechnical risks were identified, as follows:

- Made ground; SK02, TP08, TP09, TP10, TP11, TP12, TP14, TP15, TP16 and TP22 1.2m up to 3.9m thick underlying Topsoil deposits. The Made ground was poorly defined where the presence of coarse Boulder inclusions limited *in situ* testing.

Location	From m bgl	To	Thickness, m
TP22	0.2	1.4	1.2
SK02	0.0	1.5	1.5
TP11	0.2	2.2	2.0
TP14	0.2	3.1	2.9
TP10	0.2	3.3	3.1
TP08	0.3	4.0	3.7
TP09	0.3	4.1	3.8
TP16	0.4	4.2	3.9
TP12	0.2	4.1	3.9
TP15	0.2	4.1	3.9

<sup>1</sup> Driller's descriptions should be taken as reference only.

- Shallow groundwater, <2.5m bgl;

Location	Groundwater remarks
TP08	0.60m: Slow flow rate.
TP07	1.00m: Slow flow rate.
TP06	1.60m: Steady flow rate.
TP17	1.30m: Trickle flow rate. 2.70m: Steady flow rate.
TP14	2.00m: Fast rate of flow.
TP03	2.40m: Steady rate of flow
TP27	2.40m: Slow flow rate.

- Irregular rock profile

Location	Depth to bedrock, m bgl	Bedrock details
RC01	14.3	Strong, light grey, LIMESTONE. Highly fractured and not intact rock.
RC02	17.5	Strong, grey LIMESTONE. Slightly weathered, Some discolouration. Oxidation. Clay smearing from 19.00m to 20.50mm.
RC03	10.0	Strong, grey white, LIMESTONE. Slightly weathered. Fractures planar smooth.
RC04	5.7	Strong, light grey, LIMESTONE. Slightly weathered with light clay smear on some fracture surfaces. Moderately to heavily fractured, though mostly solid and intact, with close to medium spaced fractures, planar rough to undulate rough.

and

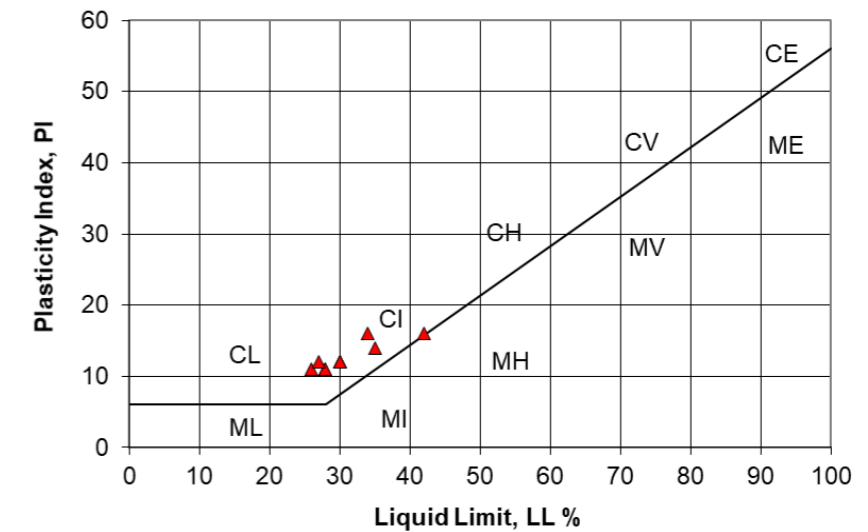
- Soft deposits to depths 1.9m bgl to 3.8m bgl: DP16, DP17, DP18, DP19, DP21, DP23, DP24, DP25, DP26, DP27, DP28 and DP30; TP04, TP07, TP17, TP18, TP20, TP21, TP23, TP24 and TP26.

It is noted there was some level of correlation between the soft ground and presence of 'shallow' groundwater.

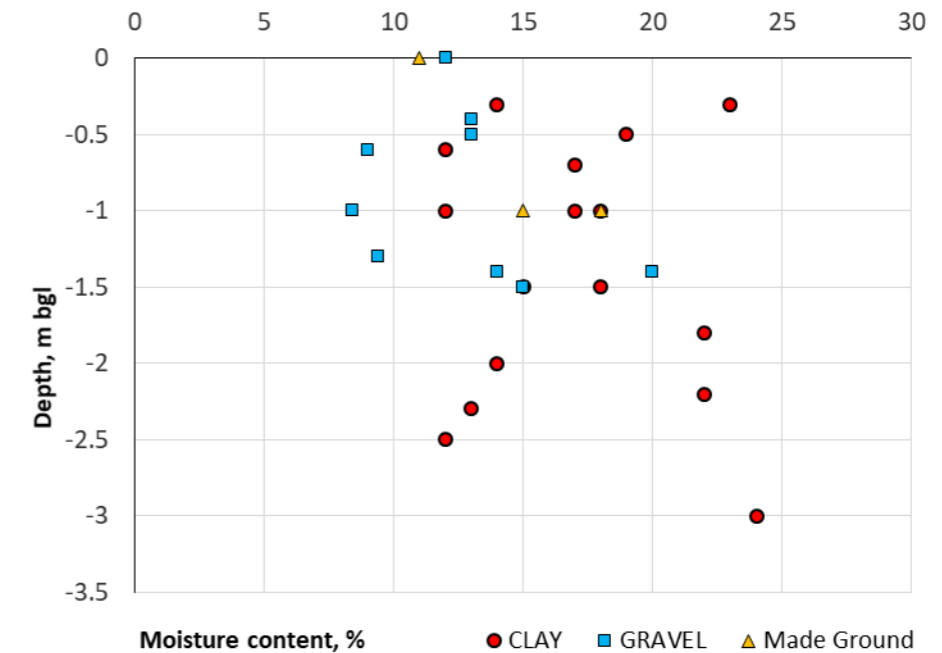
### Characteristic properties

The mixed glacial deposits were of low to intermediate plasticity (CL – CI/ MI) and characterised by moisture contents ranging from 9% to 24%. Grading analysis indicated a fines fraction (Clay/ Silt) 8% to 49%; Sand fraction 10% to 34%; Gravel 23% to 72% with low to medium Cobble contents (3% to 14%).

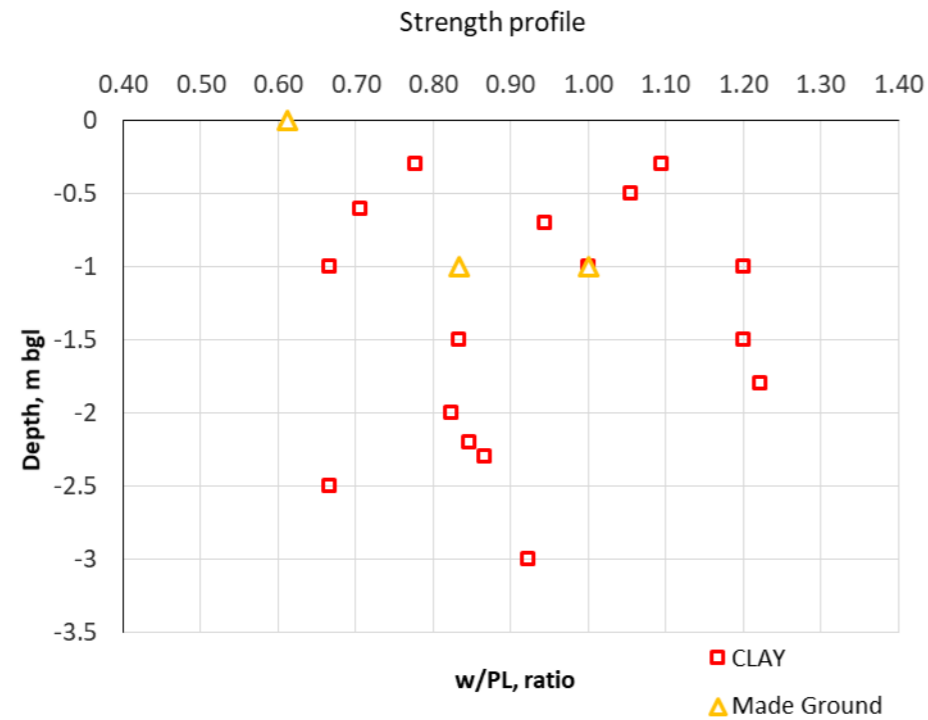
Summary of plasticity data



Moisture content profile



A review of the moisture content,  $w$  data indicated natural moisture content,  $w$  to plastic limit, PL ratio;  $w/PL$  ranged from 0.67 to 1.22. This was indicative of soft ( $w/PL > 1.2$ ) to stiff deposits (C504 Engineering in glacial tills, figure 5.19). The deposits were typically firm ( $w/PL 1.0 - 1.2$ ) to stiff ( $w/PL < 1.0$ ) with undrained shear strength of the order 40kPa to 150kPa are expected. Based on moisture content data the Made ground was described as firm,  $w/P < 1.0 - 1.2$ .



The  $N_{100H}$  data was correlated to *in situ* equivalent standard penetration tests,  $N_{SPT}$  such that:

$$N_{SPT} = N_{100H} + 3; N_{100H} < 4;$$

$$N_{SPT} = N_{100H} \times 2; N_{100H} > 4.$$

Taking a characteristic value of  $N_{SPT} = 4$ , a factor  $f_1 = 5.0$ ;  $f_1$  being function of  $PI = 11 - 16$ ; such that undrained shear strength:

$$C_u \text{ (kPa)} = N_{spt} \times f_1 \text{ (Stroud, 1975);}$$

an undrained shear strength of the order 20kPa is expected for the upper Made Ground, describing soft and 'soft to firm' CLAY/ SILT.

The *in situ* test data identified soft deposits to depth typically 2.0m bgl but up to 3.0m bgl (DP21/ DP25) at locations; DP16, DP17, DP18, DP19, DP21, DP23, DP24, DP25, DP26, DP27, DP28 and DP30.

Tactile assessment of soil strength indicated soft deposits at locations: TP04, TP07, TP17, TP18, TP20, TP21, TP23, TP24 and TP26 to depths 1.9m bgl to 3.8m bgl.

Plasticity data,  $PI (Ip) = 11 - 16$  suggested an angle of friction,  $\phi$  of  $31^\circ$  to  $32^\circ$  (C504) for the CLAY deposits.

$$\phi^\circ = 43 - 10 \times \log_{10}(Ip) \text{ (Ladd et al, 1977)}$$

Uncorrected, standard penetration tests within the slightly silty sandy GRAVEL deposits below 4.0m bgl yielded uncorrected values  $N_{SPT}$  15 to 36 indicating medium dense to dense deposits.

An angle of shearing resistance, friction  $\phi = 25^\circ$  for the loose very clayey very sandy GRAVEL. Angle of shearing resistance, friction  $\phi = 28^\circ$  to  $35^\circ$  is provided for the medium dense to dense GRAVEL .

$$\phi = (12N)^{0.5} + 15$$

Elastic modulus,  $E$  is assessed such that;

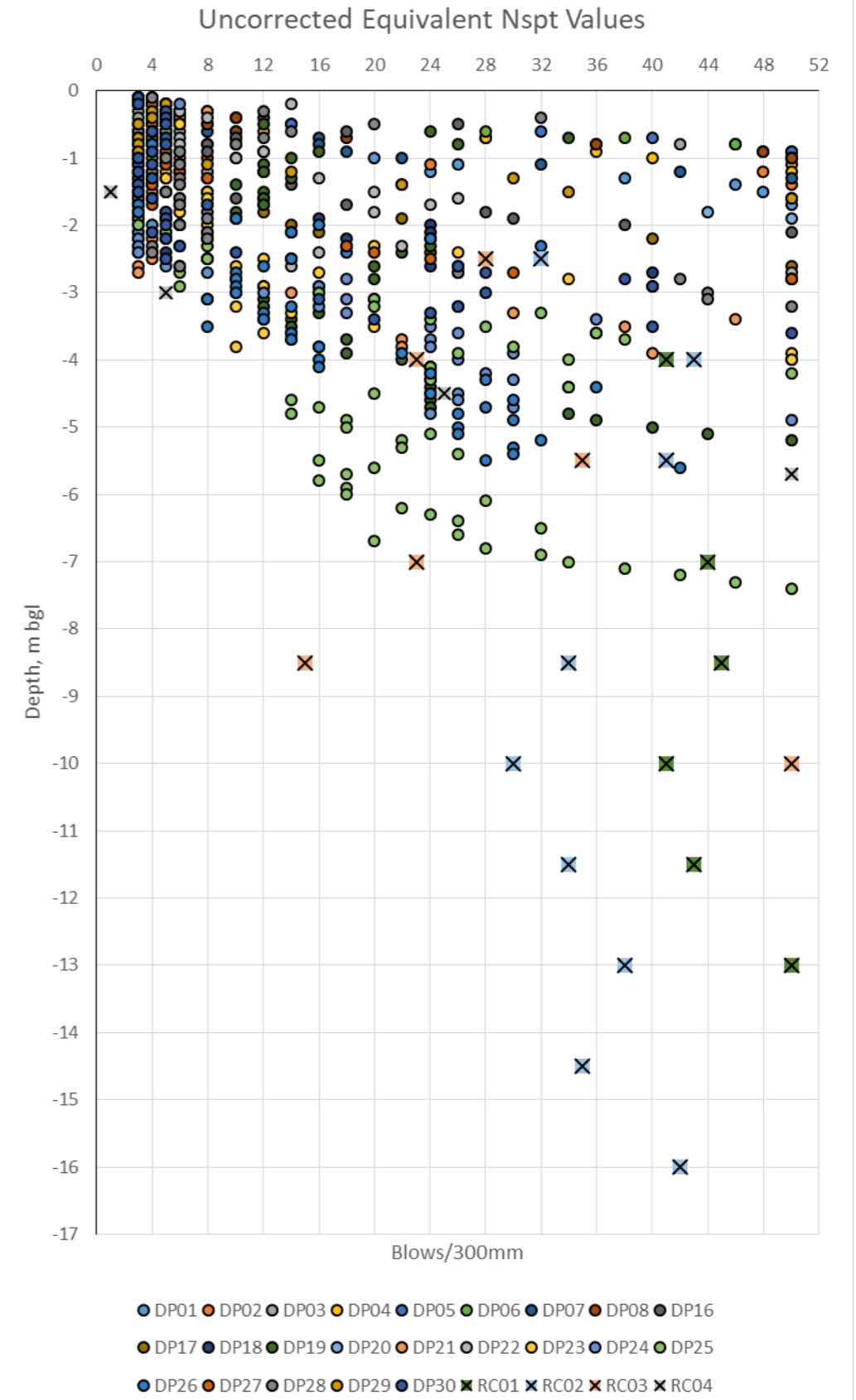
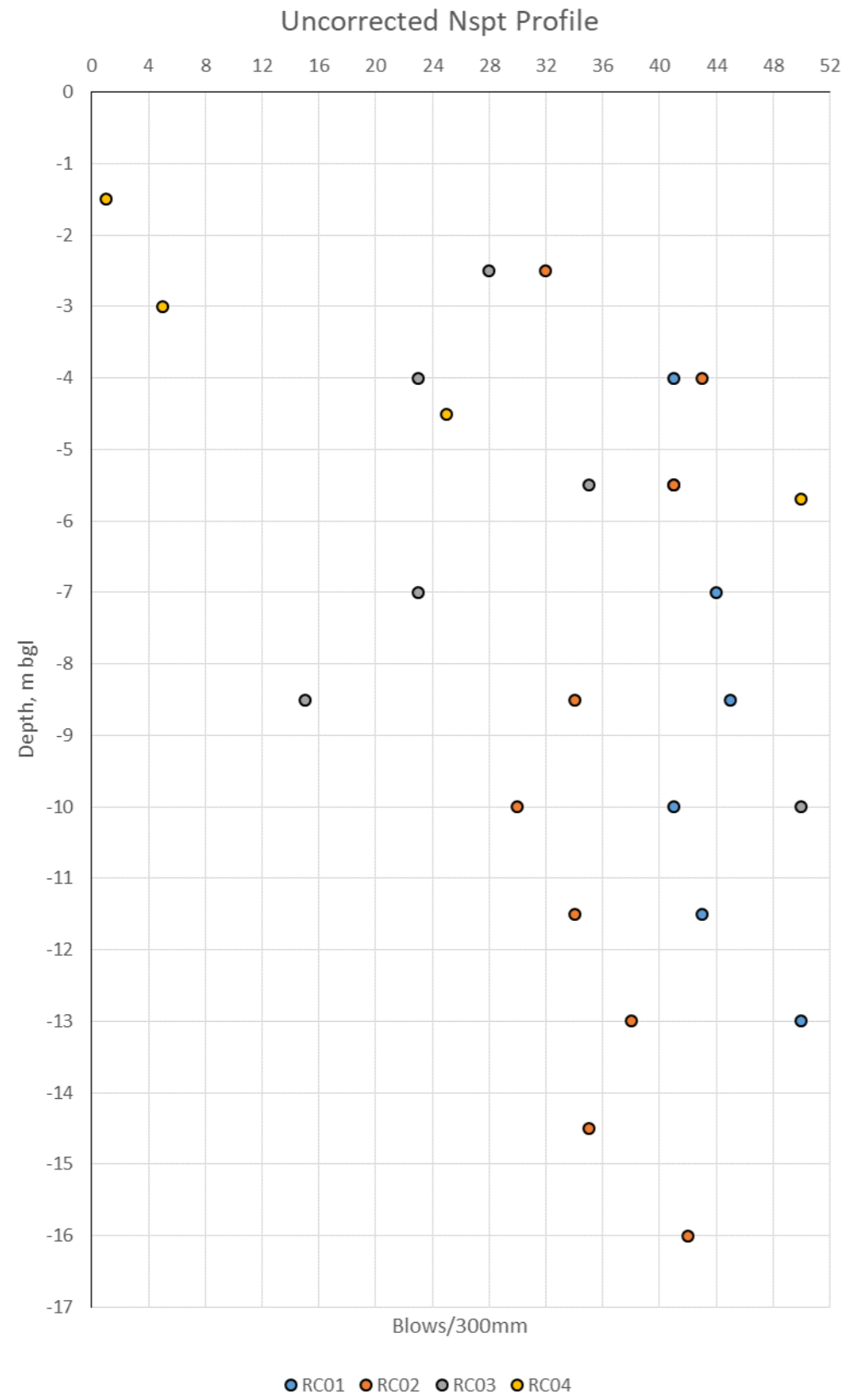
$$E \text{ (MPa)} = N_{SPT}; \text{ for the SAND deposits and}$$

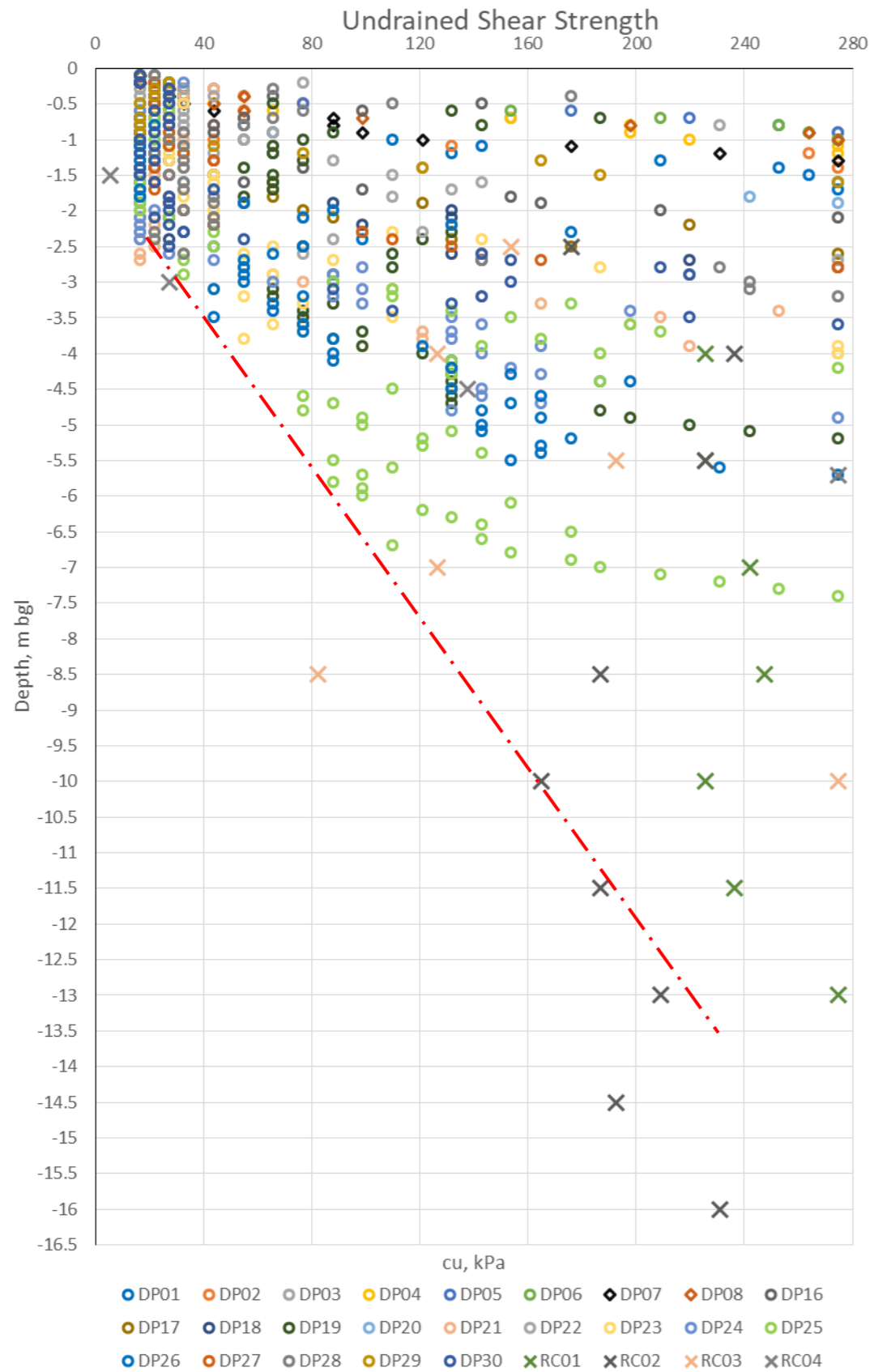
$$E \text{ (kPa)} = C_u \text{ (kPa)} \times 600; \text{ for the low plasticity (CL) deposits (Stroud, 1997).}$$

Soil Unit Weight(s) were assessed as follows:

$$\text{Granular: } \gamma_{sat} = 16.0 + 0.1N \text{ (kN/m}^3\text{)}$$

$$\text{Cohesive: } \gamma_{sat} = 16.8 + 0.15N_{60} \text{ (kN/m}^3\text{)}$$





### Shallow Foundations

Due to the variable nature of Made ground deposits, it is not recommended to found within the Made Ground deposits present to depths 0.5m bgl to 4.2m bgl; without some form of ground improvement.

Rolling dynamic compaction (RDC) can be expected to increase relative density and stiffness and thus increase bearing capacity and provide for a more uniform deposit.. The large plan area of the site is compatible with rolling dynamic compaction as a ground treatment. A programme of RDC will improve bearing for both the foundations and the proposed road network. This compaction technique can be expected to be effective over a large area in granular deposits to depths up to 2m -3m. Quality control before and after compaction would be necessary to establish sufficient increase in stiffness has been achieved. Multi -channel analysis of surface waves MASW is recommended to efficiently cover large areas. Provisionally a target allowable bearing capacity of 75kPa to 100kPa can be expected to be achieved after the RDC.

The medium dense becoming dense GRAVEL deposits and firm becoming stiff slightly sandy gravelly CLAY deposits have been identified as a suitable bearing strata. Shallow foundations are assessed.

Foundation dimension, B; 0.9m are considered at depths, D; typically 1.0m bgl. A characteristic shear strength of 100kPa is recommended at the proposed underside of foundation in SILT deposits. Taking a partial factor of safety, 1.4 and a bearing capacity factor  $N_c = 5.14$ , yielded an ultimate bearing capacity of 367kPa firm to stiff CLAY deposits (Skempton, 1951).

Foundation dimensions, B; 0.9m are considered at depths, D; typically 1.0m bgl. A characteristic (median) friction of  $30^\circ$  is recommended at the proposed underside of foundation in GRAVEL deposits. Taking a partial factor of safety, 1.25 a bearing capacity factor  $N_c = 19.3$ ,  $N_\gamma 6.89$  and  $N_q 9.6$ , yields an ultimate bearing capacity of 660kPa in the medium dense GRAVEL deposits (Terzaghi, 1947). Where groundwater remains below a depth 2.0m bgl the ultimate bearing capacity is reduced to 300kPa.

A presumed bearing pressure of 100kN/m<sup>2</sup> (kPa) to 300kPa is expected of medium dense to dense GRAVEL deposits where encountered (BS8004 Code of practice for foundations, 1986) noting 'Remark's relating to groundwater. A presumed bearing pressure of 75kN/m<sup>2</sup> (kPa) to 150kPa is expected of firm CLAY deposits where encountered (BS8004, 1986).

**Table 1 — Presumed allowable bearing values under static loading**

NOTE: These values are for preliminary design purposes only, and may need alteration upwards or downwards. No addition has been made for the depth of embedment of the foundation (see 2.1.2.3.2 and 2.1.2.3.3).

Category	Types of rocks and soils	Presumed allowable bearing value		Remarks
		kN/m <sup>2</sup> *	kg/cm <sup>2</sup> * ton/ft <sup>2</sup>	
Rocks	Strong igneous and gneissic rocks in sound condition	10 000	100	These values are based on the assumption that the foundations are taken down to unweathered rock. For weak, weathered and broken rock.
	Strong limestones and strong sandstones	4 000	40	
	Schists and slates	3 000	30	
	Strong shales, strong mudstones and strong siltstones	2 000	20	
Non-cohesive soils	Dense gravel, or dense sand and gravel	> 600	> 6	Width of foundation not less than 1 m. Groundwater level assumed to be a depth not less than below the base of the foundation. For effect of relative density and groundwater level.
	Medium dense gravel, or medium dense sand and gravel	< 200 to 600	< 2 to 6	
	Loose gravel, or loose sand and gravel	< 200	< 2	
	Compact sand	> 300	> 3	
	Medium dense sand	100 to 300	1 to 3	
	Loose sand	< 100	< 1	
Cohesive soils	Very stiff boulder clays and hard clays	300 to 600	3 to 6	Group 3 is susceptible to long-term consolidation settlement (see 2.1.2.3.3). For consistencies of clays, see Table 5
	Stiff clays	150 to 300	1.5 to 3	
	Firm clays	75 to 150	0.75 to 1.5	
	Soft clays and silts	<75	<0.75	
	Very soft clays and silts	Not applicable		
Peat and organic soils	Not applicable			
Made ground or fill	Not applicable			

\* 107.25 kN/m<sup>2</sup> = 1.094 kg/cm<sup>2</sup> = 1 ton/ft<sup>2</sup>.

A characteristic N<sub>SPT</sub> = 10 - 20 is recommended indicative of an allowable bearing capacity 100kPa for the medium dense mixed glacial deposits where;

$$q_{all} \text{ (kPa)} = N_{SPT} \times 10;$$

for a maximum settlement up to 25mm (Terzaghi and Peck, 1967).

The plate load test data, yielded ultimate bearing capacities, 247kPa to 850kPa with induced settlement up to 7.5mm to 34.0mm under loads up to 309kPa. The subsequent analysis was based on the proposed foundation dimensions, b<sub>strip</sub> 0.9m b<sub>strip</sub> /b<sub>450</sub> ratio 2.0; for structural loading up to 100kNm<sup>-2</sup> (kPa). The expected depth of influence, z<sub>a</sub> of the foundations is not expected to exceed a depth 1.5m below the underside of the

foundation; <3.0m bgl (Burland and Burbidge, 1985). For the purpose of the settlement analysis the ground was be considered homogenous within this depth. In accordance with Figure K.3, this yielded s<sub>strip</sub> /s<sub>600</sub> (s/s<sub>1</sub>) settlement ratio 2.0.

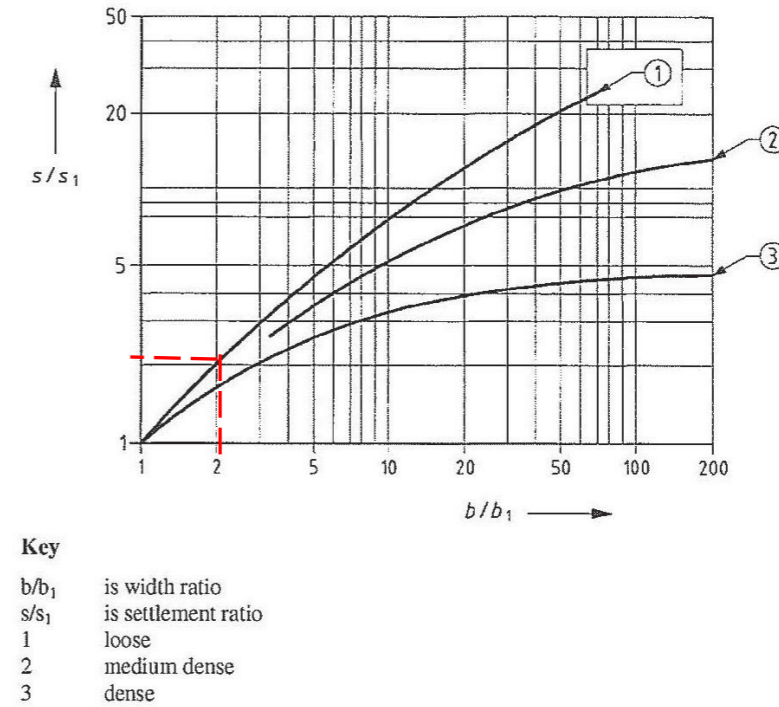


Figure K.3 — Graph for calculations of settlement based on plate loading tests

Plate (450mm dia.) settlements of 1.5mm to 5.5mm were induced under the imposed loading 100kPa at the locations and depths tested. The foundation shape, has been considered, assessing the L/B ratio, yielding a shape adjustment factor of 1.5. A further adjustment for long term settlement of 1.5 has been applied.

**Summary of PLT data and predicted, adjusted settlements**

Location	Test depth, m bgl (mOD Malin)	Δh 450 , mm at 100kPa loading	Δh strip 900, mm at 100kPa loading
PLT 01	0.5 (16.592)	1.5	7.0
PLT 02	1.5 (18.674)	3.5	16.0
PLT 03	1.5 (18.845)	5.5	25.0
PLT 04	0.5 (17.880)	4.0	18.0

Location	Refusal depth, m bgl	Depth to N <sub>100H</sub> >5 (D, m)		Strata description	Groundwater, m bgl <sup>2</sup>	Q <sub>ult</sub> / Q <sub>all</sub> , kPa <sup>3</sup>	Adjusted <sup>4</sup> settlement, ΔH, mm (B = 0.9m)
		m bgl	mOD, Malin				
DP01	1.7	0.9	20.19	Clayey very sandy GRAVEL	3.4	254/ 100	4
DP02	1.4	1.1	20.53	Clayey very sandy GRAVEL	3.7	319/ 100	4
DP03	0.9	1.5	19.11	Slightly sandy gravelly CLAY	2.4	237/ 100	3
DP04	1.2	1.0	19.21	Slightly gravelly sandy CLAY	2.8	308/ 100	11
DP05	1.0	0.8	19.19	-	-	359/ 100	9
DP06	1.0	0.8	18.11	Clayey sandy GRAVEL	2.7	250/ 100	3
DP07	1.3	0.8	17.00	Slightly sandy clayey GRAVEL	1.6	128/ 75	6
DP08	1.0	0.8	15.19	-	-	154/ 100	6
DP16	2.0	1.8	18.57	MADE GROUND, slightly gravelly sandy SILT	-	259/ 100	7
DP17	2.6	1.6	15.37	Slightly sandy slightly gravelly CLAY	1.3	155/ 75	6
DP18	2.8	2.0	16.58	Slightly sandy slightly gravelly CLAY	3.1	435/ 100	7
DP19	5.1	0.8	18.34	Slightly sandy slightly gravelly CLAY	1.0	70/ 65	6
DP20	1.8	1.8	16.10	Slightly sandy slightly gravelly CLAY	1.0	70/ 65	6
DP21	3.9	3.0	15.25	-	-	261/ 100	5
DP22	2.7	1.5	19.61	Clayey sandy GRAVEL	-	197/ 100	8
DP23	3.9	2.4	17.15	Soft slightly sandy gravelly CLAY	-	154/ 100	11
DP24	2.8	2.8	19.35	Slightly sandy slightly gravelly CLAY	-	407/ 100	4
DP25	7.3	3.0	18.17	Firm, brown, slightly sandy gravelly CLAY	-	283/ 100	4
DP26	5.7	2.0	18.05	Slightly sandy gravelly CLAY	3.6	174/ 100	9
DP27	2.8	2.4	17.09	Slightly sandy gravelly CLAY	2.4	160/ 100	4
DP28	3.1	2.8	14.86	Slightly sandy slightly gravelly CLAY	1.0	142/ 100	4
DP29	1.6	1.2	19.54	-	-	367/ 100	4
DP30	3.5	2.7	15.24	-	-	215/ 100	4

<sup>2</sup> Where groundwater has been identified ultimate bearing pressures have been adjusted for saturated unit weight.

<sup>3</sup> A partial factor of safety 1.25 has been applied to GRAVEL deposits ( $\phi = (N_{SPT} + 12)^{0.5} + 15$ ) and 1.4 to CLAY deposits.

<sup>4</sup> Predicted settlement have been adjusted for the foundation geometry, B/L ratio and long term settlement.

Allowable bearing pressures of 65kPa to 100kPa are recommended for shallow foundations for predicted settlement not exceeding 25mm.

Where foundations lie below a depth 1.5m bgl the foundations shall be over excavated to the recommended depth and backfilled with lean mix concrete to a depth 1.2m bgl.

Raft foundations may be considered in the vicinity of shallow ground water for the lower bound of bearing capacity 65kPa to minimise excavations below the groundwater table. See previous also in relation to ground improvement.

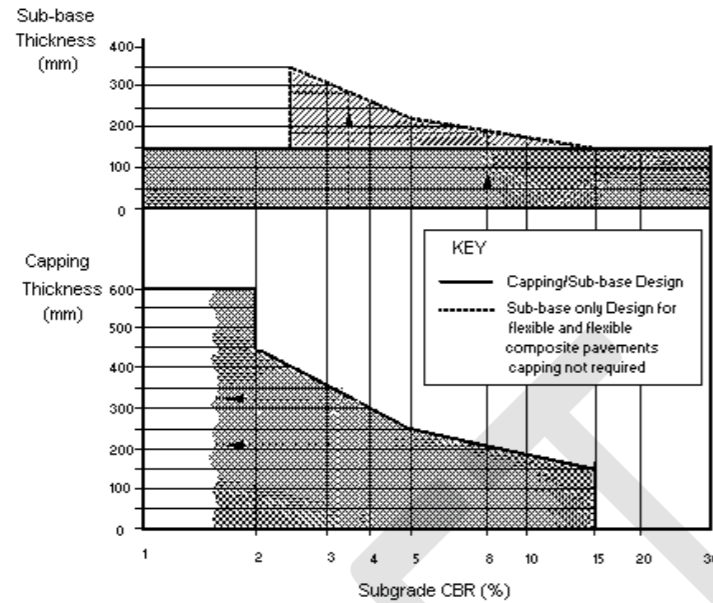
#### Hard standing

CBR values obtained by dynamic probing ranged between CBR1.5% to CBR3.0% in the upper layers to a depth 1.0m bgl. Plate loading test data yielded CBR3% to CBR13%. Plasticity data (PI 14 – 19) suggested a CBR1% to CBR4%.

Location	Depth, m bgl	CBR % (below depth, 0.5m bgl)	Sub-base (mm)	Capping (mm)
PLT01	0.5	13	150	-
PLT02	1.5	3.5	150	300
PLT03	1.5	2.9	150	350
PLT04	0.5	4.7	150	250

Capping 250mm to 350mm thick and a sub-base thickness of 150mm is recommended for hard standing and pavement construction in accordance with Tii DMRB Vol 7 Pt 2A, TD25-26/1- Figure 4.1 for a proposed design CBR3% to CBR5%.

Drainage shall be provided a minimum of 600m below the underside of capping, sub-formation level. It can be expected to require an increased capping thickness up to an additional 200mm to provide a finish road level at existing ground level.



### Excavations

Excavation in the superficial deposits shall be by means of hydraulic excavator. While it is not expected to encounter bedrock, rock was identified at 5.7m bgl in RC04. Trial pit excavation stability was described as variable good to poor.

Location	Excavated depth, m bgl	Stability Remarks	Groundwater Remarks
SK01	1.3	Moderate	None encountered
SK02	1.5	Moderate	None encountered
TP01	4.0	Moderate	3.40m: Trickle flow rate.
TP02	4.0	Moderate	3.70m: Steady rate of flow.
TP03	3.7	Poor	2.40m: Steady rate of flow
TP04	3.6	Moderate	2.80m: Trickle flow rate.
TP05	3.8	Poor	2.70m: Steady rate of flow
TP06	2.6	Poor	1.60m: Steady flow rate.
TP07	3.8	Poor	1.00m: Slow flow rate.
TP08	4.0	Moderate	0.60m: Slow flow rate.
TP09	4.1	Moderate	None encountered.
TP10	4.2	Moderate	None encountered.
TP11	2.2	Poor	None encountered.
TP12	4.1	Moderate	None encountered.
TP14	3.1	Moderate	2.00m: Fast rate of flow.
TP15	4.1	Good	None encountered.
TP16	4.2	Good	None encountered.
TP17	3.4	Moderate	1.3m/ 2.70m: Steady flow rates.
TP18	3.2	Moderate	3.10m: Fast flow rate.

Location	Excavated depth, m bgl	Stability Remarks	Groundwater Remarks
TP20	3.7	Very poor	None encountered.
TP21	3.8	Poor	None encountered.
TP22	2.0	Moderate	None encountered.
TP23	3.2	Poor	None encountered
TP24	3.5	Poor	None encountered
TP26	4.3	Good	None encountered
TP27	3.6	Poor	2.40m: Slow flow rate.
TP28	4.0	Poor	3.60m: Slow flow rate.

### Groundwater

Groundwater was encountered in the exploratory locations at depths 0.6m bgl and 3.7m bgl. Seasonal variations may occur.

*It is recommended to install 19mm dia. standpipe wells using dynamic probes equipment to allow for the monitoring of groundwater to assess possible seasonal variation in groundwater levels where groundwater was identified as a particular risk.*

Infiltration as a means of surface water control may be given full consideration where an infiltration coefficient (permeability) of magnitude  $10^{-5} \text{ ms}^{-1}$  or greater exists. Infiltration coefficients of  $9.1 \times 10^{-6} \text{ ms}^{-1}$  and  $9.6 \times 10^{-6} \text{ ms}^{-1}$  were measured.

Location	Depth, m bgl	Strata at base of excavation	Infiltration rate, $\text{m s}^{-1}$
SK01	1.25	Very clayey very sandy GRAVEL	9.6 E-06
SK02	1.50	Slightly sandy gravelly CLAY	9.1 E-06

With particle size  $d_{10} = 0.15\text{mm}$  to  $0.009\text{mm}$  in the clayey GRAVEL deposits a permeabilities of  $2.2 \times 10^{-4} \text{ ms}^{-1}$  to  $8.1 \times 10^{-7} \text{ ms}^{-1}$  are expected. This describes low permeability Gravel. With  $d_{10} = 0.003$  to  $0.001\text{mm}$  in the SILT, a permeability of the order  $9 \times 10^{-8} \text{ ms}^{-1}$  are expected. This describes low permeability Clay.

The use of soakaways is considered impractical within the CLAY and very clayey GRAVEL deposits encountered within the site. Soakaways may be considered in the coarser Gravel deposits. Such areas are expected to be limited within the site.


## Chemical

Based on the pH (7.1 to 8.5) and sulphate (<0.010g/l/ <0.010% to 0.020g/l/ 0.037%) data indicate design sulphate class DS-1 in accordance with BRE Digest for concrete in aggressive ground for static groundwater conditions. There are no special requirements with regard to concrete mix design.

Location	TP02	TP03	TP05	TP07	TP08	TP10	TP17	TP22	SK01	SK02
Depth, m bgl	1.0	0.3	1.3	1.0	1.0	1.0	1.5	1.4	0.6	0.0
Moisture content, %	8.4	14	9.4	12	18	15	12	14	9.0	11
pH	7.9	7.6	8.4	8.1	7.1	8.2	8.5	8.4	7.4	8.3
Sulphate (2:1 Water Soluble) as SO <sub>4</sub> g/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.010	< 0.01	< 0.01	< 0.01	0.020
Total Sulphur, %	< 0.01	0.012	< 0.01	< 0.01	0.017	0.030	< 0.01	0.012	< 0.01	0.021
Sulphate (Acid Soluble), %	< 0.01	0.012	< 0.01	< 0.01	0.037	0.020	< 0.01	0.028	< 0.01	0.016
Organic Matter, %	< 0.40	< 0.40	< 0.40	< 0.4	0.76	1.2	< 0.4	0.52	< 0.4	0.48

Should you have any queries in relation to the data collected and presented, or the subsequent analysis; please do not hesitate to contact our office.

Yours sincerely,  
For **Priority Geotechnical**,



**James McSweeney**  
BSc Engineering Geologist

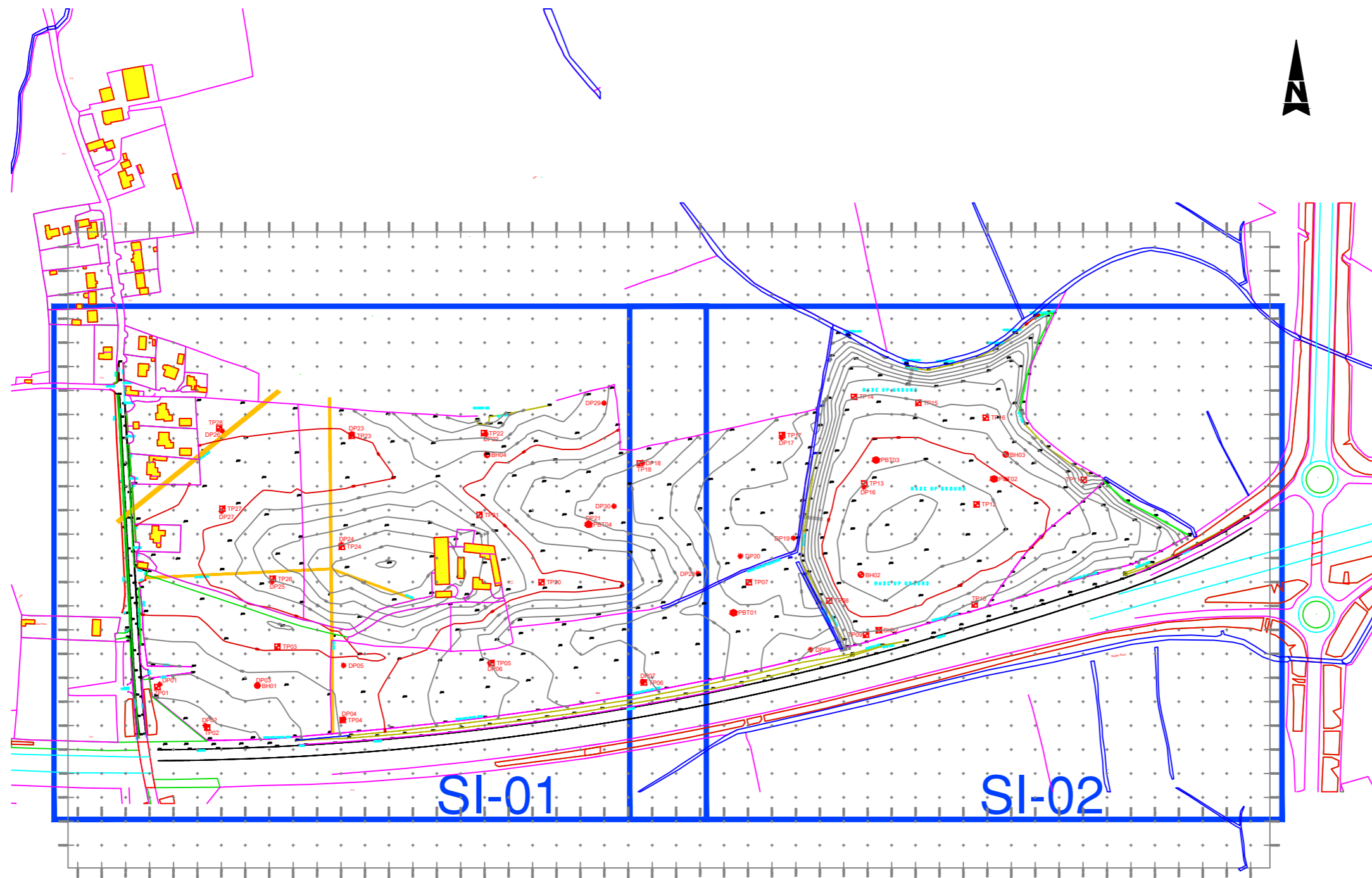


**Greg Hayes BE MEngSc CEng MIEI**  
Geotechnical Specialist

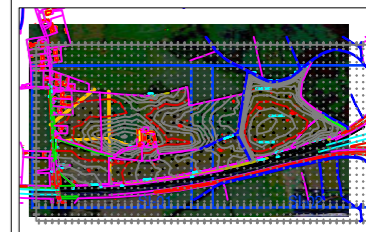
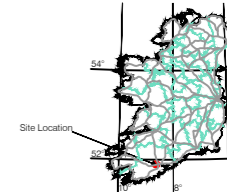
*No responsibility or liability can be held by PGL for ground conditions between or extraneous to exploratory locations. The exploratory logs provide for ground profiles and configuration of strata relevant to the investigation depths achieved during the fieldworks. Caution shall be taken when extrapolating between such exploratory locations.*

*The interpretation of the current data set may be subject to change where additional data becomes available.*

*This report has been prepared for the Client and their Representative as outline, herein. The information should not be used without their prior written permission. PGL accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.*



Priority Geotechnical Site



JOB NAME:

O' Flynn Site Ballincollig Cork.

Sheet Title:

EXPLORATORY LOCATION LAYOUT

JOB NUMBER:

P19223

DRAWING NUMBER:

P19223-SI-A

DRAWN BY:

Gary Curtin

DATE:

11/11/2019

SCALE:  
1:5000 ON A3

APPROVED:  
GH

REVISION:

D01





KEY:

	TP00	Denotes Trial Pit location
	BH00	Denotes Borehole location
	PBT00	Denotes Plate Bearing Test location
	SK00	Denotes Soakaway Test location
	DP00	Denotes Dynamic Probe location

JOB NAME:  
O'Flynn Site Ballincollig Cork.

Sheet Title:  
EXPLORATION LOCATION PLAN

JOB NUMBER:  
P19223

DRAWING NUMBER:  
P19223-SI-01

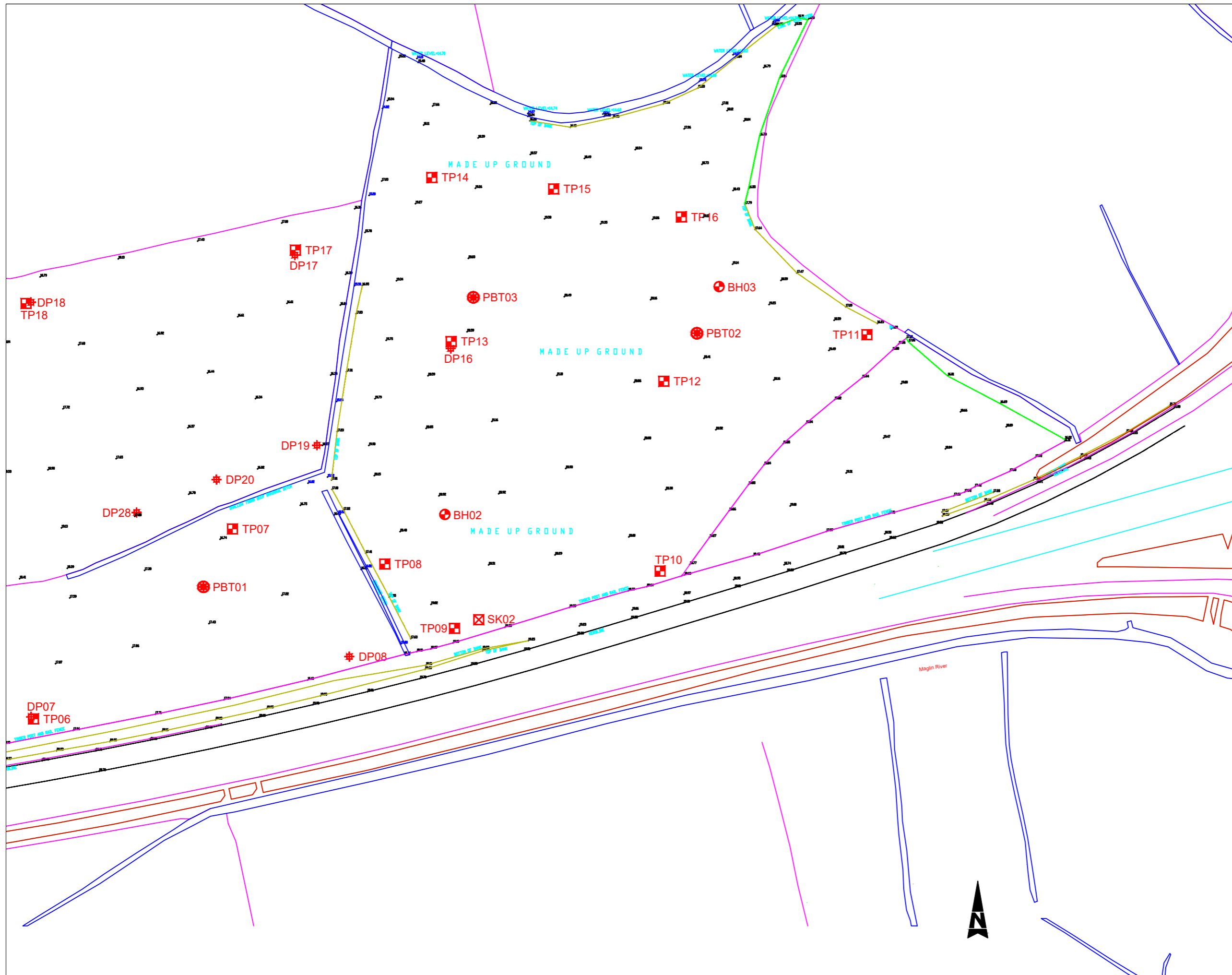
DRAWN BY:  
Gary Curtin

DATE:  
11/11/2019

SCALE: 1:2000 ON A3	APPROVED: GH
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REVISION:  
D01





KEY:

	TP00	Denotes Trial Pit location
	BH00	Denotes Borehole location
	PBT00	Denotes Plate Bearing Test location
	SK00	Denotes Soakaway Test location
	DP00	Denotes Dynamic Probe location

JOB NAME:  
O'Flynn Site Ballincollig Cork.

Sheet Title:  
EXPLORATION LOCATION PLAN

JOB NUMBER:  
P19223

DRAWING NUMBER:  
P19223-SI-02

DRAWN BY:  
Gary Curtin

DATE:  
11/11/2019

SCALE: 1:2000 ON A3	APPROVED: GH
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REVISION:  
D01



**APPENDIX 9-6 GSI Bedrock and Vulnerability Maps**

Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.6 – GSI Bedrock and Vulnerability Maps**

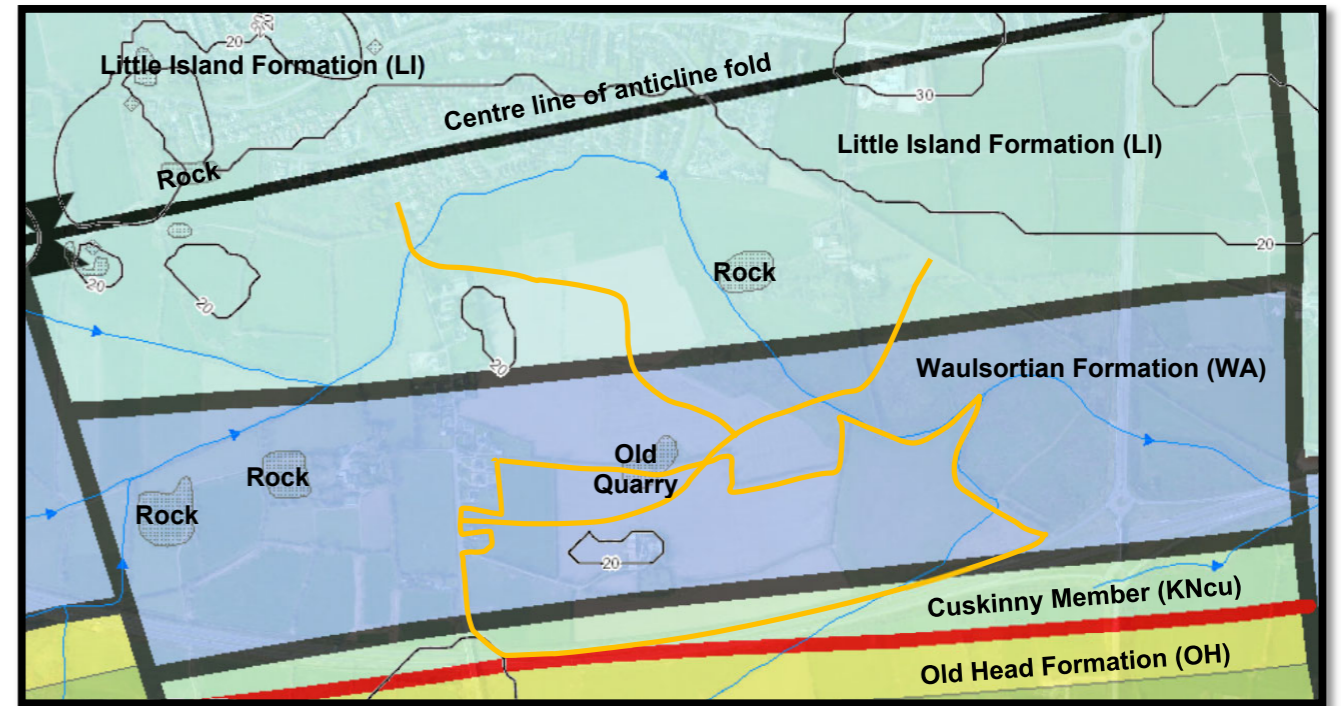


Image 9.6.1: GSI Bedrock Geology with Carboniferous WA & LI Limestone Formations over most of the site area and old Devonian Siltstone & Mustones of Cuskinny Member (KNcu) in southern area.

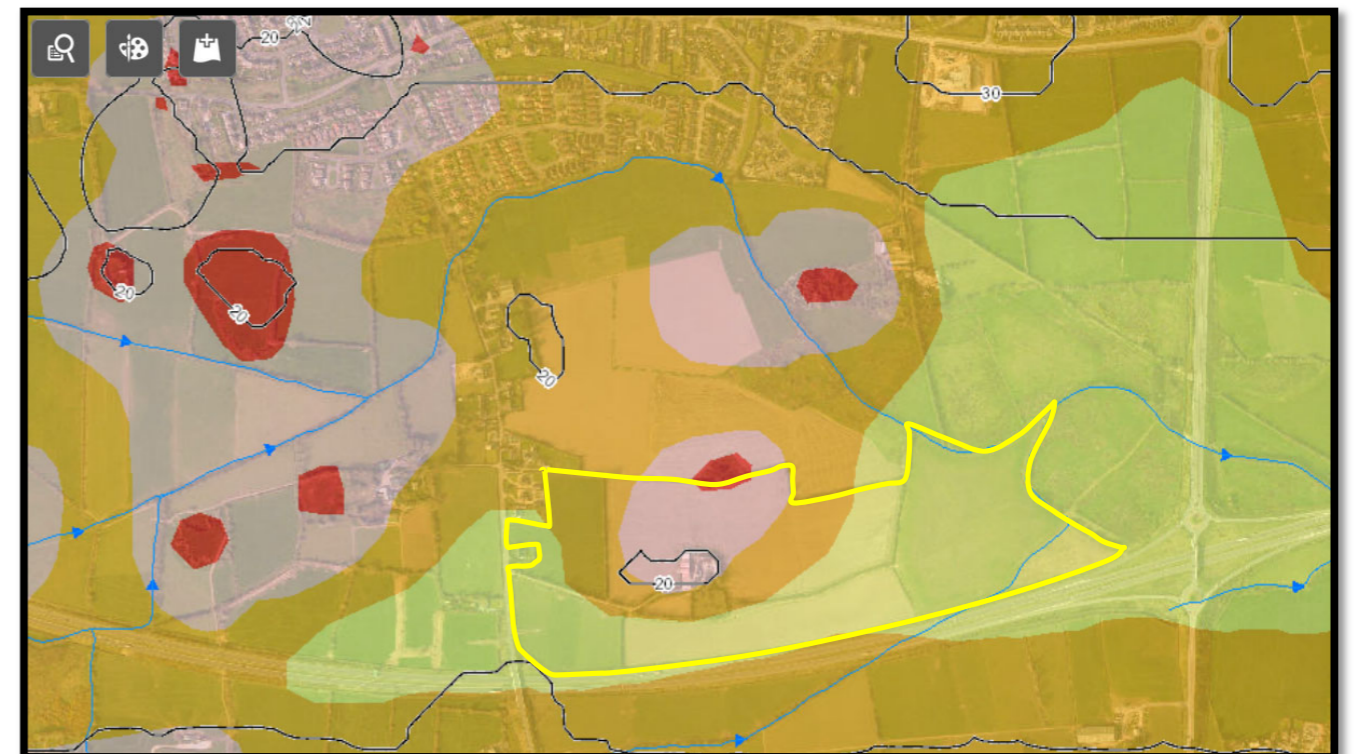


Image 9.6.2: Vulnerability Map. Extreme to Moderate Vulnerability with rock close in red & pink areas.

**APPENDIX 9-7 EPA Licensed Industrial Emissions Map**



Maglin LSD EIAR Chapter 9 Land and Soil (Geology)  
**Appendix 9.7 – EPA Licensed Industrial Emissions Map**



# CHAPTER TEN

## HYDROLOGY & HYDROGEOLOGY

- APPENDIX 10-1 Glasheen Catchment WFD Cycle 2 Report
- APPENDIX 10-2 EPA Catchment Mapping
- APPENDIX 10-3 EPA Hydrology Maps
- APPENDIX 10-4 GSI Mapping
- APPENDIX 10-5 MWP Flood Maps
- APPENDIX 10-6 EPA & GSI Groundwater Maps

**APPENDIX 10-1 Glasheen Catchment WFD Cycle 2 Report**

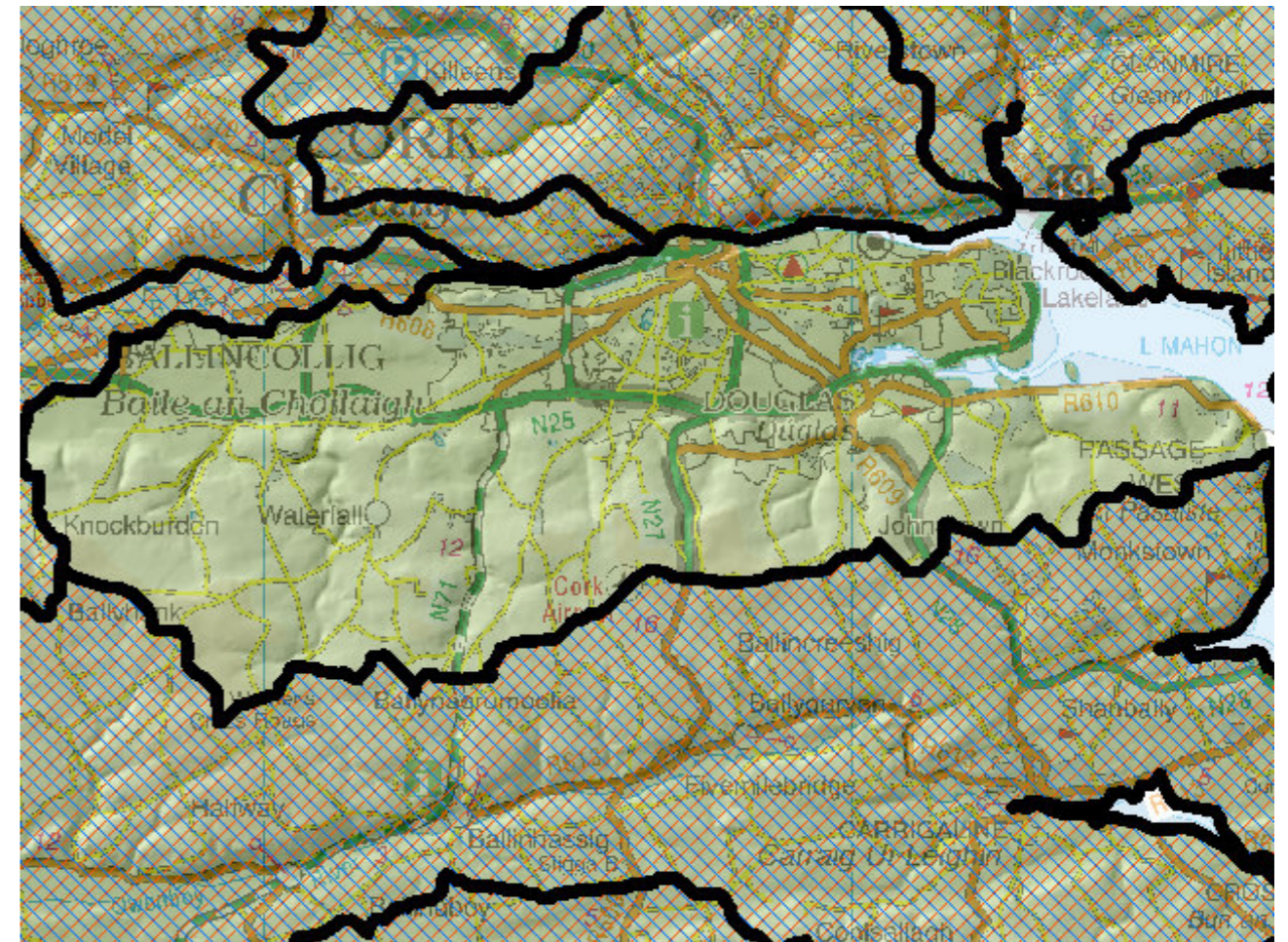
## WFD Cycle 2

Catchment Lee, Cork Harbour and Youghal Bay

Subcatchment Glasheen[Corkcity]\_SC\_010

Code 19\_17

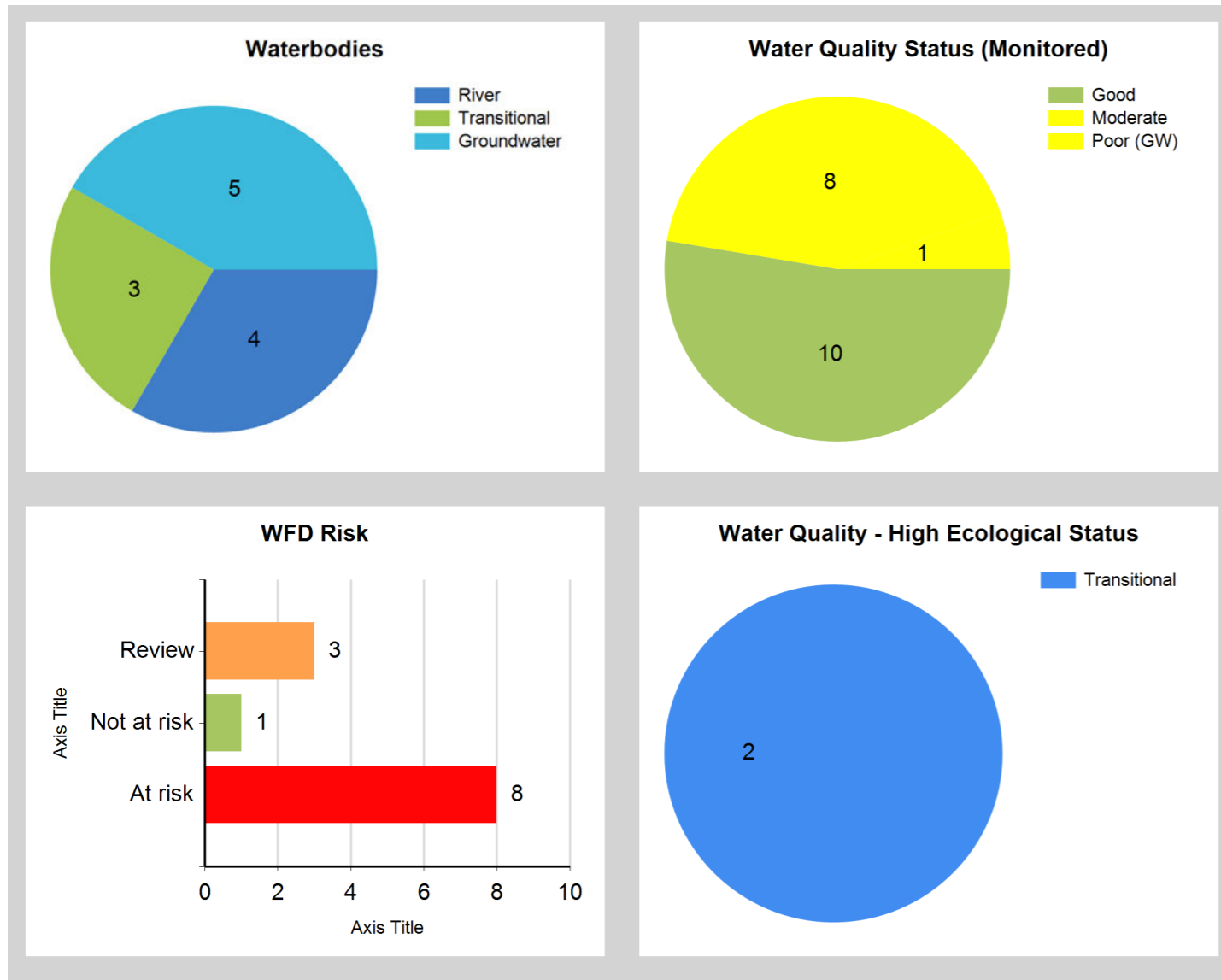
Maglin LSD EIAR Chapter 10 - Water  
**Appendix 10.1 – Glasheen Catchment WFD Cycle 2 Report**



### Assessment Purpose

This assessment has been produced as part of the national characterisation programme undertaken for the second cycle of Water Framework Directive river basin management planning. It has been led by the EPA, with input from Local Authorities and other public bodies, and with support from RPS consultants.

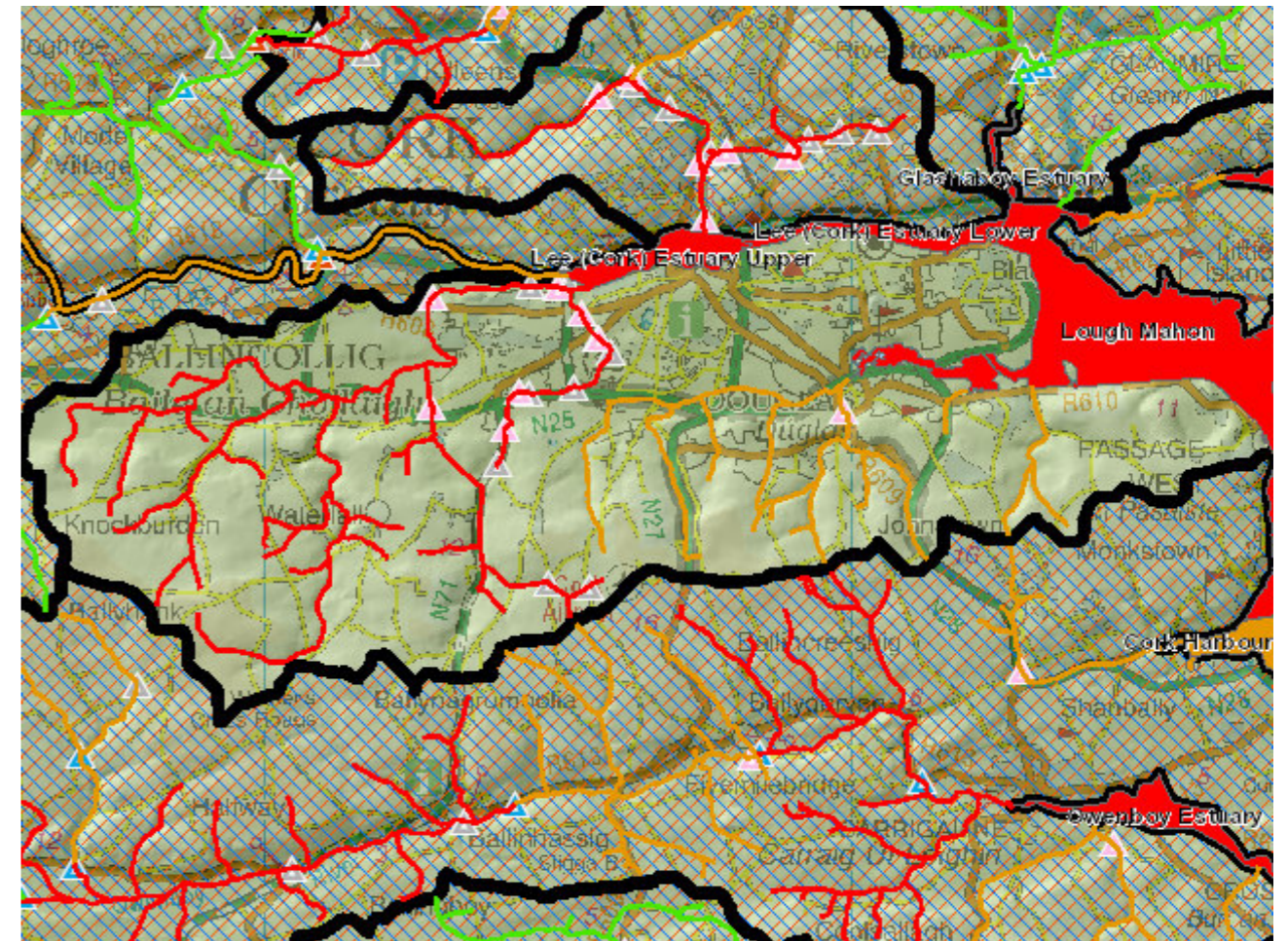
The characterisation assessments are automatically generated from the information stored in the WFD Application. They are based on information available to the end of 2015 but may be subject to change until the final 2018-21 river basin management plan is published. Users should ensure that they have the most up to date information by downloading the latest assessment before use.



### Evaluation of Priority Subcatchment Issues

All four water bodies in this subcatchment are unassigned but AT RISK due to elevated phosphate concentrations. Further investigation is required to determine what is impacting nutrient conditions.

### Map Subcatchment Risk Map

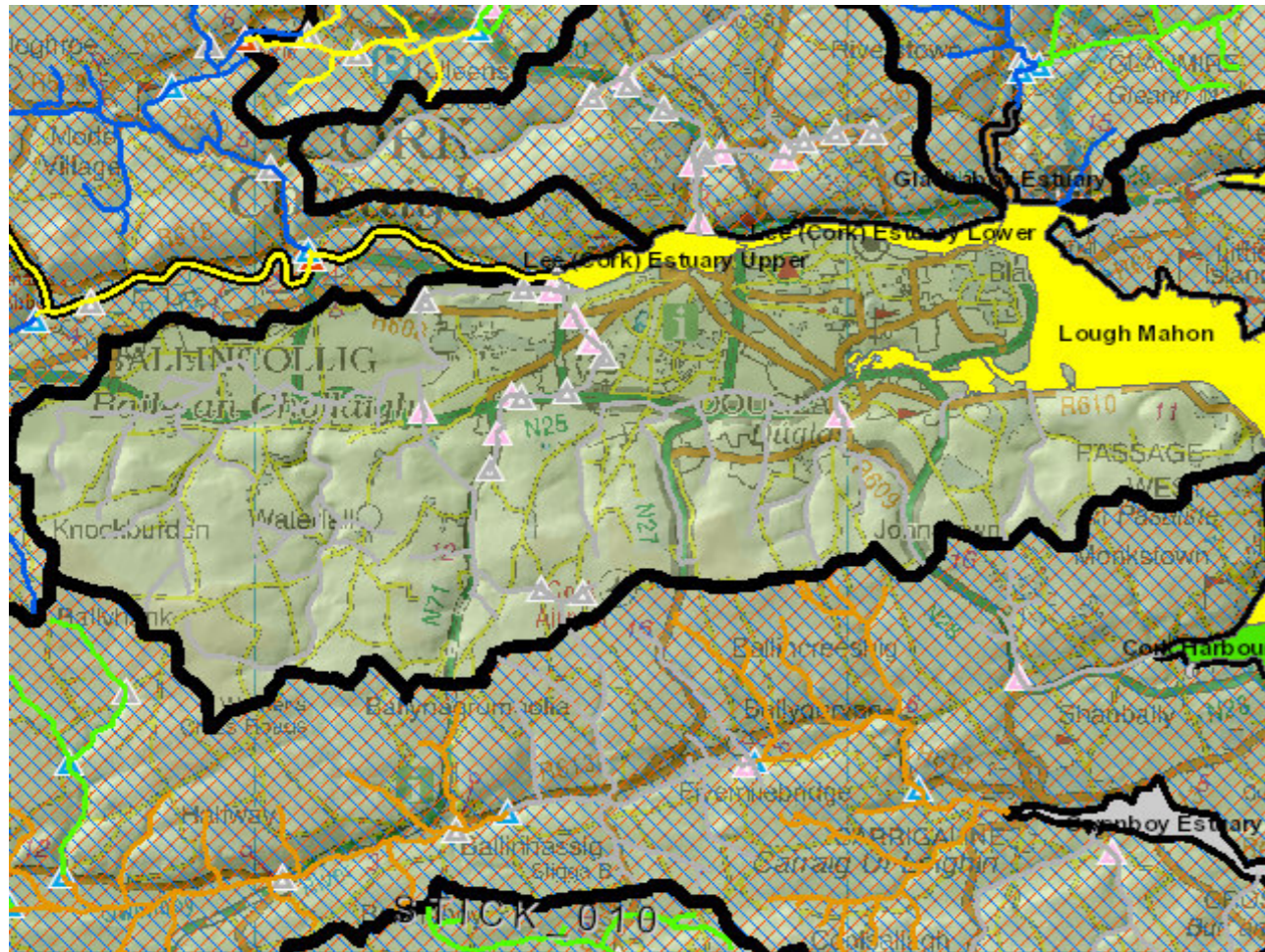


## River And Lake Waterbodies: WFD Risk

The following river and lake waterbodies are in the subcatchment.

Code	Name	Type	WFD Risk	Significant Pressure
IE_SW_19C120740	CURRAGHEEN (Cork City)_010	River	At risk	Yes
IE_SW_19G040700	GLASHEEN (Cork City)_010	River	At risk	Yes
IE_SW_19T050890	TWO POT (Cork City)_010	River	At risk	Yes
IE_SW_19M300900	MONEYGURNEY_010	River	Review	Yes

## Map Subcatchment Water Quality Status Map



## River And Lake Waterbodies: Water Quality Status

The water quality status of river and lake waterbodies in the subcatchment is as follows.

Code	Name	Type	2007-09	2010-12	2010-15
IE_SW_19C120740	CURRAGHEEN (Cork City)_010	River	Unassigned	Unassigned	Unassigned
IE_SW_19G040700	GLASHEEN (Cork City)_010	River	Unassigned	Unassigned	Unassigned
IE_SW_19M300900	MONEYGURNEY_010	River	Unassigned	Unassigned	Unassigned
IE_SW_19T050890	TWO POT (Cork City)_010	River	Unassigned	Unassigned	Unassigned

## Potentially Dependent Transitional and Coastal Waterbodies

The Transitional and Coastal waterbodies listed below intersect spatially with river and lake waterbodies in the subcatchment ...

Code	Name	Type	Local Authority	WFD Risk
IE_SW_060_0750	Lough Mahon	Transitional	Cork County Council	At risk
IE_SW_060_0900	Lee (Cork) Estuary Lower	Transitional	Cork City Council	At risk
IE_SW_060_0950	Lee (Cork) Estuary Upper	Transitional	Cork City Council	At risk

## Potentially Dependent Groundwater Waterbodies

The groundwaters listed below intersect spatially with river and lake waterbodies in the subcatchment ...

Code	Name	Type	Local Authority	WFD Risk
IE_SW_G_002	Ballincollig	Groundwater	Cork County Council	Review
IE_SW_G_004	Ballinhassig East	Groundwater	Cork County Council	Review
IE_SW_G_009	Waste Facility (W0023-01)	Groundwater	Cork County Council	Not at risk
IE_SW_G_091	Waste Facility (W0012-03)	Groundwater	Cork City Council	At risk
IE_SW_G_094	Lee Valley Gravels	Groundwater	Cork County Council	At risk

## Protected Areas intersecting River and Lake Waterbodies

The Protected Areas listed below intersect spatially with river and lake waterbodies in the subcatchment ...

Code	Name	Type	Waterbody Name	Association Type
IE0004030	Cork Harbour SPA	SPA	MONEYGURNEY_010	Overlapping / partly within Protected Area
IETW_SW_2004_0041	Lee Estuary / Lough Mahon	Nutrient Sensitive Area	MONEYGURNEY_010	Overlapping / partly within Protected Area

## Pressures

Below is a list of all significant pressures identified in the subcatchment.

Code	Name	WFD Risk	Pressure Category	Pressure Sub Category
IE_SW_060_0750	Lough Mahon	At risk	Urban Waste Water	Agglomeration PE > 10,000
IE_SW_060_0750	Lough Mahon	At risk	Urban Waste Water	Combined Sewer Overflows
IE_SW_060_0750	Lough Mahon	At risk	Urban Waste Water	Agglomeration PE of 2,001 to 10,000
IE_SW_060_0900	Lee (Cork) Estuary Lower	At risk	Urban Waste Water	Combined Sewer Overflows
IE_SW_060_0900	Lee (Cork) Estuary Lower	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_SW_060_0950	Lee (Cork) Estuary Upper	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_SW_060_0950	Lee (Cork) Estuary Upper	At risk	Urban Waste Water	Combined Sewer Overflows
IE_SW_19C120740	CURRAGHEEN (Cork City)_010	At risk	Anthropogenic Pressures	Unknown
IE_SW_19G040700	GLASHEEN (Cork City)_010	At risk	Anthropogenic Pressures	Unknown
IE_SW_19T050890	TWO POT (Cork City)_010	At risk	Anthropogenic Pressures	Unknown
IE_SW_G_091	Waste Facility (W0012-03)	At risk	Waste	Waste
IE_SW_G_094	Lee Valley Gravels	At risk	Domestic Waste Water	Waste Water discharge
IE_SW_19M300900	MONEYGURNEY_010	Review	Anthropogenic Pressures	Unknown
IE_SW_G_002	Ballincollog	Review	Anthropogenic Pressures	Unknown
IE_SW_G_004	Ballinhassig East	Review	Anthropogenic Pressures	Unknown

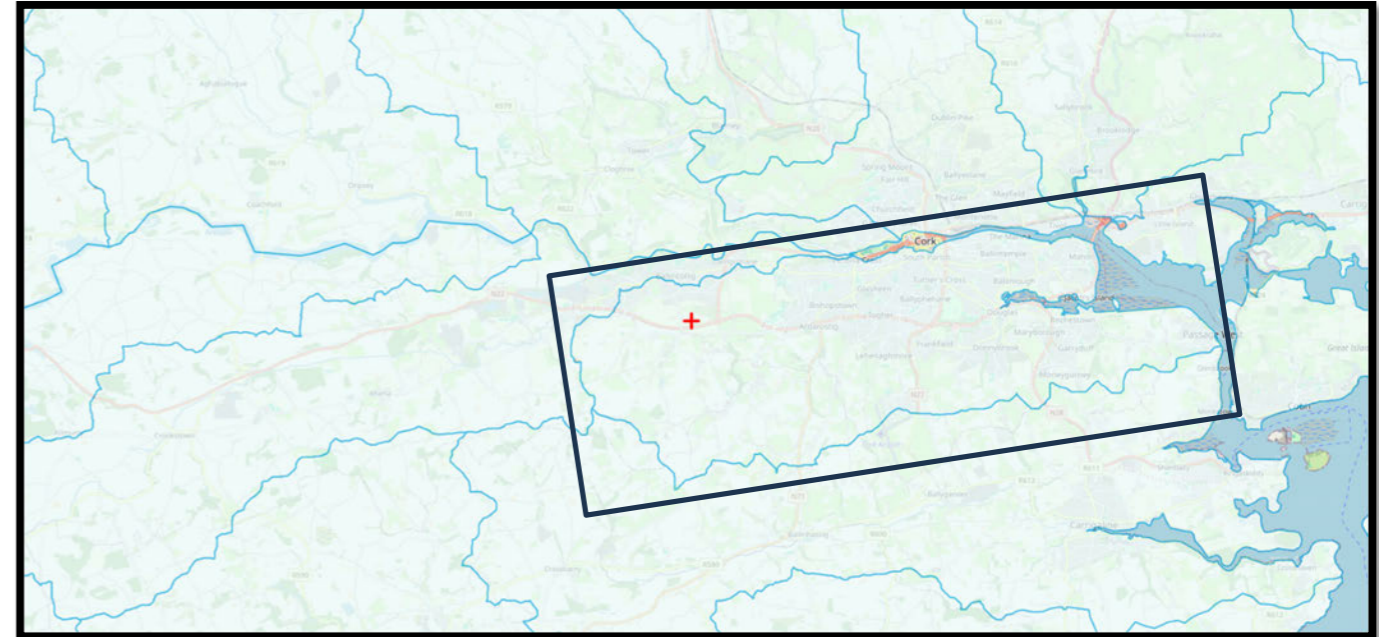
## Further Characterisation Actions

The following further characterisation actions have been identified. These are necessary to help understand more fully issues in the subcatchment and their likely cause.

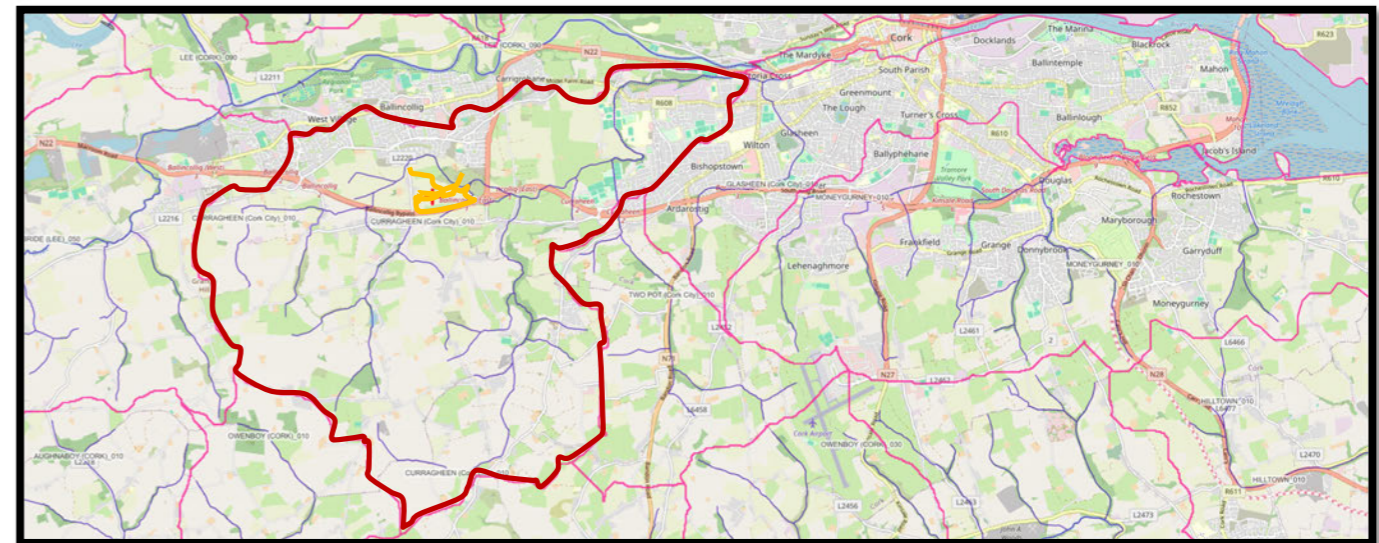
Code	Name	Action	Responsible Organisation
IE_SW_19G040700	GLASHEEN (Cork City)_010	IA6 Multiple Sources in Large Urban Area	Cork City Council
IE_SW_19M300900	MONEYGURNEY_010	IA3 Determination of Water Quality (unassigned waterbody)	Cork City Council
IE_SW_19C120740	CURRAGHEEN (Cork City)_010	IA6 Multiple Sources in Large Urban Area	Cork City Council
IE_SW_19T050890	TWO POT (Cork City)_010	IA7 Multiple Sources in Multiple Areas	Cork City Council

**APPENDIX 10-2 EPA Catchment Mappin**

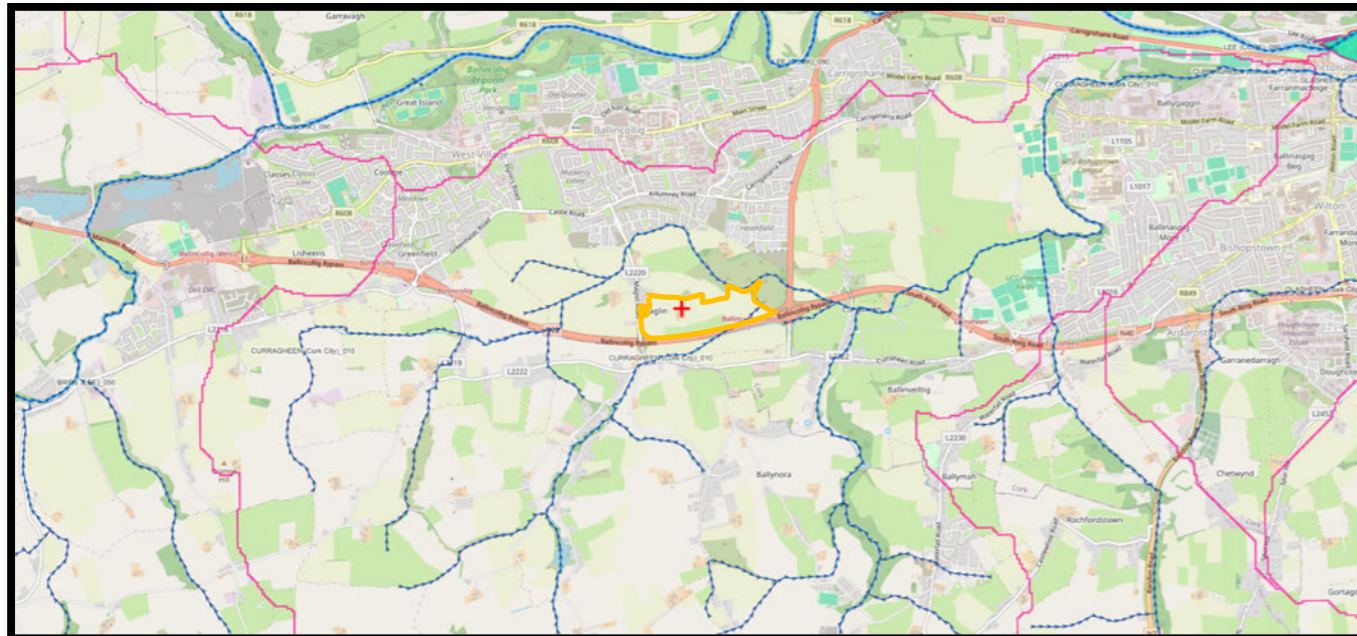
Maglin LSD EIAR Chapter 10 - Water  
**Appendix 10.2 – EPA Catchment Mapping**



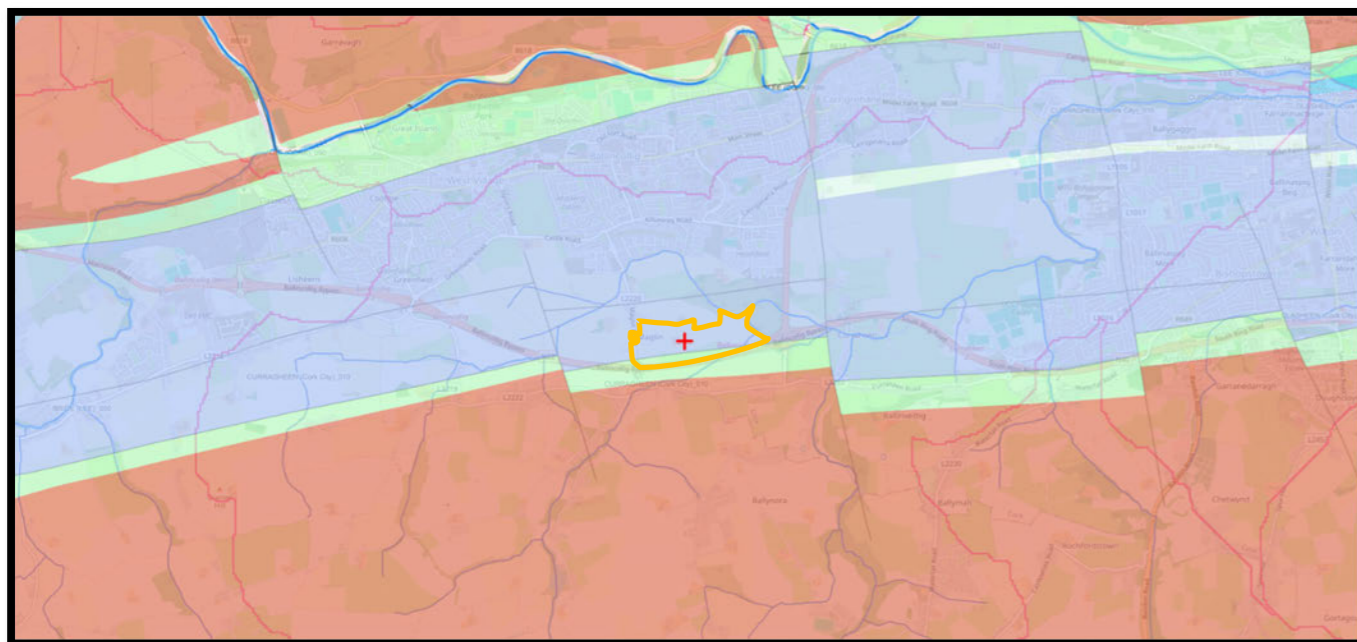
**Image 10.2.1: EPA Map of 19\_17 Glasheen (Cork City)\_SC\_010 WFD Sub-Catchment.**  
 (Site is shown by the red cross).



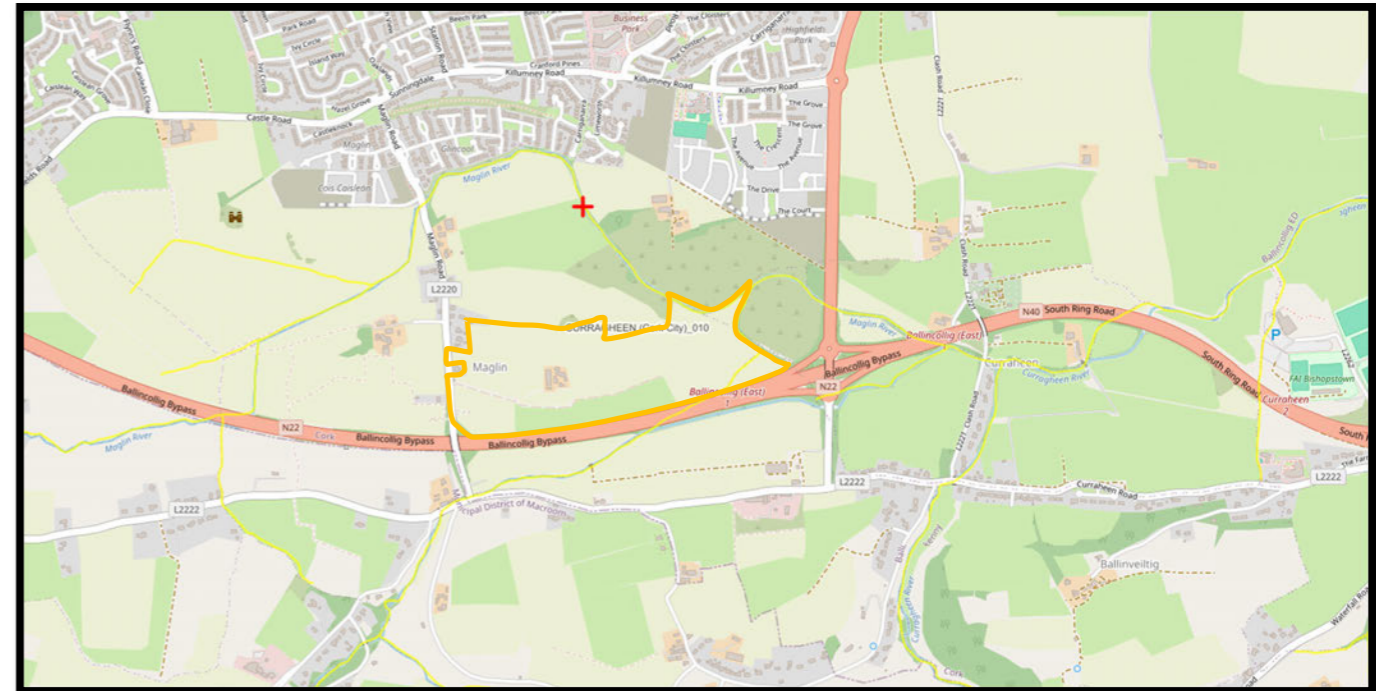
**Image 10.2.2: EPA Map of site located in Curragehen (Cork City)\_010 EPA River Sub-Basin Catchment.**  
 (There are four River Sub-Basin Catchments within the Glasheen Sub-Catchment.)



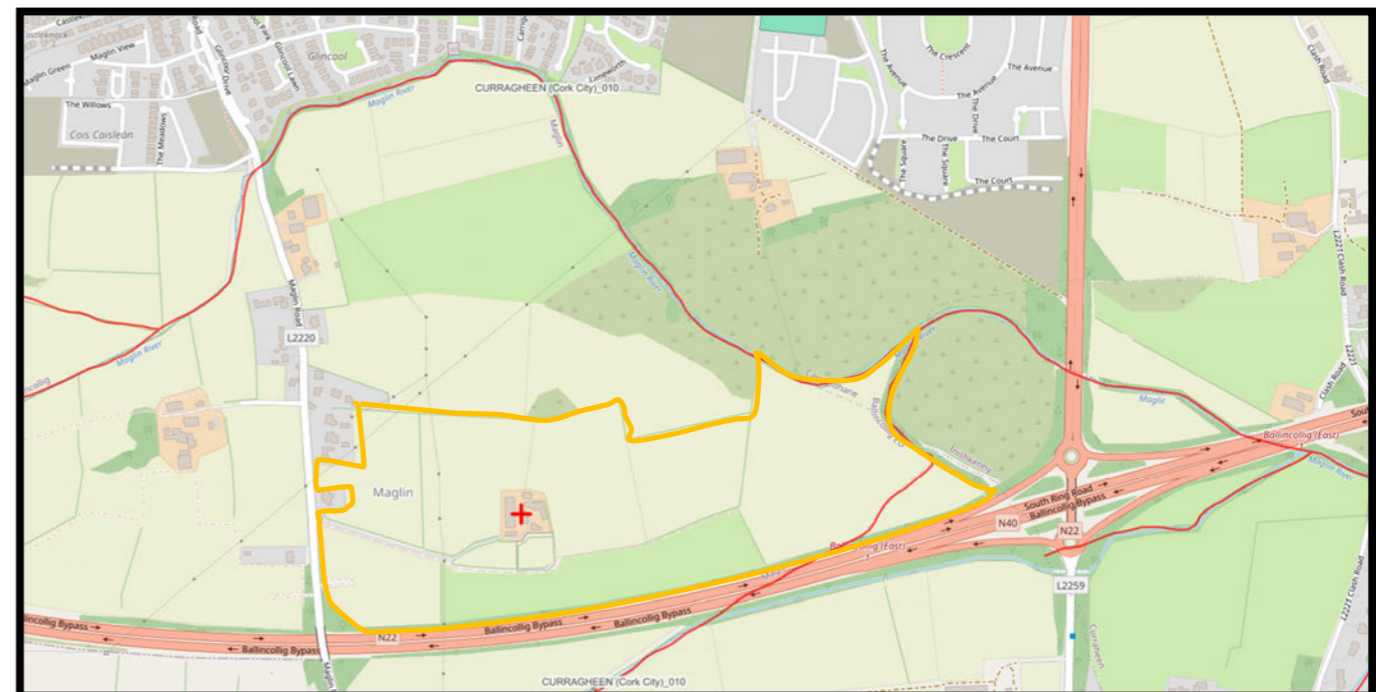
**Image 10.2.3: EPA Map of site located between the Grange Hill River (North) & Maglin River (South).  
 (There are three watercourses with the Curraheen Catchment with the two rivers (as above) joining the Curraheen Stream to the east of the site.)**



**Image 10.2.4: EPA Map of Rock Unit Groups with ORS (brown), Cork Group (green) and DPBL (Blue).**



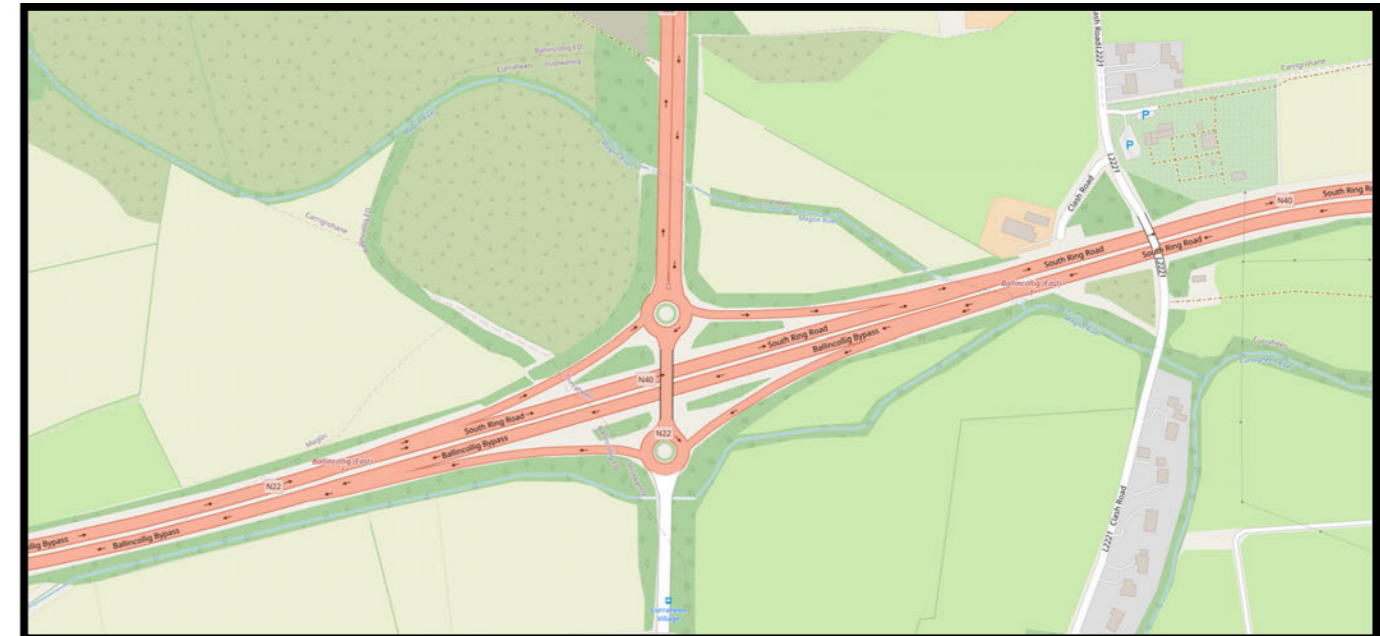
**Image 10.2.5: EPA Map with WFD Water Body Quality Status for 2016 to 2021 as Moderate (yellow).**



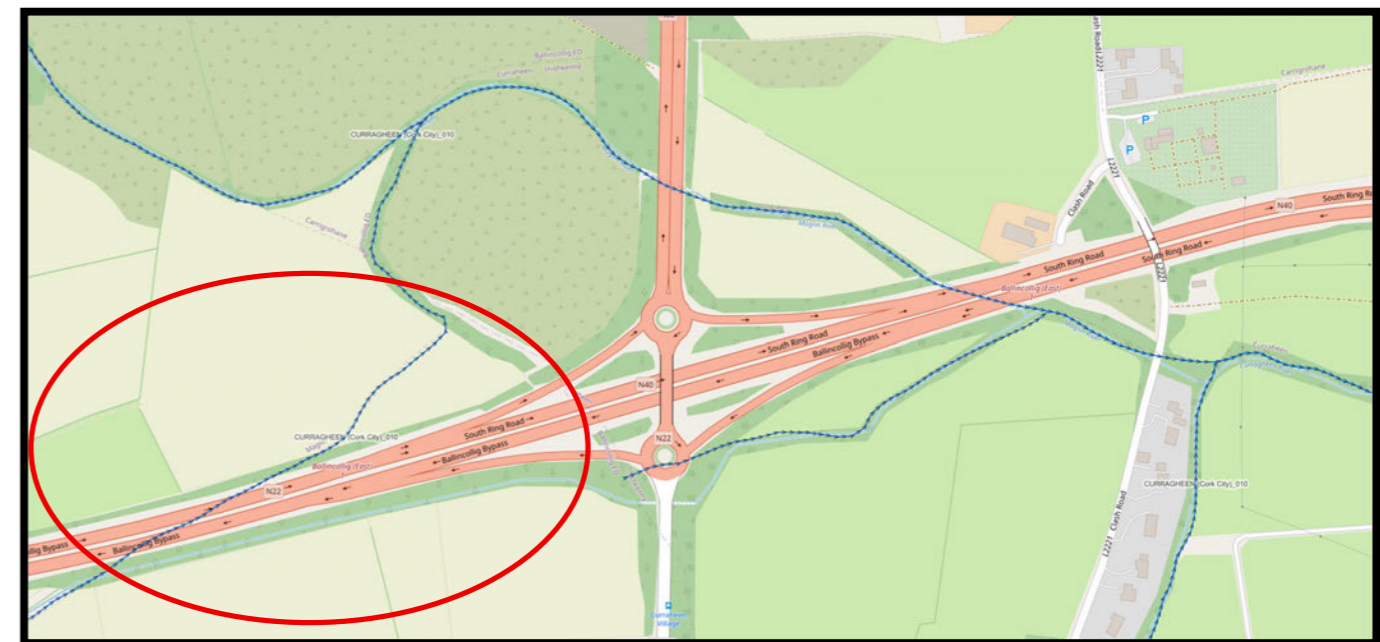
**Image 10.2.6: EPA Map showing WFD 3<sup>rd</sup> Cycle Water Body Risk Status as 'At Risk', (red).  
 (The EPA describe the watercourses being at risk due to human caused Anthropogenic Pressures.)**

**APPENDIX 10-3 EPA Hydrology Maps**

Maglin LSD EIR Chapter 10 - Water  
**Appendix 10.3 – EPA Hydrology Maps**



**Image 10.3.1: EPA Base Map of local watercourses – with channel of Maglin River along southern motorway boundary and Grange Hill River flowing under link road.**



**Image 10.3.1: EPA Base Map of local area with River Waterbodies activated – note that the channel of Maglin River is now shown to be (in error) along its pre-motorway flow path, not flowing along southern motorway boundary, but cutting across the field to join the Grange Hill River at the eastern end of the site.**

**APPENDIX 10-4 GSI Mapping**

Maglin LSD EIAR Chapter 10 - Water  
**Appendix 10.4 – GSI Mapping**



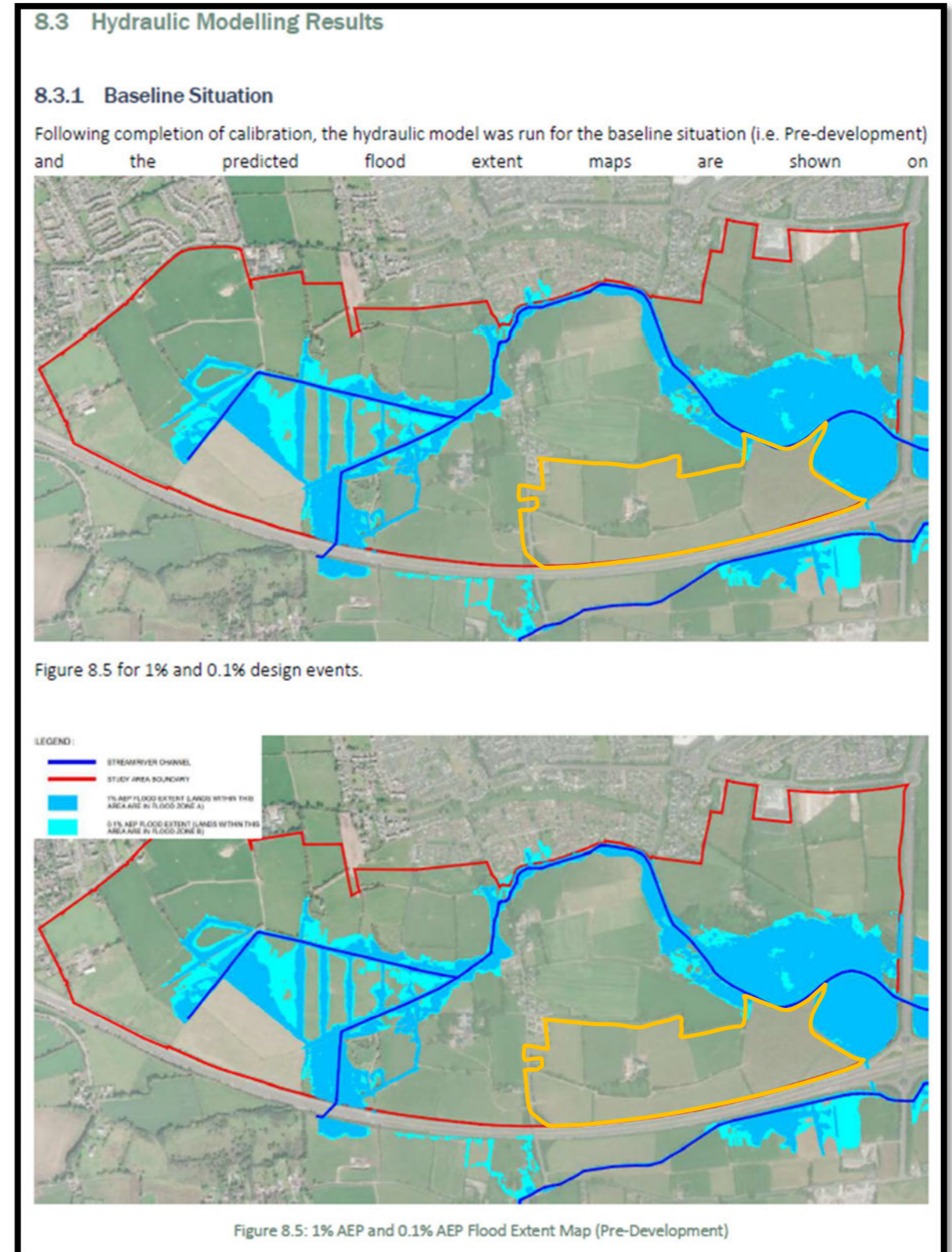
**Image 10.4.1: EPA Soil Mapping showing site covered by Glacial Sandstone Till (TDSs) (Dark Blue). (Areas of Rock Close (yellow) and start of Alluvial Sands & Gravels (orange) further to the east.)**



**Image 10.4.2: EPA Hydrology Soil Mapping with Well Drained (green) Till over the majority of the site. (An area of poorly drained soil (grey) is identified in the east field but this has since been buried with fill material from the N22 motorway construction.)**

**APPENDIX 10-5 MWP Flood Maps**

Maglin LSD EIA Chapter 10 - Water  
**Appendix 10.5 – MWP Flood Maps**



**Image 10.5.1: Extract from CCC South Ballincollig FRA & Drainage Statement (MWP 2021)**

Chapter 10. Water - Maglin Residential LSD EIAR  
 Appendix 10.5: CCC Flood Risk Maps (from MWP Report)

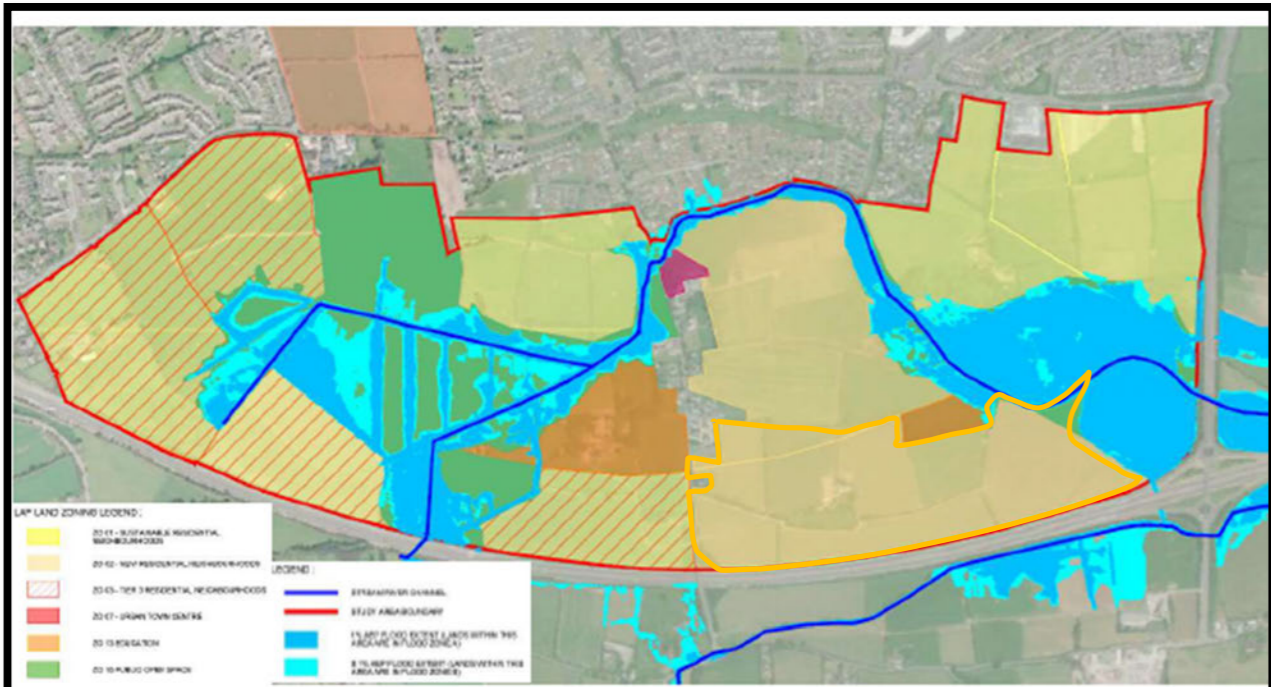


Figure 11.1: Flood Zones & Proposed Development Plan Zoning

Zoning Objective	Zoning Description	Vulnerability	Flood Zone *	Justification Test Requirements
ZO 01	Sustainable Residential Neighbourhoods	Highly Vulnerable Development	C	Not Required
ZO 02	New Residential Neighbourhoods	Highly Vulnerable Development	C	Not Required
ZO 03	Tier 3 Residential Neighbourhoods	Highly Vulnerable Development	C	Not Required
ZO 07	Urban Town Centre	Less Vulnerable Development	C	Not Required
ZO 13	Education	Highly Vulnerable Development	C	Not Required
ZO 16	Public Open Space	Water Compatible Development	A/B/C	Not Required
-	New Spine Road	Less Vulnerable Development	A/B/C	Required

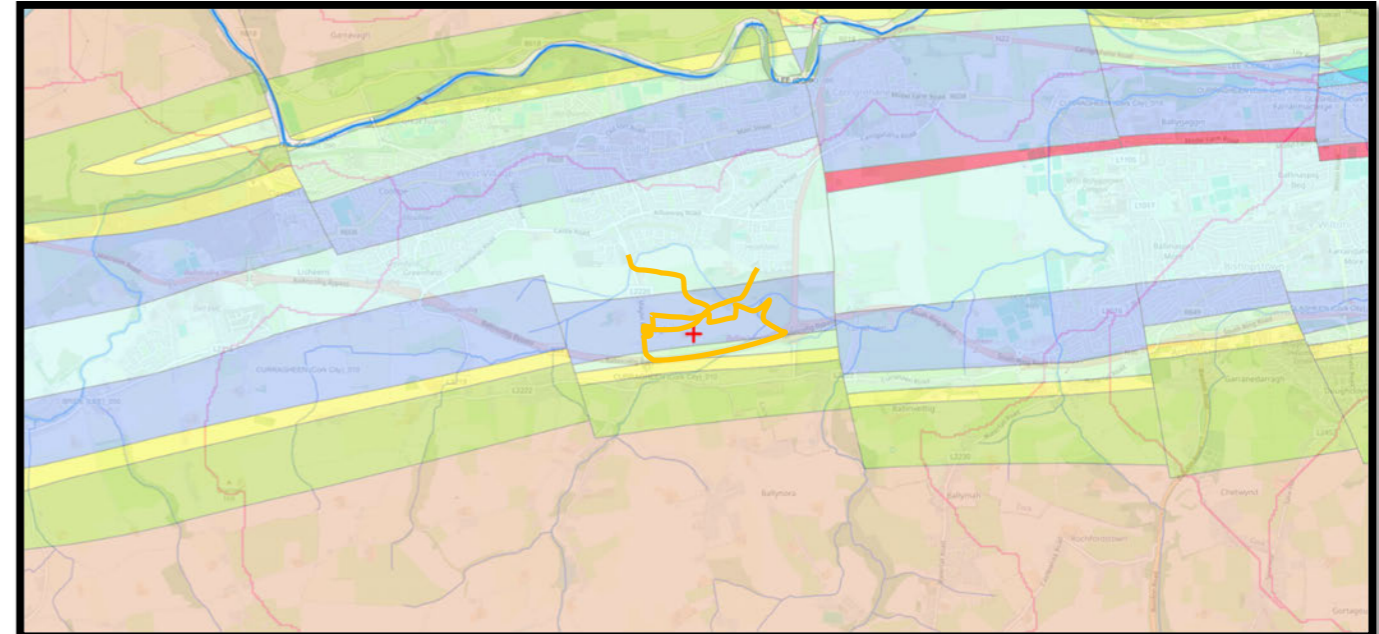
\* There may be some localised fringes of the Zoning located in Flood Zones A or B – Refer to Figure 11.2 and discussion in Section 11.2.

Table 11.1: Land Use Zoning & Vulnerability Classification

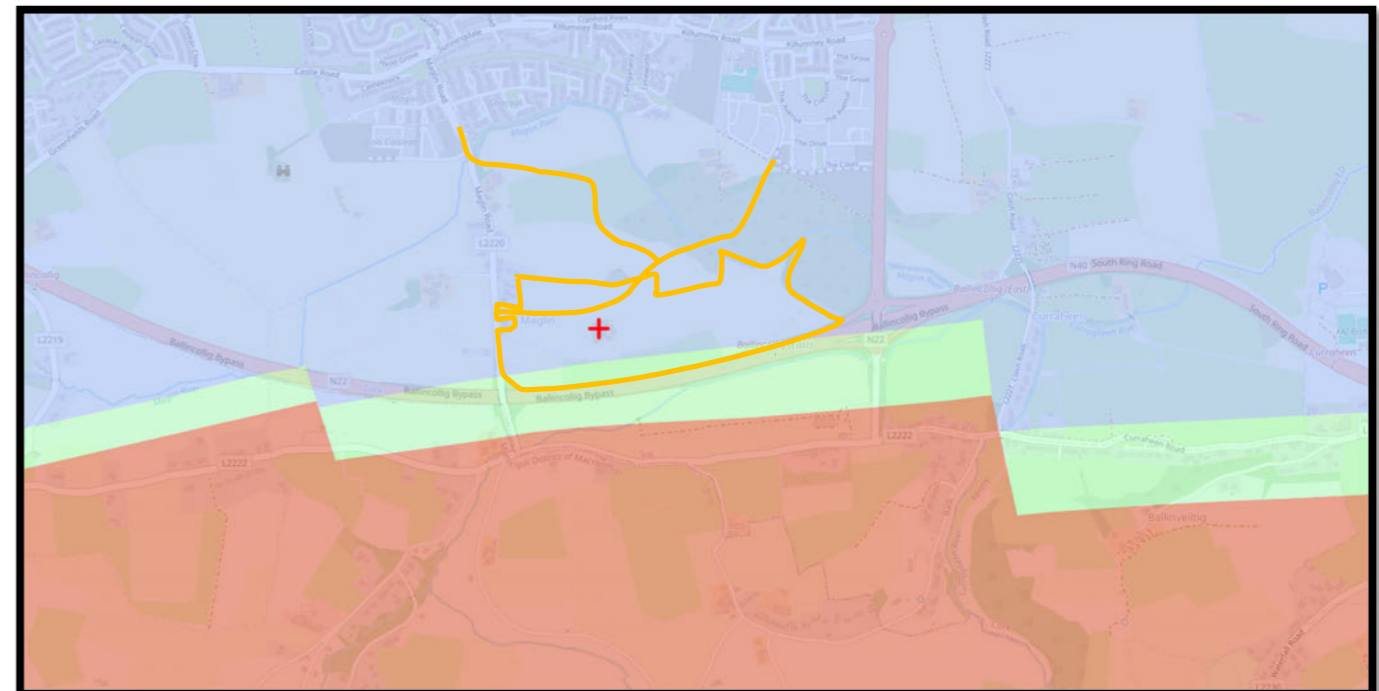
Image 10.5.2: Extract from CCC South Ballincollig FRA & Drainage Statement (MWP 2021)

**APPENDIX 10-6 EPA & GSI Groundwater Maps**

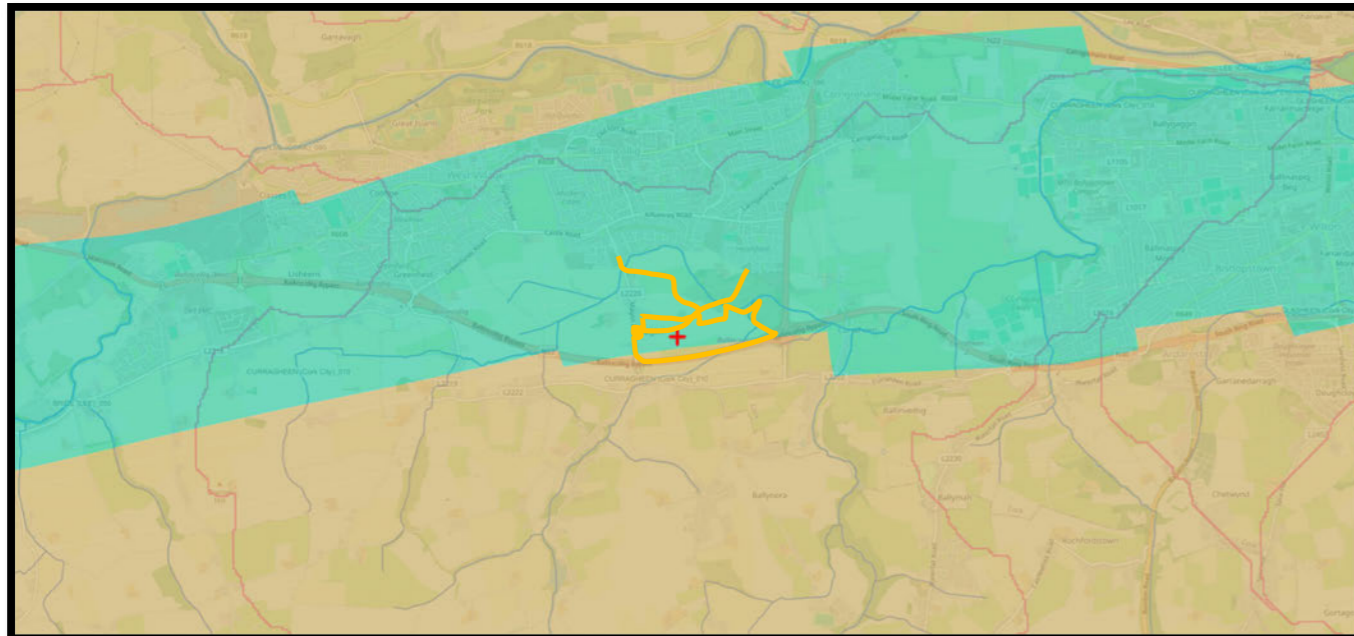
Maglin LSD EIA Chapter 10 - Water  
**Appendix 10.6 – EPA & GSI Groundwater Maps**



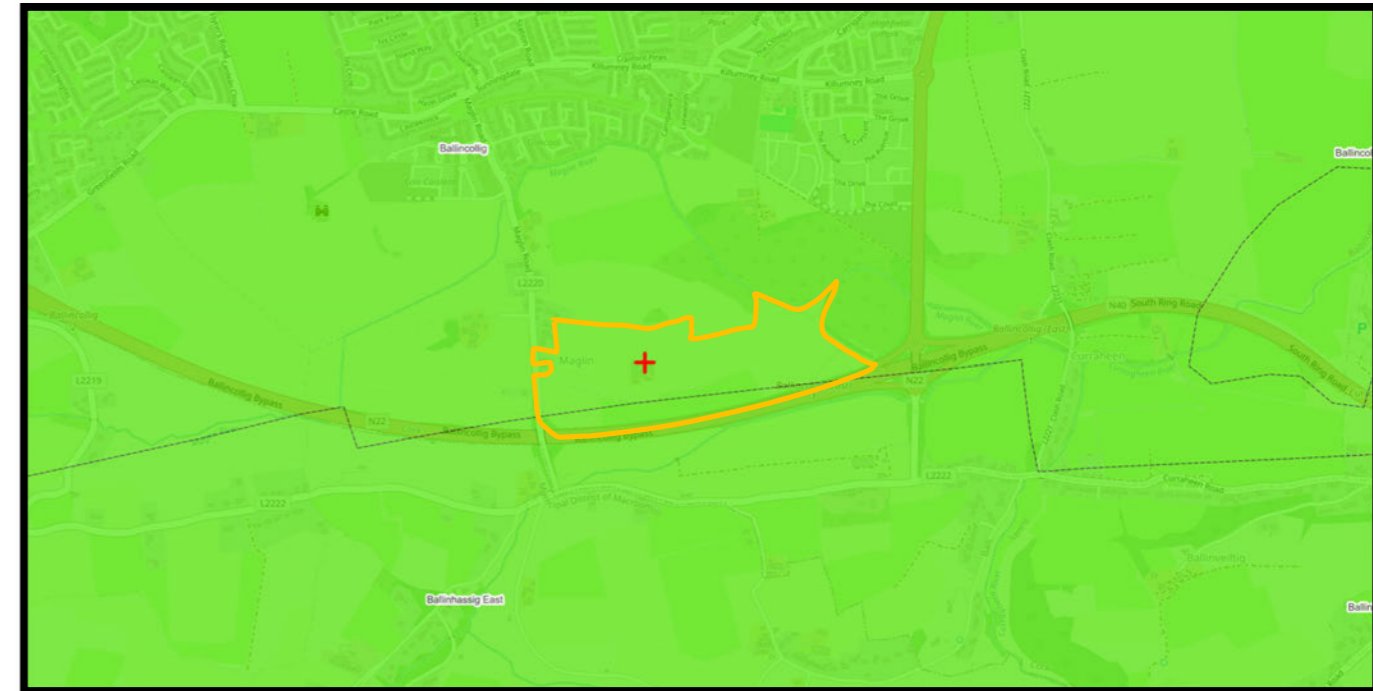
**Image 10.6.1: EPA Geology Bedrock Map with site predominately over limestone formations. (Waulsortian Limestone (WA) (Dark Blue) and Little Island Formation (LI) (Light Blue).**



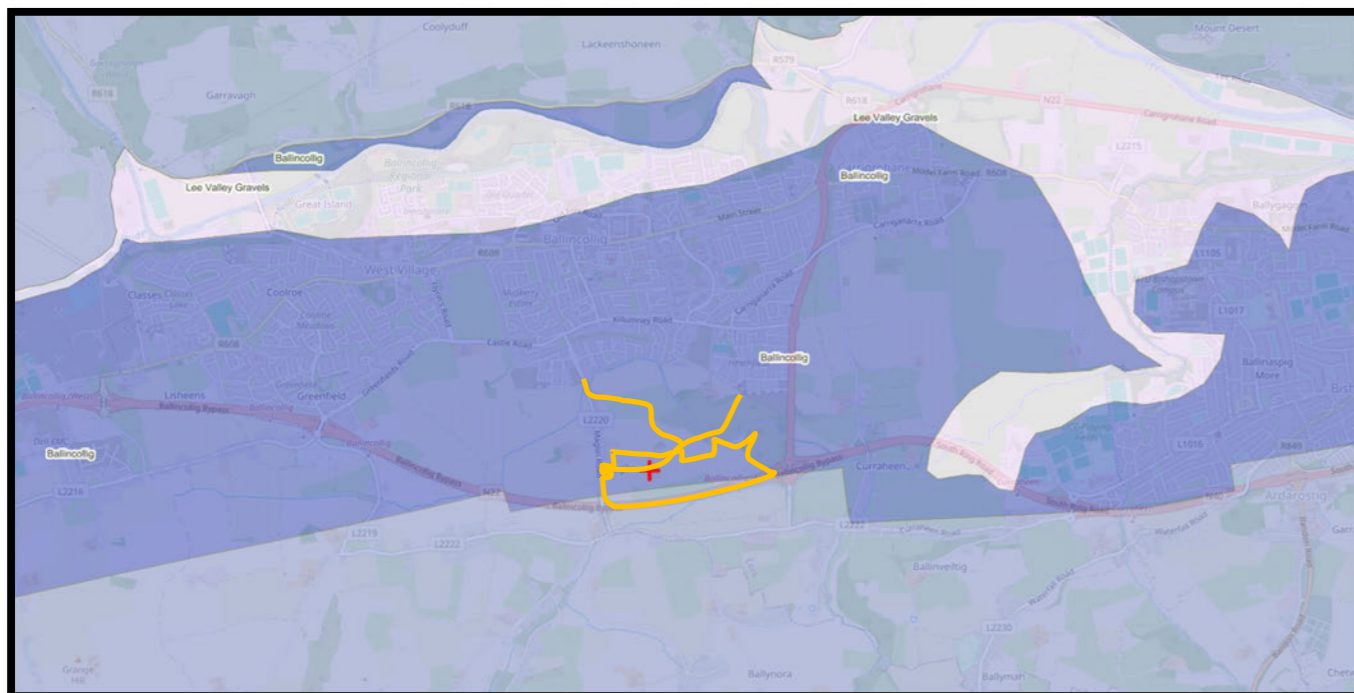
**Image 10.6.2: EPA Map of Rock Unit Groups with ORS (brown), Cork Group (green) and DPBL (Blue).**



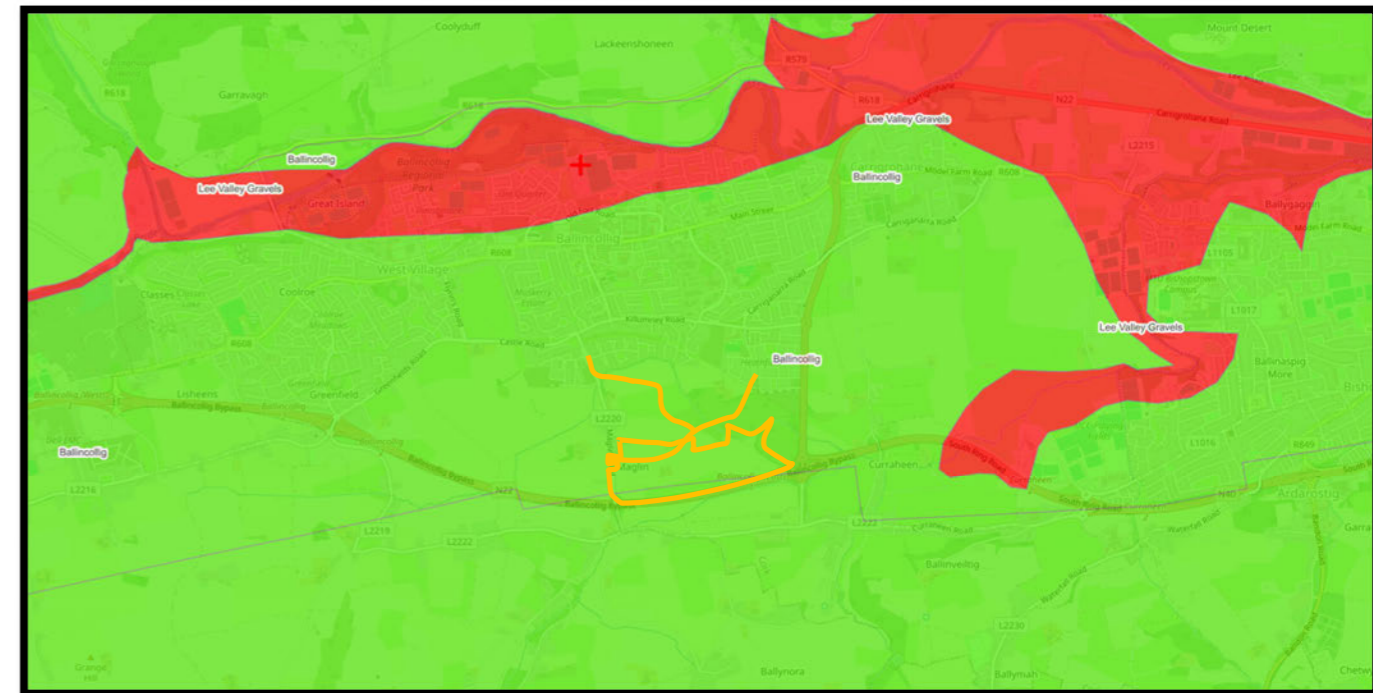
**Image 10.6.3: EPA Aquifer Map with Regionally Important Aquifer (Green) and Locally Important Aquifer (Brown)**



**Image 10.6.5: EPA Map with WFD Groundwater Body Quality Status for 2016 to 2021 as Good (green).**



**Image 10.6.4: EPA Map of WFD Groundwater Bodies with Ballincollig (purple) and Ballinhassig East (grey) under the site and the Lee Valley Gravels (white) to the north and east.**



**Image 10.6.6: EPA Map with WFD 3<sup>rd</sup> Cycle Groundwater Body Risk Status as 'Not at Risk', (green).**

**(Note that Lee Valley Gravels are considered to be 'At Risk' (red).**

# CHAPTER ELEVEN

## BIODIVERSITY

APPENDIX 11-1 Bat Report  
APPENDIX 11-2 Bird Report

**APPENDIX 11-1 Bat Report**

July 2025

# Bat Report

## Proposed Housing Development LRD

**O'Flynn Construction Co. Unlimited  
Company  
Maglin, Co. Cork**



MALONE O'REGAN

### Form ES - 04



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### Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	08/07/25	Bat Report	Final	SL	HT	DH

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**Bat Report**  
**Proposed Housing Development LRD**  
**O'Flynn Construction Co. Unlimited Company**  
**Maglin, Co. Cork**

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## 1 INTRODUCTION

This Bat Survey Report has been prepared by Malone O'Regan Environmental ('MOR Environmental') on behalf of O'Flynn Construction Co. Unlimited Company ('the Applicant'), to present the findings of bat surveys undertaken at a site for the development of a proposed Large-Scale Residential Development ('LRD') and ancillary works.

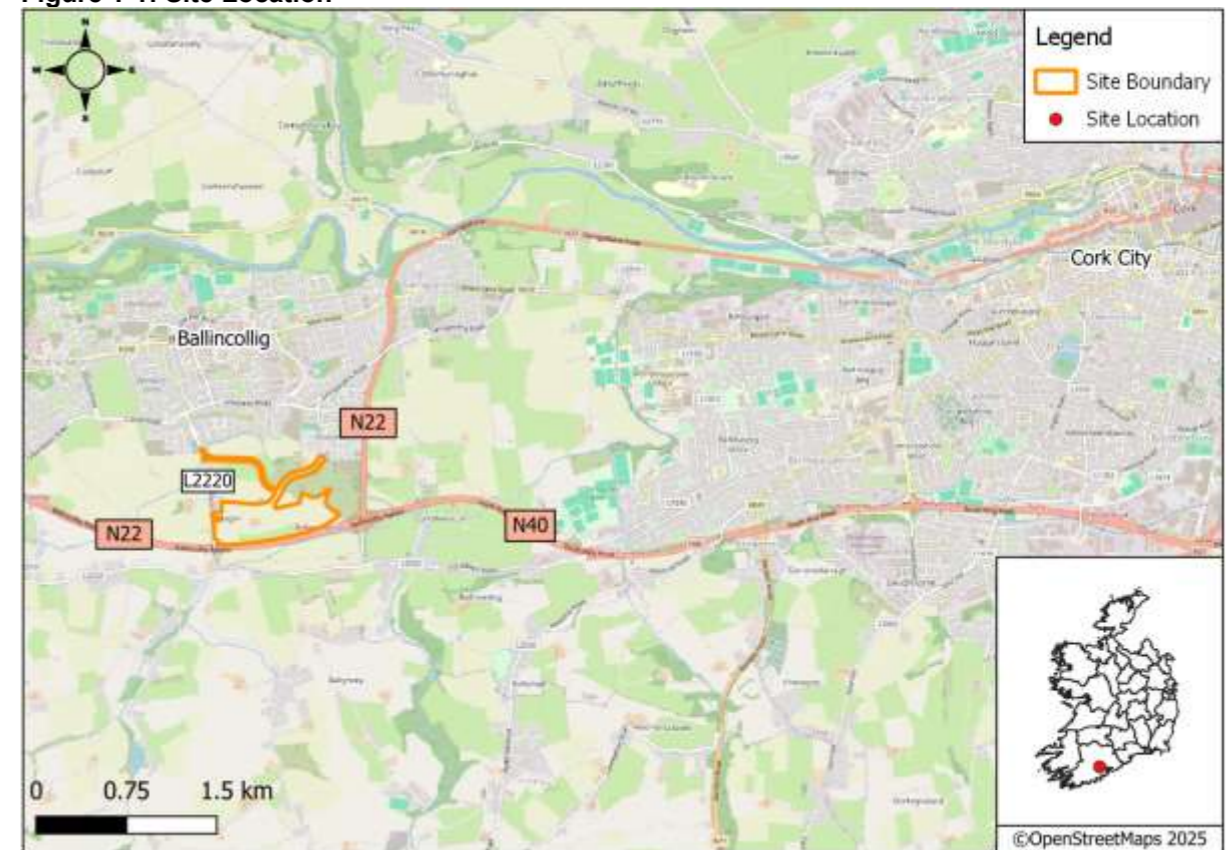
The Proposed Development will be located on a site that is located within townlands of Maglin, Curraheen, Carrigrohane and Ballynore, Co. Cork (ITM Reference: X: 559844 Y: 569377), circa ('ca.') 870m south of Ballincollig Town Centre and ca. 7.2km southwest of Cork City Centre ('the Site').

This bat report is an Appendix to Chapter 11 – Biodiversity of the Environmental Impact Assessment Report ('EIAR') submitted as part of the Planning Application to Cork County Council. This bat report should be read in conjunction with the EIAR

A baseline ecological survey of the Site was undertaken on 31<sup>st</sup> August 2023. The baseline ecological survey highlighted the potential for bats to utilise the Site for roosting, foraging and commuting. It was therefore deemed necessary for further survey work to be carried out to determine whether or not bats would be negatively impacted by the works associated with the Proposed Development.

The location of the Site is shown in Figure 1-1.

**Figure 1-1: Site Location**



## 1.1 Relevant Legislation

All Irish bat species are protected by law under the Wildlife Act 1976 and its subsequent amendments. They are afforded full protection under this act, which makes it a criminal offence for anyone without a licence to:

- Kill, injure or handle a bat;
- Possess a bat (whether alive or dead);
- Disturb a roosting bat; and,
- Damage, destroy or obstruct access to any place used by bats for shelter, whether they are present or not.

In addition to domestic legislation, bats are also protected under the EU Habitats Directive (92/43/EEC). All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat is further listed under Annex II, which make it an offence to:

- Deliberately capture, injure or kill any bat; or,
  - Deliberately disturb a bat, in particular any disturbance which is likely;
  - (a) To impair their ability:
    - (i) To survive, to breed or reproduce, or to rear or nurture their young; or,
    - (ii) To hibernate or migrate.
  - (b) To affect significantly the local distribution or abundance of the bat species;
- or,
- Damage or destroy a breeding site or resting place of a bat.

Therefore, the destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation license must be obtained from the National Parks and Wildlife Service ('NPWS') before works can commence.

Furthermore, it should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a license to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS.

## 1.2 Statement of Authority

The bat report was prepared by the following MOR Environmental personnel: Ms Stephanie Lonergan and Mr Dyfrig Hubble.

Stephanie Lonergan, Environmental Consultant, has a B.A. (Mod) (Hons) in Environmental Science. Stephanie is a qualifying member of the Chartered Institute of Ecology and Environmental Management ('CIEEM') with a particular interest in bat ecology and conservation. Stephanie has completed courses on bat ecology, identification, handling, biometrics and mitigation with CIEEM and Bat Conservation Ireland. Stephanie has undertaken training run by Wildlife Acoustics for analysis of bat calls in Kaleidoscope Pro Software and regularly uses this programme within her role at MOR Environmental. Stephanie has experience undertaking bat surveys and tree / building assessments, and regularly attends events held by local bat groups.

This report was reviewed and approved by Mr. Dyfrig Hubble, Associate Director – Ecologist. Dyfrig has a B.Sc. (Hons) in Tropical Environmental Science and an M.Sc. in Environmental Forestry. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management. Dyfrig has over 18 years' experience working in the ecological consultancy

sector, including habitat appraisals and specialist species-specific surveys. Dyfrig has extensive experience in undertaking a variety of bat surveys including dawn / dusk surveys, transects, static monitoring, harp trapping and Lesser Horseshoe roost counts. Dyfrig has also worked on numerous projects that have required supervision of building demolition and tree removal works under licence. These projects have included work both in the UK and Ireland.

## 1.3 Species Background

There are eleven recorded bat species in Ireland, nine of which are considered resident and two of which are considered vagrants (Please see Table 1-1 below).

**Table 1-1: Status of Irish Bat Species**

Bat Species	Irish status	European Status
<b>Resident Bat Species</b>		
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	Least Concern	Least Concern
Brown Long-eared Bat ( <i>Plecotus auritus</i> )	Least Concern	Least Concern
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	Least Concern	Least Concern
Lesser Horseshoe Bat ( <i>Rhinolophus hipposideros</i> )	Least Concern	Near Threatened
Whiskered Bat ( <i>Myotis mystacinus</i> )	Least Concern	Least Concern
Daubenton's Bat ( <i>Myotis daubentonii</i> )	Least Concern	Least Concern
Leisler's Bat ( <i>Nyctalus leisleri</i> )	Least Concern	Least Concern
Nathusius' Pipistrelle ( <i>Pipistrellus nathusii</i> )	Least Concern	Least Concern
Natterer's Bat ( <i>Myotis nattereri</i> )	Least Concern	Least Concern
<b>Vagrants</b>		
Brandt's bat ( <i>Myotis brandtii</i> )	Data Deficient	Least Concern
Greater Horseshoe Bat ( <i>Rhinolophus ferrumequinum</i> )	Data Deficient	Near Threatened

### 1.3.1 Types of Bat Roosts

Bats were originally cave and tree-dwelling animals, but many now use buildings to roost within. Buildings are highly important as roosting sites for all Irish bat species, as they use buildings for all roost types. Most significant in terms of roosts in buildings are maternity roosts, but cellars and attics can serve as hibernation sites for bats. Roosts within buildings can far exceed the numbers encountered in trees, bridges, caves or cliffs and roosts of over 1,000 bats have been recorded in buildings [1].

Bats are social animals, and most species congregate in large colonies during the later spring / summer. These colonies consist mostly of females, with some juvenile males from the previous year. Male bats normally roost individually or in small groups, meeting up with the females in the late autumn, when it is time to mate. In summer, bats seek warm, dry buildings in which they can give birth and suckle their young. In winter, they seek out places with a constant low temperature and high humidity where they can become torpid and hibernate during adverse weather conditions. However, bats do not hibernate continuously during winter

and will awake and hunt during mild nights when there are insects available and it is energetically advantageous to forage [2].

One purpose of daytime tree or building inspections is to determine the potential of bat roosts within the survey area. Due to the transient nature of bats and their seasonal life cycle, there are a number of different type of bat roosts. Where possible, one of the objectives of the surveys is to be able to identify the types of roosts present, if any.

Bats in Ireland feed exclusively on insects, and in the summer months (May – September), they generally emerge from their roosts around sunset to feed. Bats are known to use a number of different foraging sites in the same night and move between them to locate areas of high insect concentrations. They are also known to exhibit site loyalty and will return to the same foraging sites night after night [2].

Table 1-2 below defines the various types of bat roosts.

**Table 1-2: Bat roost types (definitions written by the NE Earned Recognition Project) [2]**

Roost Type	NE Definition
Day Roost	A place where individual bats or small groups, rest or shelter in the day during the summer.
Night Roost	A place where bats rest or shelter in the night but are not found in the day. May be used by a single individual on occasion, or it could be used regularly by the whole colony.
Feeding Roost	A place where individual bats, or few individuals, rest or feed for short periods during the night but are not present by day.
Transitional Roost	A place used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Maternity Site	A place where female bats give birth and raise their young to independence. In some species males may also be present in the maternity roost.
Hibernation Site	A place where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite Roost	An alternative roost found in close proximity to the main nursery colony used by a few individuals to small groups of breeding females throughout the breeding season.

#### 1.4 Purpose of Survey Work

The implication of these legislative policies is that the Proposed Development needs to take account of the potential effects on bats. Survey work is necessary to establish whether the species are currently present in areas where suitable habitat exists and in areas where bats have previously been recorded. Survey work also enables appropriate mitigation measures to be incorporated into the design of the project and ensures that there are no adverse effects on the conservation status of the species.

Survey work was deemed necessary based on desktop surveys and suitable habitat for roosting, foraging and commuting bats being identified during the initial walkover of the Site.

## 2 METHODOLOGY

The methodologies used to establish the presence / potential presence of bats are summarised below.

### 2.1 Desk-Based Studies

A desk-based study was undertaken to identify records of bats within the survey area. The following sources of information were reviewed:

- The NPWS website was consulted to obtain the most up-to-date details on conservation objectives for the European sites relevant to this assessment [3];
- Aerial mapping was reviewed to identify any habitats and features likely to be used by bats. Maps and images of the Study Area and general landscape were examined for suitable foraging or commuting habitats, including woodlands and forestry, hedgerows, treelines, and watercourses;
- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to bat species distributions and bat habitat suitability index [4].

### 2.2 Field-Based Studies

The survey design was informed by previous experience and the following publications:

- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes [1];
- A Conservation Plan for Irish Vesper Bats Irish Wildlife Manual No. 20 [5];
- UK Bat Mitigation Guidelines: A guide to impact assessment, mitigation and compensation for developments affecting bats [6];
- Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25 [7] a publication by the NPWS;
- Bat Surveys for Professional Ecologists - Good Practice Guidelines (3rd ed.). London: The Bat Conservation Trust [8]; and,
- Bat Surveys for Professional Ecologists - Good Practice Guidelines (4<sup>th</sup> ed.). London: The Bat Conservation Trust [2].

#### 2.2.1 Walkover and Identification of Bat Habitats

The Site was assessed during the daytime walkover survey on the 31<sup>st</sup> August 2023 in relation to potential bat roosting, foraging habitat and potential commuting routes. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine connectivity for local bat populations, and through the examination of aerial mapping.

#### 2.2.2 External Building Inspection

An external inspection of the buildings onsite was undertaken by two MOR Environmental Ecologists on the 31<sup>st</sup> August 2023. As part of the walkover, all buildings that are due to be impacted by the Proposed Development area were assessed for the presence of features that could be utilised by roosting bats using close-focusing binoculars.

The inspection aimed to assess the building for the presence of features suitable for roosting bats. These features include:

- Windowsills;
- Window panes;

- Lifted rendering;
- Hanging tiles;
- Weatherboarding eaves;
- Soffit boxes;
- Fascias;
- Lead flashing;
- Gaps under felt; and,
- Gaps in brickwork or stonework.

Signs of roosting bats searched for included:

- Evidence of bat droppings / urine splashes;
- Bat specimens (live or dead);
- Evidence of feeding remains, (insect wings on the floor); and,
- Evidence of fur-oil staining.

Assessment criteria for evaluating the potential suitability of the Site for bats was done in concurrence with 'Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed)' [8], which was the most up-to-date guidance at the time.

### 2.2.3 Tree Inspection

As part of the walkover, all trees within the Site and adjoining lands were assessed for the presence of features that could be utilised by roosting bats, using close-focusing binoculars and a powerful focused-beam light source. The following criteria were used:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc;
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts;
- Adjoining habitat which are likely to be important to bats, including the river corridor, and hedge / treelines within the survey area that offer a variety of potential foraging, roosting and commuting opportunities for bats; and,
- Adjoining potential roosts / known roosts identified. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting, and a nearby alternative roost is highly desirable.

### 2.2.4 Bat Surveys

#### 2.2.4.1 2023 Dusk Emergence and Transect Surveys

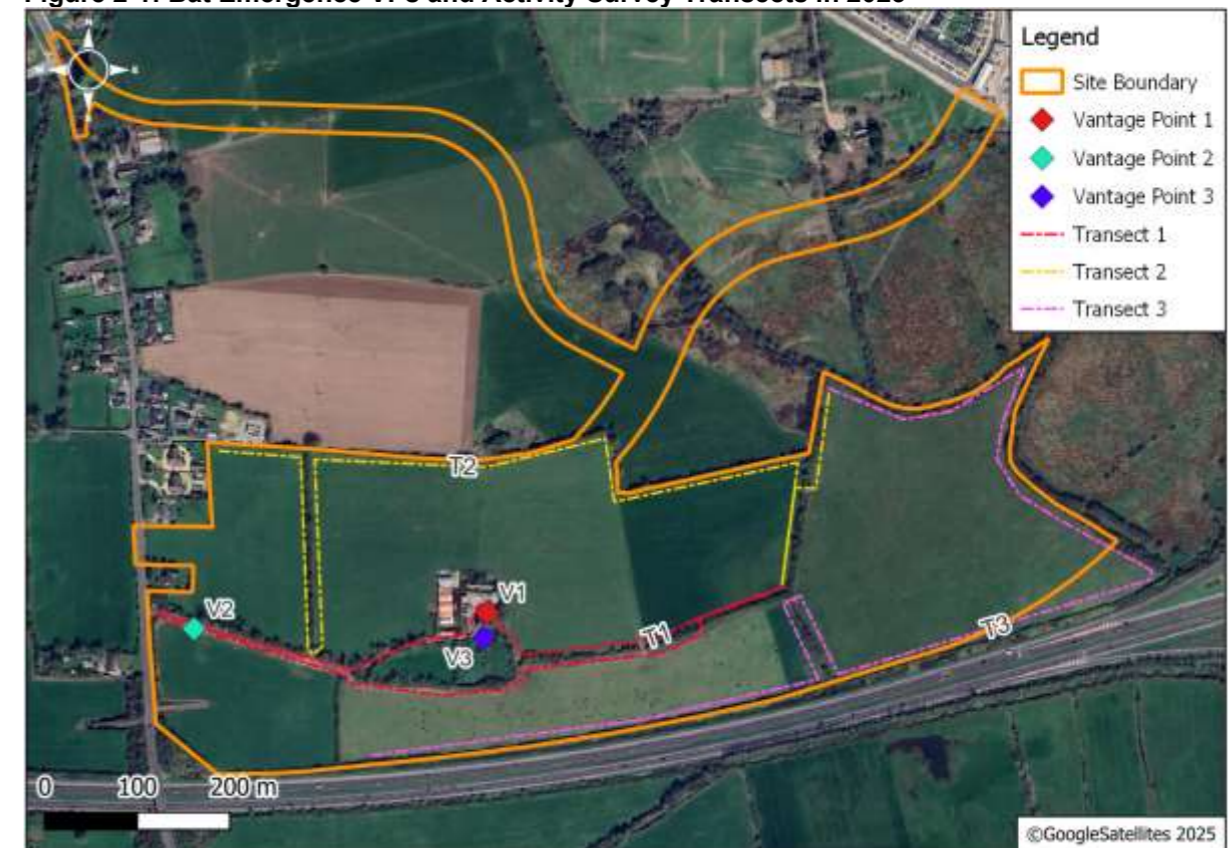
Two dusk emergence and activity surveys took place at the Site in 2023, the first on 13<sup>th</sup> September and the second on 26<sup>th</sup> September. The surveys commenced 15 minutes before sunset and ended 2 hours after sunset, therefore encompassing the typical emergence times of Irish bat species. The vantage points ('VPs') took place for one hour and fifteen minutes

and were designed to incorporate the abandoned farmhouse and all trees identified as having (Potential Roost Features) PRFs during the tree inspection. These trees were surveyed so they could be monitored for bat emergence. The transects ('T') took place for one hour after the VPs, and were designed to incorporate all treelines, linear features and other areas of the Site that the initial site visit identified as providing suitable habitats for foraging and commuting bats. The transects aimed to capture bat activity levels within the wider survey area and to determine what areas within the survey area are important habitats for bats.

Three MOR Environmental Ecologists surveyed separate locations of the Site - see Figure 2-2 below for full details of the VPs and transects walked during the surveys.

A combination of visual observation and listening to ultrasonic bat calls using an Echo Meter Touch2 Pro (Apple IOS) were used throughout the transect survey. Bat calls were recorded using this Echo Meter Touch2 Pro and stored on the EchoMeter App.

Figure 2-1: Bat Emergence VPs and Activity Survey Transects in 2023



#### 2.2.4.2 2024 Dusk Emergence and NBW<sup>1</sup> Surveys

Two dusk emergence and nighttime bat walkover ('NBW') surveys took place in 2024 – the first on 29<sup>th</sup> May and the second on 25<sup>th</sup> June. The VPs during these surveys changed to get a different observation on bat activity onsite from the previous year. See Figure

The methodology followed during these surveys was the same as the 2023 survey, where the VPs lasted one hour and 15 minutes (commencing 15 minutes before sunset), and the NBW survey took place after this for one hour.

<sup>1</sup> The 4<sup>th</sup> edition of Bat Conservation Trust's 'Bat Survey for Professional Ecologists – Good Practice Guidelines' refers to activity/transect surveys as 'Nighttime Bat Walkover' (NBW) surveys. It should be noted that the methodology for these surveys is the same as previously regarded transect/activity surveys.

A combination of visual observation and listening to ultrasonic bat calls were used during the emergence and NBW survey. Each surveyor used one HIKMICRO Lynx 2.0 Pro Thermal Monocular as a night vision aid (NVA) during the emergence survey to aid in monitoring the building onsite for bat emergence. The use of NVAs was in response to updated guidance released by the Bat Conservation Trust in October 2023 [2]. See Plates 2-1 to 2-3 below for the viewsheds from the NVAs used during the surveys.

Figure 2-2: Bat Emergence VPs and Activity Transects on 29/05/2024

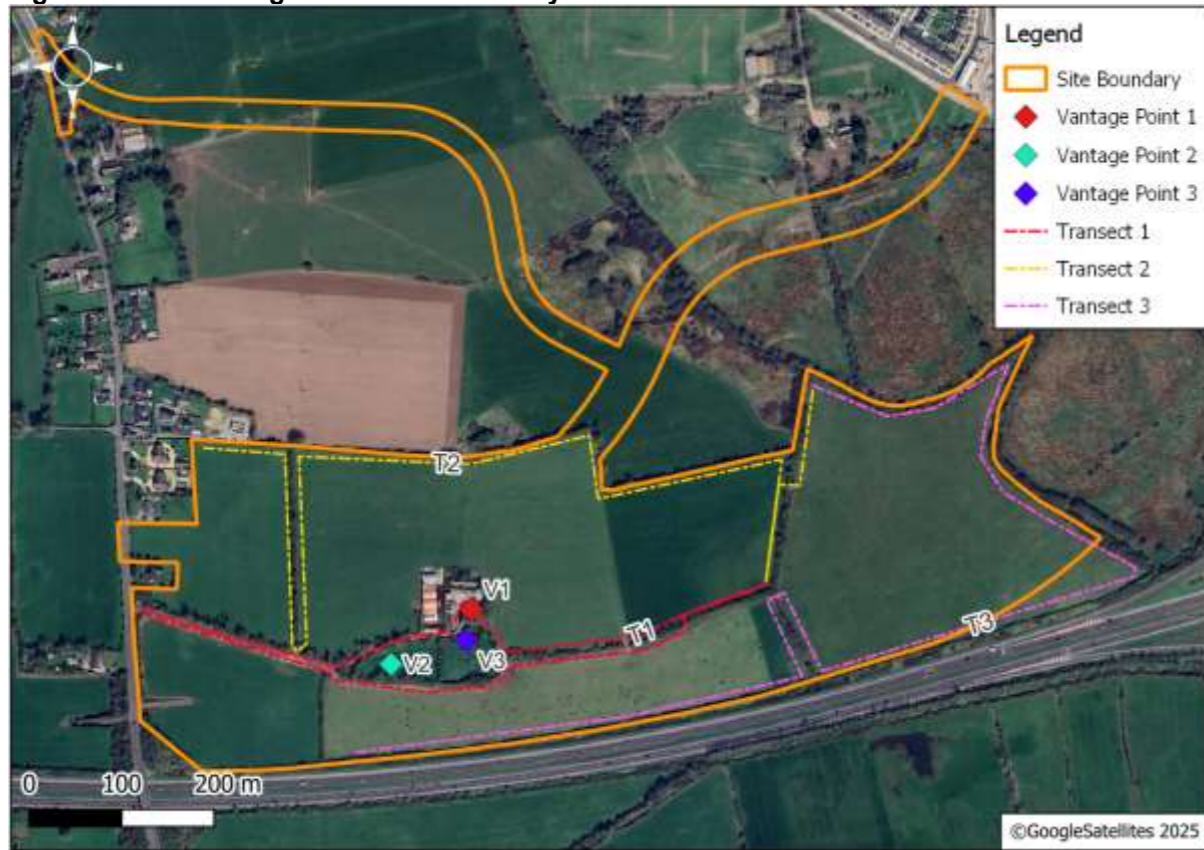


Plate 2-1: Viewshed from NVA at VP1 in 2024



Plate 2-2: Viewshed from NVA at VP3 in 2024

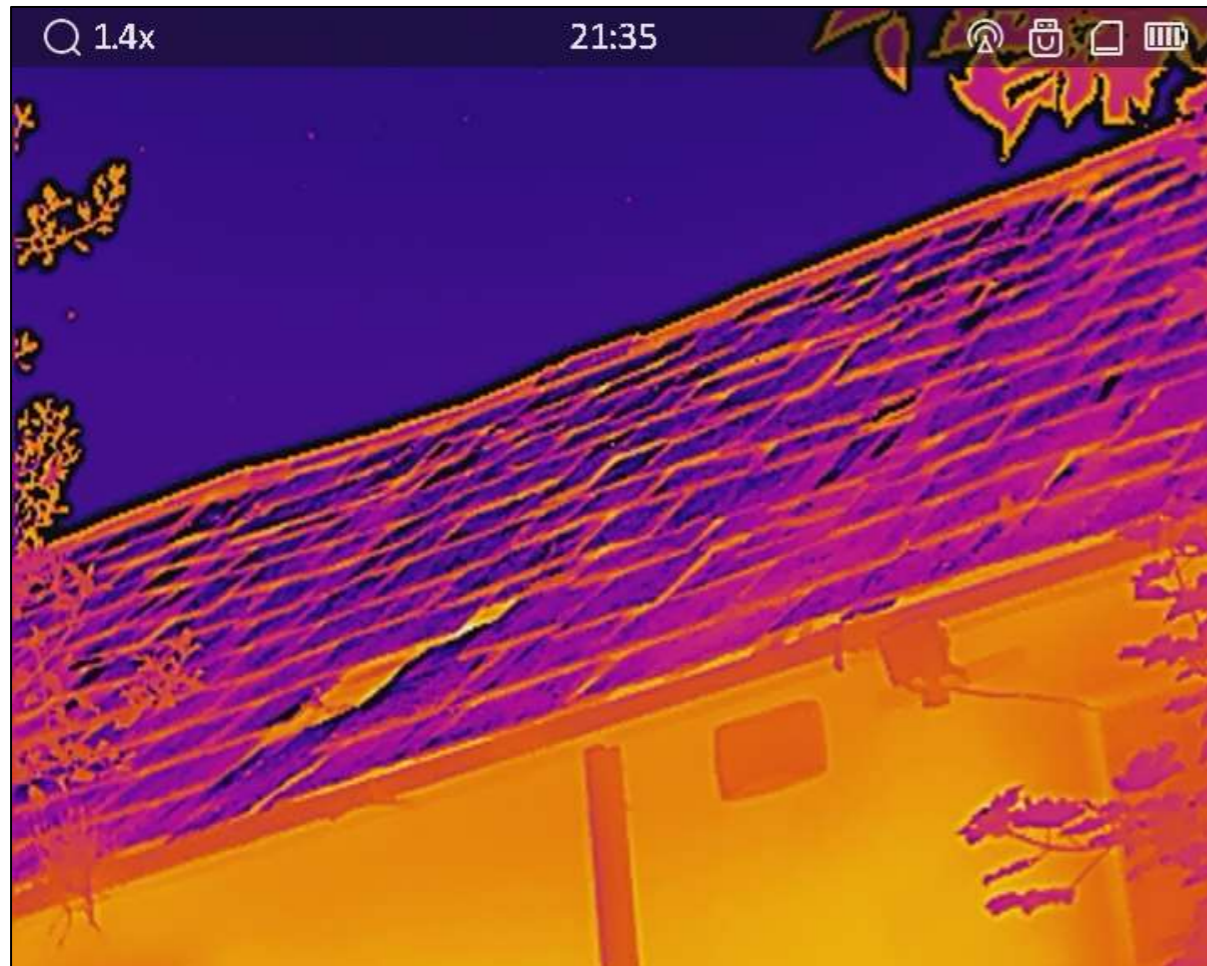


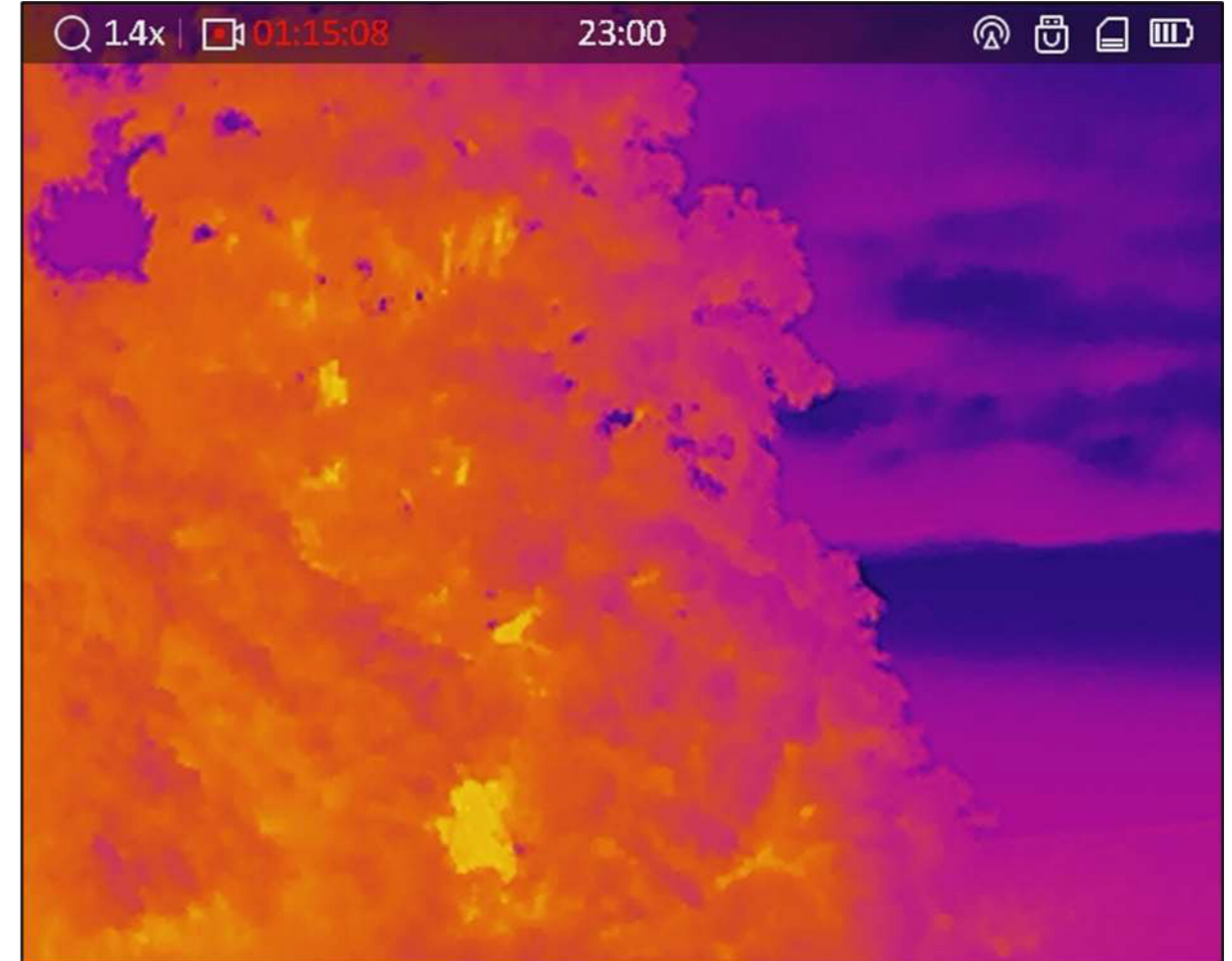
Figure 2-3: Bat Emergence VPs and Activity Transects on 25/06/2024



Plate 2-3: Viewshed from NVA at VP2 on 25/06/2024



Plate 2-4: Viewshed from NVA at VP3 on 25/06/2024



### 2.2.4.3 2025 Dusk Emergence and NBW Surveys

One updated NBW survey was undertaken at the Site on 13<sup>th</sup> May 2025. This survey followed the same predetermined transects as followed in the 2024 surveys (see Figure 2-3 above).

This survey commenced at sunset and ended two hours after sunset. The first hour of the NBW survey involved a stationary period to assess general levels of bat activity within the Site. The second hour of the survey involved surveyors walking the predetermined transect around the Site to assess activity along the linear features and other areas of the Site for foraging and commuting bats. During the NBW survey, the surveyors used an Echo Meter Touch2 Pro to listen for bat calls. Bat calls were recorded using the Echo Meter Touch2 Pro and stored on the EchoMeter App. A combination of visual observation and listening to ultrasonic bat calls was used during the NBW survey. Surveyors continuously recorded any signs of bat activity using the Echo Meter Touch2 Pro and noted any visual observations.

Two dusk emergence and NBW surveys also took place onsite in 2025 – the first on 22<sup>nd</sup> May 2025 and the second on 16<sup>th</sup> June 2025. The emergence survey commenced 15 minutes before sunset and continued until an hour after sunset. Two surveyors were positioned at predetermined VPs to survey the lodge in the southwest of the Site and also the east.

A combination of visual observation and listening to ultrasonic bat calls were used during the emergence and NBW survey. Each surveyor used one HIKMICRO Lynx 2.0 Pro Thermal Monocular as a night vision aid ('NVA') during the emergence survey to aid in monitoring the building onsite for bat emergence – see Plate 2-5 below for the viewshed from VP1 and Plate 2-6 for the viewshed from VP2.

Plate 2-5: NVA viewshed from VP1



Plate 2-6: NVA viewshed from VP2



The emergence survey commenced 15 minutes before sunset and took place until one hour after sunset. The NBW survey took place for one hour after the emergence survey and the surveyors walked two predetermined transects to assess other areas of the Site for foraging and commuting bats. Surveyors used an Echo Meter Touch2 during both the emergence and NBW survey and bat calls were stored on the EchoMeter App for analysis after the survey.

#### 2.2.4.4 Static Monitoring (SM4)

Two passive bat detectors, Wildlife Acoustics Song Meter 4-BAT (SM4s), were placed on two hedgerow / treelines within the Site for a period of static monitoring. Figure 2-4 below shows the locations where the SM4s were placed within the Site.

The SM4s were equipped with ultrasonic microphones and were left in specific locations for a specified period of time (seven nights – from 6<sup>th</sup> June – 13<sup>th</sup> June 2025). The SM4s were used as a bat activity data logger, as there was no surveyor present. Bats which passed near enough to the SM4 unit were recorded, and their calls were stored for analysis post monitoring period. This resulted in a far greater sampling effort over a shorter period of time.

The SM4s and the ultrasonic microphones were positioned in open spaces and locked in secure boxes so there would be no interference during the monitoring period. The SM4 bat loggers used real-time recording as a technique to record bat echolocation calls, and using specific software, the bat calls were identified. It was these sonograms of the bat calls (2-D sound graphs) that were digitally stored in the SD cards within the SM4s that were then downloaded for analysis.

These results were depicted in a table detailing the number of bat passes per species / per hour / night. Each bat pass did not correlate to an individual bat but was representative of the bat activity levels within the area. For example, some species of bats, such as *Pipistrellus* species, will continuously fly around a habitat. Therefore, it is likely that a series of bat passes within a similar timeframe could be the same pipistrelle bat. However, other bat species, such as Leisler's bats, tend to travel through an area quickly and therefore an individual bat pass is more indicative of the actual number of individual bats.

The total number of bat passes recorded per night and divided by the number of hours of recording, provides a figure for this analysis. The bat activity levels were determined as follows:

- None – 0 passes;
- Low = 1 - <10 passes per hour;
- Moderate = >10 - < 50 passes per hour; and,
- High = > 50 passes per hour.

All sound file data downloaded from the SM4s was analysed using Kaleidoscope Pro Software. The 'auto-ID' function was used to batch assign the top auto-ID species for each sound file. This approach allowed identification of bats to genus level for *Myotis* species, and to species level for other bats found in Ireland. The separation of *Myotis* species is complicated by the high degree of overlap between call characteristics. This software can also automatically sort sound files that contain only noise ('non-bat') from sound files that contain bat passes.

Following the batch analysis, all non-pipistrellus calls (excluding Nathusius' pipistrelle) and no ID calls were manually checked by a capable bat acoustic analyst. Auto-ID calls from common pipistrelle and soprano pipistrelle were not manually checked, as it is accepted that due to the lack of complexity within these species, the auto-ID function is sufficient.

Figure 2-4: SM4 Locations



### 2.2.5 Data Analysis

The bat recordings taken during the surveys were analysed using the software KaleidoscopePro to aid the identification of bat species present. A combination of the visual observations taken during the survey and the number of bat passes<sup>2</sup> identified on the recordings were used to determine bat activity levels within the area.

All sound file data recorded during the bat surveys was analysed using Kaleidoscope Pro Software. The 'auto-ID' function was used to batch assign the top auto-ID species for each sound file. This approach allows identification of bats to genus level for *Myotis* species, and to species level for other bats found in Ireland. The separation of *Myotis* species is complicated by the high degree of overlap between call characteristics. This software can also automatically sort sound files that contain only noise ('non-bat') from sound files that contain bat passes.

Following the batch analysis, all non-pipistrellus calls (excluding Nathusius' pipistrelle) and no ID calls were manually checked by a capable bat acoustic analyst. Auto-ID calls from common pipistrelle and soprano pipistrelle were not manually checked, as it is generally accepted that, due to the lack of complexity within these species, the auto-ID function is sufficient.

### 2.3 Survey Limitations

As mentioned in Section 2.2.2 above, during the 2023 surveys the most up-to-date guidance at the time was the 3rd edition of the Bat Conservation Trust's 'Bat Surveys for Professional Ecologists - Good Practice Guidelines' [8]. In October 2023, an updated 4th edition of this

<sup>2</sup> It is important to acknowledge that bat calls provide a measure of bat activity rather than the number of individuals in a population. In practice, bat activity (as, for example, represented by 100 recordings) could be from 100 bats passing the detector or one bat passing 100 times [2].

guidance was released by Bat Conservation Trust [2]. Therefore, during the 2024 updated emergence survey, the most up-to-date guidance was followed, which was the 4th edition of 'Bat Surveys for Professional Ecologists'.

It should be noted that northern section of the Site connecting the Site with Heathfield Park and Maglin Road were not surveyed as part of the bat surveys. These sections of the Site were added to the redline following the completion of surveys. However, the habitats of these areas were covered during the updated habitat surveys.

Bat surveys are a snapshot of the bat activity within an area at the time of surveying. It is therefore important that bat surveys are comprised of a number of surveys designed to provide as much information on the species and levels of bats using an area. Therefore, a combination of surveys was used to determine the importance of the survey area on local bat populations.

All survey work was conducted in accordance with current best practice guidelines, which dictate that bat surveys should be undertaken when there is no rain or wind, and the temperature is above 10°C. During the first dusk emergence survey on 13<sup>th</sup> September 2023, the survey had to end before the full 2 hours and 15 minutes. However, as the survey covered the typical emergence time of most bat species, it is not considered that this survey limitation significantly impacts the results of the survey.

During the dusk bat surveys, temperatures were between 11°C - 16°C (see Table 2-1 below).

**Table 2-1: Bat Survey Metadata**

Date	Survey Type	Sunset	Survey Times (Start-End)	Weather	Temperature (°C) Start - End
<b>2023 Surveys</b>					
13/09/2023	Dusk Emergence and Transect	19:57	19:42 – 20:47	Rain at 20:47, gentle breeze	16°C-16°C
26/09/2023	Dusk Emergence and Transect	19:24	19:09 – 21:24	Dry, gentle breeze	13°C - 11°C
<b>2024 Surveys</b>					
29/05/2024	Dusk Emergence and NBW	21:41	21:26 – 23:41	Dry, light breeze	13°C - 11°C
25/06/2024	Dusk Emergence and NBW	21:58	21:43 – 23:58	Dry, light breeze	17°C - 15°C
<b>2025 Surveys</b>					
13/05/25	Dusk NBW	21:17	21:17 – 23:17	Dry, no breeze	14°C - 12°C
22/05/2025	Dusk Emergence and NBW	21:32	21:25 – 23:35	Dry, no breeze	16°C - 13°C
16/06/2025	Dusk Emergence and NBW	21:55	21:40 – 23:55	Dry, gentle breeze	16°C - 15°C

## 2.4 Evaluation of the Importance of the Site for Bat Species

The value of the importance of the Site for bat species was evaluated using the ecological evaluation guidance given in the National Roads Authority ('NRA') guidance on assessment of ecological impacts of National Road Schemes [9]. This guidance provides ratings for resources based primarily on geographic context and allows for resources at the following levels:

- International Importance;
- National Importance;
- County Importance (or vice-county in the case of plant or insect species);
- Local Importance (Higher Value); and,
- Local Importance (Lower Value).

## 3 RESULTS

### 3.1 Desk-Based Results

Prior to conducting the field surveys, a desk-based review of information sources was completed.

Three of the nine resident bat species found in Ireland, soprano pipistrelle, common pipistrelle and Daubenton's bat, have been recorded within a 2km radius of the Proposed Development within the past 10 years [4].

Table 3-1 provides details of the habitat suitability index for the Site [4]. The habitat suitability index identifies the geographical areas that are suitable for individual species. The index ranges from 0 to 100, with 100 being the most favourable to bats. The index presented is for all species combined, in addition to the individual species indices within the Site.

From the indices, it can be established that the study area has an overall moderate habitat suitability index range of 21-28. The habitat suitability for Irish bats within the area ranges from very low to high. Excluding the lesser horseshoe bat and Nathusius' pipistrelle which have 'very low' habitat suitability for the Site, all of the other listed species are likely to occur within the area.

**Table 3-1: Habitat Suitability Index**

Bat Species	Suitability Index Range	Suitability Index Level
All Bat Species	21-28	Moderate
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	39-45	High
Brown Long-eared Bat ( <i>Plecotus auratus</i> )	29-38	Moderate
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	31-38	Moderate
Lesser Horseshoe Bat ( <i>Rhinolophus hipposideros</i> )	0-4	Very Low
Whiskered Bat ( <i>Myotis mystacinus</i> )	21-31	Moderate
Daubenton's Bat ( <i>Myotis daubentonii</i> )	22-29	Moderate
Leisler's bat ( <i>Nyctalus leisleri</i> )	30-37	Moderate
Nathusius' Pipistrelle ( <i>Pipistrellus nathusii</i> )	0-5	Very Low
Natterer's Bat ( <i>Myotis nattereri</i> )	27-36	Moderate

### 3.2 Field Based Results

Multiple trees onsite were identified as having the potential to support roosting bats. Additionally, the abandoned farmhouse was identified as having roost potential. The hedgerows and treelines that border the Site and the access track within the site were identified as providing suitable foraging and commuting habitats for bats.

#### 3.2.1 External Building Inspection

The external building inspection identified suitable features for roosting bats within one building onsite. This building had loose roof tiles and holes within the roof structure that could

provide suitable emergence / re-entry points into the roof for roosting bats (see Plate 3-1 below).

**Plate 3-1: Building onsite with features suitable for roosting bats**



However, there was no visual evidence that bats were using these potential access points, such as droppings on the building walls or urine splashes / fur-oil staining.

### 3.2.2 Tree Inspection

The tree inspection survey concluded that three trees within the Site had features suitable for roosting bats. This conclusion was based on the presence of dense, woody ivy growing on mature trees. These trees were surveyed for bat emergence along the existing access road into the Site; these trees will be retained and protected as part of the Proposed Development.

### 3.2.3 Bat Survey Results

The surveyors identified bats foraging and commuting along the hedgerow and treelines adjacent to the access track within the Site and along the north, east and southern Site boundaries. Bats were also recorded foraging and commuting within the farmyard and around the abandoned farmhouse.

Between low and high levels of bat activity were recorded throughout the bat surveys undertaken at the Site.

The following bats were recorded as a result of the bat surveys undertaken at the Site in 2023 and 2024:

- Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, and *Myotis* species were recorded foraging and commuting within the survey area. The most frequently encountered species of these were common pipistrelle, followed by soprano pipistrelle and Leisler's bat. Low levels of brown long-eared bat and *Myotis* species were recorded during the bat surveys;
- No bats were identified to be roosting within the buildings or trees in the Site; and,

- Common pipistrelle, soprano pipistrelle and Leisler's bat were recorded shortly after dusk during the bat surveys. This indicates that bat roosts for these species are likely to be present within the vicinity of the Site.

#### 3.2.3.1 2023 Dusk Emergence and Transect Surveys

##### 13/09/2023

Sunset was at 19:57.

##### VP1/T1

No bats were recorded at VP1/T1.

##### VP2/T3

Only one bat calls was recorded at VP2/T3 – a common pipistrelle at 20:10.

##### VP3/T2

No bats were observed at VP3/T2 and very low bat activity was recorded. Leisler's bat had ca. two passes per hour, common pipistrelle had ca. two passes per hour and *Myotis* species had ca. one pass per hour.

##### 26/09/2023

Sunset was at 19:24.

##### VP1/T3

The first bat recorded at VP1 was a common pipistrelle commuting over the Site at 19:45. Soprano pipistrelle and common pipistrelle were recorded foraging and commuting over the Site for the remainder of the emergence survey. The same species were recorded during the transect survey, as well as Leisler's bat. Bats were recorded foraging and commuting over the hedgerow / treelines in the northeast and southeast of the Site. The last bat was recorded at 21:18.

Overall, there was moderate bat activity recorded at VP1/T3, with ca. 32 bat passes recorded per hour. Common pipistrelle had ca. 26 passes per hour, soprano pipistrelle had ca. three passes per hour and Leisler's bat had ca. three passes per hour.

##### VP2

The first bat recorded at VP2 was a Leisler's bat at 19:36, but not observed by the surveyor. Shortly afterwards at 19:39 a Leisler's bat was observed commuting south. A Leisler's bat was also observed constantly foraging over the grassland around VP2 from 19:39 – 19:43. Common pipistrelle were also recorded during the emergence survey, but not observed.

Activity was higher during the transect survey, and common pipistrelle were observed foraging over the vegetation to the south of the buildings onsite. Soprano pipistrelle calls were also recorded, but not observed. The last bat recorded was at 21:23.

Overall, there was low bat activity recorded at VP2/T3, with ca. eight bat passes recorded per hour. Common pipistrelle had ca. five passes per hour, Leisler's bat had ca. two passes per hour and soprano pipistrelle had ca. one pass per hour.

##### VP3/T2

The first bat recorded at VP3 was a Leisler's bat at 19:43 but not observed by the surveyor. Shortly afterwards at 19:48 a common pipistrelle was observed commuting south over the building onsite. Common pipistrelle and soprano pipistrelle were observed commuting over the buildings and foraging in front of the vegetation by the building. Leisler's bat and brown long-eared bat calls were recorded but not observed by the surveyor.

During the transect survey, soprano pipistrelle was observed foraging over the hedgerow / treeline along the northern Site boundary. Common pipistrelle and brown long-eared bat calls were also recorded but not observed by the surveyor. The last bat recorded was at 21:14.

Overall, there was moderate bat activity recorded at VP3/T2, with ca. 41 bat passes recorded per hour. Common pipistrelle had ca. 19 passes per hour, soprano pipistrelle had ca. 11 passes per hour, Leisler's bat had ca. seven passes per hour, and brown long-eared bat had ca. four passes per hour.

### 3.2.3.2 2024 Dusk Emergence and NBW Surveys

#### 29/05/2024

Sunset was at 21:41.

##### VP1/T1

The first bat recorded and observed at VP1 was a Leisler's bat at 21:55, seen commuting from the west over the farmyard onsite. Shortly afterwards at 22:22 two Leisler's bat were observed foraging over a similar area over the farmyard. A Leisler's bat was also recorded foraging over the vegetation to the east of the vantage point. Common pipistrelle calls were also recorded during the emergence survey, but these bats were not observed by the surveyor. Similarly, a singular call from a *Myotis* species was recorded at 22:38 but not observed by the surveyor.

Similar levels of bat activity were recorded during the NBW survey, with bats recorded predominantly foraging over the boundary hedgerow / treelines. Common pipistrelle, Leisler's bat and brown long-eared bat were recorded during the transect survey. The last bat recorded was at 23:32.

Overall, there was moderate bat activity recorded at VP1/T1, with ca. 27 bat passes recorded per hour. Common pipistrelle had ca. 13 passes per hour, Leisler's bat had ca. 12 passes per hour, brown long-eared bat had ca. one pass per hour and *Myotis* species had ca. one pass per hour.

##### VP2/T3

The first bat recorded and observed at VP2 was a soprano pipistrelle at 21:50, commuting east over the VP. At 21:55 a Leisler's bat was observed commuting south over the VP. Bats were observed constantly foraging and commuting over the grassland around the VP, as well as commuting over the hedgerow / treelines in the surrounding area. Leisler's bat, common pipistrelle and brown long-eared bat were recorded.

Activity was much lower during the NBW survey, and common pipistrelle, soprano pipistrelle, brown long-eared bat and *Myotis* species were recorded when the surveyor was walking the transect along the boundary hedgerow / treelines. The last bat recorded was at 23:24.

Overall, there was moderate bat activity at VP2/T3, with ca. 41 bat passes recorded per hour. Common pipistrelle had ca. 29 passes per hour, Leisler's bat had ca. nine passes per hour, soprano pipistrelle had ca. one pass per hour, brown long-eared bat had ca. one pass per hour and *Myotis* species had ca. one pass per hour.

##### VP3/T2

The first bat recorded at VP3 was a Leisler's bat at 21:55 but not observed. From 21:56 – 21:58 a soprano pipistrelle was observed foraging in front of the east of the house. Shortly afterwards from 22:07 – 22:10 a common pipistrelle was observed foraging and commuting around the same area in front of the house onsite. These were the only three species recorded during the emergence survey.

Activity levels were similar during the NBW survey and bats were recorded foraging and commuting along the boundary hedgerow / treelines. The last bat recorded was at 23:32.

Overall, there was moderate bat activity at VP3/T2, with ca 42 bat passes recorded per hour. Common pipistrelle had ca. 22 passes per hour, Leisler's bat had ca. 10 passes per hour, soprano pipistrelle had ca. eight passes per hour, brown long-eared bat had ca. one pass per hour and *Myotis* species had ca. one pass per hour.

#### 25/06/2024

Sunset was at 21:58.

##### VP1/T1

The first bat recorded at VP1 was a Leisler's bat at 22:16, but not observed by the surveyor. The first bat observed was a soprano pipistrelle at 22:28, seen commuting over the building onsite. Two bats were then seen commuting around the same area over the building, and the recordings at this time recorded bat calls from soprano pipistrelle and Leisler's bat. A Leisler's bat was seen constantly foraging over the surveyor at VP3 to the south of the building from 22:32 – 22:42. At 22:37 one bat was seen commuting east over the building, and shortly afterwards at 22:39 a bat was observed commuting south over the building. The recordings at this time recorded calls from common pipistrelle, Leisler's bat and brown long-eared bat, so it is likely that the bats observed were a combination of these species. A common pipistrelle was observed constantly foraging over the vegetation / grassland to the north of the building from 22:44 – 22:58.

Activity was also high during the NBW survey, with bats recorded foraging and commuting over the hedgerow / treelines along T1. Common pipistrelle, Leisler's bat and brown long-eared bat were recorded during the transect survey. Common pipistrelle were the most frequently recorded species, and two bats were often seen foraging together. The last bat was recorded at 23:32.

Overall, there was moderate bat activity at VP1/T1, with ca. 38 bat passes recorded per hour. Common pipistrelle had ca. 25 passes per hour, Leisler's bat had ca. 10 passes per hour, brown long-eared bat had ca. two passes per hour and soprano pipistrelle had ca. one pass per hour.

##### VP2/T3

The first bat recorded and observed at VP2 was a common pipistrelle at 22:15, commuting north and south over the hedgerow surveyed. Bats were observed constantly commuting back and forth over this hedgerow for the remainder of the emergence survey. Common pipistrelle were the most frequently recorded bat species, but soprano pipistrelle, Leisler's bat and brown long-eared bat were also recorded.

Similar levels of bat activity were recorded during the NBW survey. Common pipistrelle and soprano pipistrelle were observed commuting east along the treeline in the south of the Site, as well as foraging over the grassland and boundary hedgerow / treelines onsite. The last bat recorded was at 23:58.

Overall, there was high bat activity at VP2/T3, with ca. 75 bat passes recorded per hour. Common pipistrelle had ca. 45 passes per hour, Leisler's bat had ca. 14 passes per hour, soprano pipistrelle had ca. 13 passes per hour and brown long-eared bat had ca. three passes per hour.

##### VP3/T2

The first bat recorded and observed at VP3 was a Leisler's bat at 22:16, seen foraging over the grassland to the west of the VP. Shortly afterwards at 22:23 a common pipistrelle was also observed foraging over the grassland slightly further west of the VP. Bats were observed constantly foraging over the grassland to the west of VP3, and occasionally commuting over

the hedgerow / treeline. Common pipistrelle, soprano pipistrelle, Leisler's bat and brown long-eared bat were recorded during the emergence survey.

Activity was lower during the NBW survey, but bats were recorded commuting along the hedgerow / treelines along T3. Common pipistrelle, Leisler's bat and brown long-eared bat were recorded, and the last bat was recorded at 23:32.

Overall, there was moderate bat activity at VP3/T2, with ca. 40 bats recorded per hour. Common pipistrelle had ca. 25 passes per hour, Leisler's bat had ca. 11 passes per hour, brown long-eared bat had ca. two passes per hour and soprano pipistrelle had ca. two passes per hour.

**Figure 3-1: Bat Activity within the Site (2023 & 2024)**



### 3.2.3.3 2025 Dusk Emergence and NBW Surveys

13/05/2025

Sunset was at 21:17.

#### T1

The first bat recorded at T1 was a Leisler's bat at 21:34. This bat was observed when the surveyor was stationary and was seen commuting southwest over the hedgerow / treeline in the centre of the Site (Figure 3-2). One common pipistrelle was observed foraging and passing over the surveyor multiple times from 21:47 – 21:55 over the hedgerow / treeline in the centre of the Site (Figure 3-2). A Leisler's bat was recorded passing multiple times from 21:56 – 22:01, but not observed by the surveyor. From 22:04 – 22:17 the surveyor observed one common pipistrelle and one Leisler's bat foraging and commuting over the hedgerow / treeline in the centre of the Site (Figure 3-2).

During the walked transect at T1, a soprano pipistrelle was recorded at 22:23 when the surveyor was walking along the central hedgerow / treeline (SP, Figure 3-2), but not observed by the surveyor. A common pipistrelle (CP, Figure 3-2) was recorded at 22:40, 22:47, and 22:52 along various areas of T1, but not observed by the surveyor. Calls from both soprano pipistrelle and Leisler's bat (LB, Figure 3-2) were recorded at 22:57 when the surveyor was walking the transect to the east of the central hedgerow, but no bats were observed. Common pipistrelle were recorded at 23:04, 23:13 and 23:16 but not observed by the surveyor.

Overall, there was high activity recorded at T1, with ca. 47 bat passes recorded per hour. Common pipistrelle had ca. 27 passes per hour, Leisler's bat had ca. seven passes per hour and soprano pipistrelle had ca. three passes per hour.

#### T2

No bats were observed by the surveyor during the NBW at T2. The first bat recorded during the stationary period of the NBW was a common pipistrelle at 21:44. Leisler's bat were recorded shortly afterwards at 21:46 passing four times. Leisler's bat and common pipistrelle were recorded infrequently for the remainder of the stationary period of the NBW.

During the transect portion of the survey, Leisler's bat (LB, Figure 3-2) were recorded at 22:20, 22:22 and 22:34 along the northern and eastern hedgerow / treelines. Common pipistrelle were recorded consistently from 22:19 – 22:45 (CP, Figure 3-2), and once towards end of the survey at 23:02. Soprano pipistrelle (SP, Figure 3-2) was recorded twice during the NBW – at 22:49 and 22:57.

Overall, there was moderate activity recorded at T2 with ca. 22 bat passes recorded per hour. Common pipistrelle had ca. 14 passes per hour, Leisler's bat had ca. seven passes per hour, and soprano pipistrelle had ca. two passes per hour.

#### T3

The first bat observed during the stationary period of the NBW was recorded at 21:41. No bat species was picked up by the bat detector, but the surveyor saw this bat foraging over the hedgerow / treeline to the east of the Site. The next bat recorded was a common pipistrelle at 22:01, but not observed by the surveyor. Leisler's bat were also recorded at 22:06, 22:14 and 22:16, but not observed by the surveyor.

During the transect portion of the NBW common pipistrelle (CP, Figure 3-2) and Leisler's bat (LB, Figure 3-2) were recorded frequently when the surveyor was walking the transect. Of these recordings, one common pipistrelle was observed foraging over the hedgerow / treeline in the south of the Site at 22:50. A common pipistrelle was also observed commuting northwest over a hedgerow / treeline in the south of the Site at 23:00. One soprano pipistrelle call was recorded at 23:05 when the surveyor was walking along the hedgerow / treeline in the north of the Site.

Overall, there was moderate activity recorded at T3 with ca. 24 bat passes recorded per hour. Common pipistrelle had ca. 15 passes per hour, Leisler's bat had ca. eight passes per hour, and soprano pipistrelle had ca. one pass per hour.

Figure 3-2: Results from NBW Survey on 13/05/2025



#### 22/05/2025

Sunset was at 21:32.

#### VP1/T1

It should be noted that the surveyor observed that the road adjacent to VP1/T1 was very noisy and loud with cars passing almost constantly throughout the survey.

The first bat recorded was a common pipistrelle at 22:06, but observed by the surveyor. Common pipistrelle and Leisler's bat were also recorded from 22:10 – 22:15, but not observed by the surveyor. The first bat observed at VP1 was a Leisler's bat at 22:17, observed foraging over the grassland to the west of the VP. Directly afterwards at 22:18 a common pipistrelle was observed commuting over the laneway towards the west outside of the Site boundary. The next bats observed were three soprano pipistrelle at 22:22, seen foraging over the road to the east of the VP. From 22:22 – 22:26 multiple Leisler's bat and common pipistrelle passes were recorded but not observed by the surveyor. From 22:27 – 22:32, the end of the emergence survey, one common pipistrelle was observed constantly foraging and commuting over the grassland to the west of VP1. A Leisler's bat was also present foraging and commuting in this area from 22:30.

The first bat recorded along T1 during the NBW survey was a common pipistrelle and Leisler's bat at 22:36, observed foraging in the same area as described above to the east of VP1. Common pipistrelle were recorded infrequently throughout the NBW and the last bat was recorded at 23:33. Leisler's bat were also recorded throughout the NBW, but the only bat observed was at 23:08 and seen commuting over the road to the west of the Site.

Overall, there was high bat activity at VP1/T1, with ca. 44 bat passes recorded per hour. Leisler's bat had ca. 22 passes per hour, common pipistrelle had ca. 21 passes per hour, and soprano pipistrelle had ca. one pass per hour. No bats were roosting within the lodge building.

#### VP2/T2

It should be noted that the surveyor observed that the road adjacent to VP1/T1 was very noisy and loud with cars passing almost constantly throughout the survey.

No bats were observed by the surveyor at VP2, but Leisler's bat and common pipistrelle were recorded infrequently from 22:16 – 22:32.

During the NBW survey, common pipistrelle and Leisler's bat were frequently recorded when the surveyor was walking along all areas of T2. The last bat recorded was at 23:30.

Overall, there was moderate bat activity at VP2/T2, with ca. 20 bat passes recorded per hour. Leisler's bat had ca. 12 passes per hour and common pipistrelle had ca. eight passes per hour. No bats were roosting within the lodge building.

#### 16/06/2025

Sunset was at 21:40

The full analysis of this data was not complete at the time of writing this report. However, a high-level review of this data did not identify any bat species emerging from the Lodge building. Once this analysis and reporting is complete, it will be submitted to Cork City Council.

#### **3.2.3.4 Static Monitoring (SM4)**

The analysis and reporting associated with the Static Monitoring undertaken in 2025 are ongoing and following the completion of analysis, the survey data will be provided to the Cork City Council.

#### **3.3 Overall Results**

The following bats were recorded as a result of the bat surveys undertaken at the Site:

- Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, and *Myotis* species were recorded commuting / foraging within or above the Site;
- Bats were recorded within 15 minutes of sunset, indicating the presence of bat roosts close to the Site, and,
- No bats were identified to be roosting within the buildings or trees onsite.

Based on the levels of activity and movement of the bats recorded during the surveys, it is considered that the Site is of no value to roosting bats and high local value to foraging / commuting bats.

## 4 IMPACT ASSESSMENT AND MITIGATION

The following bat species have been recorded during the dusk emergence and activity surveys: common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* species. Taking a precautionary approach and assuming that the *Myotis* species bat calls were recorded from all three resident *Myotis* bat species found in Ireland (Daubenton's bat, Natterer's bat and whiskered bat), this represents seven of the nine resident bat species found in Ireland. Nathusius' pipistrelle and the lesser horseshoe bat were the only resident bat species not recorded onsite. All bat species recorded during the bat surveys are Annex IV species under the EU Habitats Directive, and all have a favourable status in Ireland.

Bat species within the Site have the potential to be affected by both the Construction and Operational Phases of the Proposed Development. The impact assessment and mitigation will be undertaken in relation to the seven bat species recorded within the Site.

### 4.1 Potential Impacts on Bats

The Proposed Development will result in ground clearance works, the installation of lighting, the construction of houses and apartment blocks and all associated works.

Principal impacts of the Proposed Development, in general, on bat fauna may be summarised as follows:

#### 4.1.1 Loss of Habitat / Disturbance

The surveys did not identify any bat roosts within the survey area or the trees to be removed as part of the Proposed Development.

Bats were observed foraging over the areas of improved agricultural grassland and commuting along the hedgerow / treelines, particularly in the central laneway of the Site. Mitigation measures are therefore required to ensure bats will be able to continue to use the Site for foraging and commuting.

The hedgerow / treeline on the access track to the farmyard and around the orchard which had the most activity will be retained and protected for the lifetime of the Proposed Development. Small sections of hedgerow / treeline will be removed to facilitate the Proposed Development, however, these sections are short and will not significantly fragment the linear features. The areas of agricultural grassland will be lost as ground clearance works and construction of buildings will take place as a result of the Proposed Development. However, supplementary planting will be implemented, see Landscape Design Report outlined in Section 4.2.1 below. Subject to the implementation of an appropriate lighting plan, bats will continue to be able to use the hedgerow / treeline for foraging and commuting.

#### 4.1.2 Lighting of the General Area (street lighting, security lighting etc.)

Lighting for the Proposed Development will potentially impact on bat species in relation to commuting and foraging potential onsite. The degree of this impact is dependent on the sensitivity of the bat species, as some bats are more tolerant of lighting. Pipistrelles will tolerate low levels of lighting, while brown long eared bats and *Myotis* species are very sensitive to lighting and require the light levels to be below 1lux. It should be noted that the N22 road adjacent to the southern boundary of the Site has street lights along it and light from cars driving spills into the Site, particularly in the eastern section of the Site due to the incline of the field.

As *Myotis* species and brown long eared bats were recorded within the survey area, it is important to ensure that lighting is directional and that there are buffer zones or screen plantings established to reduce light spillage onto the retained hedgerow / treelines.

In the absence of an appropriate lighting scheme, it is considered that the Proposed Development could have a Negative Impact on foraging and commuting bats.

### 4.2 Mitigation Measures

The following mitigation measures are recommended to reduce the potential impact of the Proposed Development on local bat populations.

#### 4.2.1 Landscaping Plan

A Landscape Design Report and drawings has been prepared by Brady Shipman Martin and outlines the proposed planting and locations. Please refer to the Landscape Design Report submitted as part of the overall application.

Based on the proposed Landscape Design Report that will be submitted, the plan comprises of proposed tree planting, woodland native riparian planting along the River, native woodland planting, screen native hedgerow / scrub planting, hedge planting, shrub planting, perennial planting, climber planting along walls and meadow planting. Bats will be able to use the areas in the Landscape Plan for foraging purposes.

The following landscape recommendations are also advised:

- Avoid the use of herbicides and chemicals (weed killers, etc.) within the development zone where possible;
- Where possible, the trees which are to be removed, should be felled on mild days during the autumn months of October – November or during spring months of February-March (felling during the spring or autumn avoids the periods when bats are most active).

#### 4.2.2 Lighting Plan

Bats are adverse to excessive lighting, subsequently, impacts could occur as a result of an inappropriate lighting strategy.

An external Outdoor Lighting Report has been prepared by Kelliher's Electrical and submitted as part of the overall planning application. 228 lighting bollards will be erected onsite. However, all lighting will be directional and downward-facing to prevent light spillage onto non-targeted areas.

In the western part of the Site, the illuminance levels (lux)(lx) have been calculated as follows:

- Average illuminance: 8.43lx;
- Minimum illuminance: 1.71lx; and,
- Maximum illuminance: 19.17lx.

In the central part of the Site, the illuminance levels have been calculated as follows:

- Average illuminance: 7.85lx;
- Minimum illuminance: 1.67lx; and,
- Maximum illuminance: 16.00lx.

In the eastern part of the Site, the illuminance levels have been calculated as follows:

- Average illuminance: 8.22lx;
- Minimum illuminance: 1.89lx; and,
- Maximum illuminance: 17.22lx.

The lighting plan has been designed to avoid light spillage onto retained hedgerow / treelines where possible. It has been designed to avoid light spillage onto the proposed floral meadows and native woodland riparian planting in the east of the Site which will provide suitable foraging and commuting habitat for bats.

In addition, the lighting proposed as part of the Proposed Development, will include the following measures:

- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting should be turned down / off when not required;
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only where it is needed; and,
- The height of lighting columns should be reduced as much as possible, as lighting at a low level further reduces ecological impact.

The following measures should be taken into consideration during the construction phase of the Proposed Development:

- Construction should be limited to daylight hours in order to minimise adverse effects on nocturnal fauna;
- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting should be turned down / off when not required;
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only where it is needed; and,
- The height of lighting columns should be reduced as much as possible, as lighting at a low level further reduces ecological impact.

#### 4.2.3 Protection for Trees, Hedgerows and Treelines

A Tree Report was prepared by BSM. The following mitigation measures will be followed to ensure no adverse impacts to the retained hedgerow / treelines onsite. These mitigation measures are outlined in the Tree Report submitted as part of the planning application.

- Sturdy tree protection fencing will be erected by Main Contractor prior to any construction works commencing on site, and will not be removed or moved unless authorised by a qualified arborist;
- Where site machinery has to encroach the RPAs of the trees to be retained for reasons unforeseen and unavoidable; suitable ground protection will be put in place to prevent any significant soil compaction or root damage near the trees; this should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight;
- Any new underground services such as electricity cables, water pipes etc. will be routed away from the root protection areas of the trees to be retained; where this is

not possible for reasons unforeseen, the services will be installed using specialist methodology (such as Airspace excavation or Mole drilling) that ensures minimal impact on any tree roots;

- The tree protection measures, and specialist work methods will be overseen by a qualified arborist; the arborist should also make regular visits to the site during the construction process to ensure compliance and be available to provide advice and guidance where necessary; and,
- The retained trees should be assessed by a qualified arborist following the completion of the construction works.

#### 4.2.4 Provision of artificial roosting sites

Given the high levels of activity recorded during the onsite surveys, it is proposed to install artificial bat boxes within the Site.

Artificial bat boxes will also be erected on suitable mature trees within the Site. Artificial bat boxes can provide vital roosting places in habitats devoid of natural roosting opportunities. Bat boxes can also provide additional suitable roosting habitats for bats in an area.

Bat boxes should be placed in a position sheltered from strong wind and exposed to the sun for part of the day. The boxes will be located in / close to linear features, such as the treelines and placed a minimum of 2m above the ground. The number and location of which will be specified by an ecologist. Plate 3-2 below shows suitable bat roost box examples including a Pole Mounted Bat Box, Bat Box Schwegler 1FF and Vivara Small Bat Box.

The exact location of the bat boxes will be determined by an experienced ecologist after the completion of the construction phase of the Proposed Development. This is to allow the ecologist to assess the exact conditions that have been created and thus to ensure that the bat boxes are sited in the most appropriate location possible.

Plate 3-2: Suitable Bat Boxes



#### 4.2.5 Monitoring

In order to ensure that the works in relation to the Proposed Development do not have significant impacts on bats, the following construction procedures and mitigation measures will be implemented as part of the proposed works. These measures are in line with the NRA (now TII) Guidance for Bats:

- An updated building inspection will be required prior to the upgrade of the buildings onsite as bats may have begun to roost within these buildings since the 2024 and

2025 surveys. If deemed necessary updated emergence surveys will be required to confirm the presence / absence of roosting bats within the buildings;

- If bats were found to be roosting within the buildings, further measures may need to be considered in order to protect bats against any disturbance. The NPWS will be consulted for advice and a derogation licence will be obtained if required;
- Following the installation of the culverts, static monitors will be deployed during the spring, summer and autumn periods to monitor the use of the culverts by bat species; and,
- Following the installation of the lighting for the Proposed Development, a suitably qualified Ecologist should undertake a further Site inspection in order to check the lighting patterns and lux levels along the Site boundaries.

## 5 CONCLUSIONS

The bat surveys undertaken for the Proposed Development included a walkover of the lands within the survey area, ground-level tree inspection, external building inspection, and dusk emergence survey and activity surveys across 2023, 2024 and 2025. The walkover identified two building (Maglin House and the Lodge building) and three trees with features suitable for roosting bats. No bats were identified to be roosting within the building or trees on-site. It is considered that no derogation licence is required to facilitate the Proposed Development.

It was concluded that the Site is of low value to roosting bats and high local value to foraging and commuting bats. Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, and *Myotis* species were recorded during the bat surveys onsite. Bats were predominantly recorded foraging and commuting over Maglin House onsite, and over the hedgerow / treelines that border and traverse the Site.

The Proposed Development will result in some loss of commuting / foraging habitats for bats by the partial removal of the hedgerow / treelines and agricultural fields. However, the landscape plan has been designed to retain the majority of the features that support bat commuting / foraging activity within the Site. New plantings and enhancement plantings will also ensure connectivity to remain at existing levels.

Overall, the survey area is considered to be of high local value for commuting and foraging bats within the local area as the majority of the Site is dark at night and contains good commuting and foraging habitats for bats. However, the majority of the linear features within the Site will be retained and it is considered that if the mitigation measures presented within this report are followed, the potential impacts on bats will be reduced and the overall impact from the Proposed Development on bats will be Low-Negligible.

## 6 REFERENCES

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- [2] J. Collins, "Bat Surveys for Professional Ecologists - Good Practice Guidelines (4th ed.)," The Bat Conservation Trust, London, 2023.
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**APPENDIX 11-2 Bird Report**

**Bird Report**

**Proposed Large-Scale Residential  
Development  
at  
Maglin, Ballincollig, Co. Cork**

On behalf of  
**O'Flynn Construction Co. Unlimited  
Company**



MALONE O'REGAN

**Form ES - 04**



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**Approved By: Amelia Keane**

**Signed:** Amelia Keane

**Revision Record**

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	08/07/25	Bird Report	Final	AC	HT	AK

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**Bird Report**  
**Proposed Large-Scale Residential Development**  
**O'Flynn Construction Co. Unlimited Company**  
**Maglin, Ballincollig, Co. Cork**

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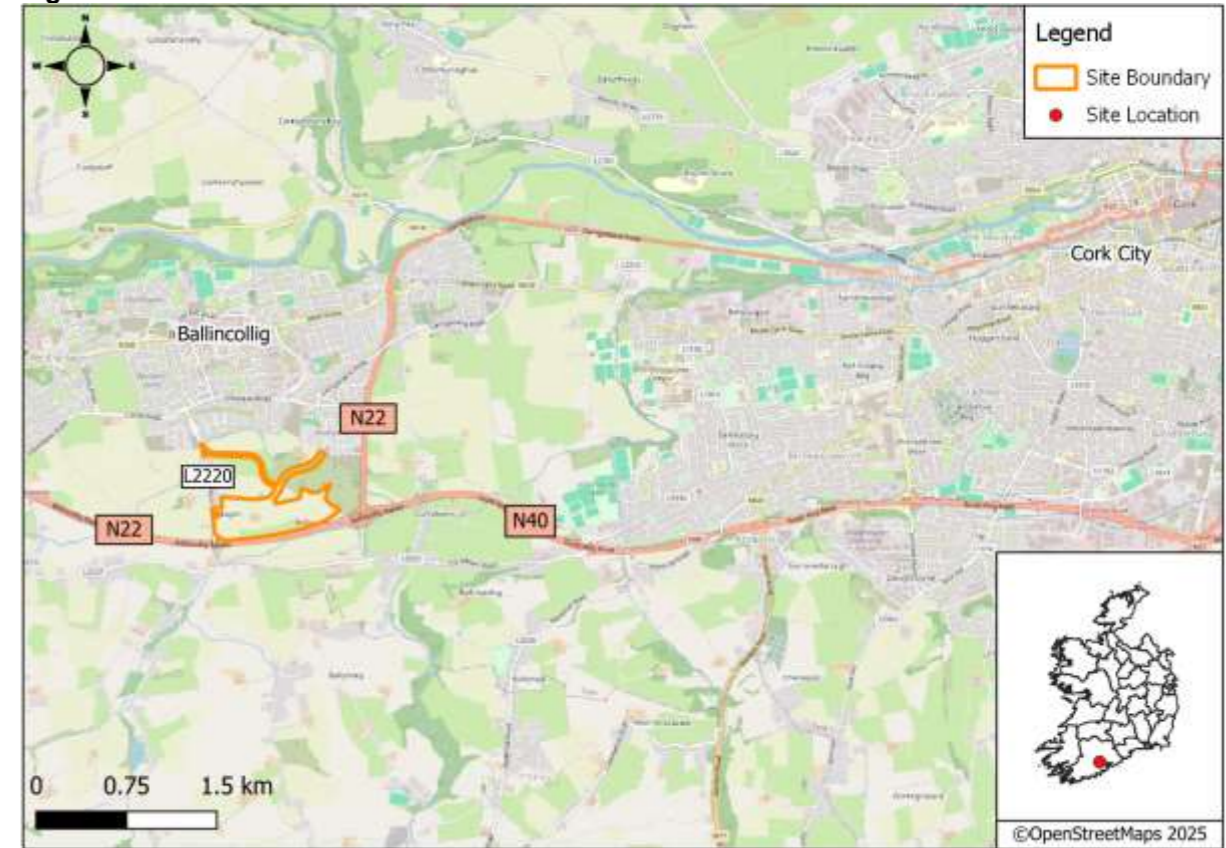
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# 1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') has been commissioned by O'Flynn Group ('the Applicant') to undertake breeding and wintering bird surveys in respect of a proposed Large-Scale Residential Development ('LRD') and all ancillary works ('the Proposed Development') at Maglin, Co. Cork (OS ITM Reference: X: 559844 Y: 569377).

The Proposed Development is located on a site within the townlands of Maglin, Ballincollig, Carrigrohane and Ballynora, Co. Cork ('the Site'). The Site is located circa ('ca.') 870m south of Ballincollig Town Centre and ca. 7.2km southwest of Cork City Centre and is shown in Figure 1-1.

**Figure 1-1: Site Location**



## 1.1 Site Context

The Site has a relatively flat topography with some sloped areas along the southern and eastern boundaries. The Site is currently accessed via L2220 ('Maglin Road') to the west, with ca. 170m of the land fronting onto Maglin Road.

The lands comprise agricultural fields. Maglin House, a late 18<sup>th</sup> / early 19<sup>th</sup>-century house, sits centrally within the lands. The two-storey, L-shaped farmhouse is currently surrounded by a farmyard with associated farm buildings located to the rear of the house and an overgrown orchard to the south. The primary field boundaries are made up of hedgerow / treelines that border the Site to the north, south, east and west, and bisect the fields. The Grange Hill River intersects the northwestern and northeastern portions of the Site and borders the northeastern boundary of the Site.

A small area of mixed broadleaved woodland lies adjacent to the Grange Hill River on the southeastern branch of the Site and lies adjacent to Maglin Road on the northwestern branch of the Site.

The Site is primarily surrounded by agricultural land. The town of Ballincollig is located generally to the north of the Site. The N22 National Road runs adjacent to the southern boundary of the Site, which connects the lands to Cork City's environs and major employment hubs. Residential properties are located on the northwestern Site boundary. The area to the east of the Site is dominated by wet grassland with a construction site for a residential housing development to the northeast.

Figure 1-2: Site Context



## 1.2 Relevant Legislation

All wild birds are protected by law under the Wildlife Act 1976 and subsequent amendments. All species are afforded full protection under this Act, which makes it a criminal offence for anyone without a licence to:

- Kill or injure a wild bird;
- Disturb, damage or remove a wild bird nest or eggs; and,
- Disturb any wild bird while at the nest.

In addition to domestic legislation birds are also protected under the EU Birds Directive (2009/147/EC). The Birds Directive provides for a network of sites to protect birds at their breeding, feeding, roosting and wintering areas.

For the purposes of this report, a species was considered to be of 'conservation concern' should it be included in one or more of the following:

- Annex 1 of the EU Birds Directive;
- Part 1 of the Fourth Schedule of the Wildlife Act, 1976 (as amended);
- Birds of Conservation Concern in Ireland ('BoCCI') red list; and,

- BoCCI amber list.

## 1.3 Objectives

The bird surveys aimed to assess the following:

### Breeding Birds

- To identify and assess the number of active breeding bird territories within the Site;
- To map active nests, where present, within the Site;
- To evaluate the overall bird community within the Site by recording all behavioural activity of birds;
- Utilise the information in order to identify and assess any areas of the Site that may require special consideration during the breeding bird season;
- Assess all potential impacts, if any, of the Proposed Development on breeding bird species; and,
- Provide additional mitigation measures, should they be required.

### Wintering Birds

- To identify, if any, overwintering bird species utilise the Site;
- To determine the potential of overwintering bird species, especially wetland bird species, to utilise the Site as an inland feeding / roosting Site; and,
- To assess all potential impacts, if any, of the Proposed Development on overwintering wetland bird species; and,
- To provide additional mitigation measures, should they be required.

### Barn Owl

- Determine the suitability of the Site for barn owl;
- Determine the use of the Site, if any, by barn owl (e.g., hunting, commuting, roosting);
- To map active nests, where present, within the Site;
- Identify any potential roost sites within the Site;
- Assess all potential impacts, if any, of the Proposed Development on barn owl; and,
- Provide additional mitigation measures, should they be required.

## 1.4 Statement of Authority

This report was reviewed by Mr. Henry Tennyson, Senior Environmental Consultant. Henry is a qualifying member of the Chartered Institute of Ecology and Environmental Management ('CIEEM') with four years of experience working in the environmental consultancy sector. As part of his role, Henry regularly conducts ecological surveys and assessments for various projects across Ireland and has experience in conducting surveys in accordance with Best Practice Guidelines.

This report was approved by Ms. Amelia Keane, Principal Environmental Consultant - Ecology. Amelia Keane has a B.Sc. (Hons) Zoology and an M.Sc. Wildlife Conservation and Management. Amelia is a full member of CIEEM and has over 6 years' experience working in the ecological consultancy with a specialisation in ornithology. Amelia co-authored the publication 'Conservation conflict: Managing forestry versus hen harrier species under Europe's Birds Directive' [1]. As part of her role, Amelia regularly conducts ornithological

surveys for various projects across Ireland and has experience in conducting vantage point surveys, including for receptors such as raptors (specifically hen harrier), owls, geese, swans and waders, etc., wintering and breeding farmland bird transect surveys, ground nesting bird surveys, breeding woodcock surveys, barn swallow surveys, breeding bird habitat suitability assessments, and winter bird habitat suitability assessments. Amelia regularly prepares specialist ornithological assessments and reports.

## 2 METHODOLOGY

The methodologies used to establish the presence / potential presence of breeding birds and wintering birds are summarised below.

### 2.1 Desk-based Studies

A desk-based review of information sources was completed, which included the following sources of information:

- Review of aerial maps of the Site and surrounding area;
- The National Parks and Wildlife Service ('NPWS') website was consulted to obtain the most up-to-date details on conservation objectives for the Natura 2000 sites relevant to this assessment [2];
- Bird Watch Ireland – The Irish Wetland Bird Survey ('I-WeBS') data was reviewed with regard to wintering waterbird population within the vicinity of the Site [3]; and,
- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to species distributions within 2km of the Site [4].

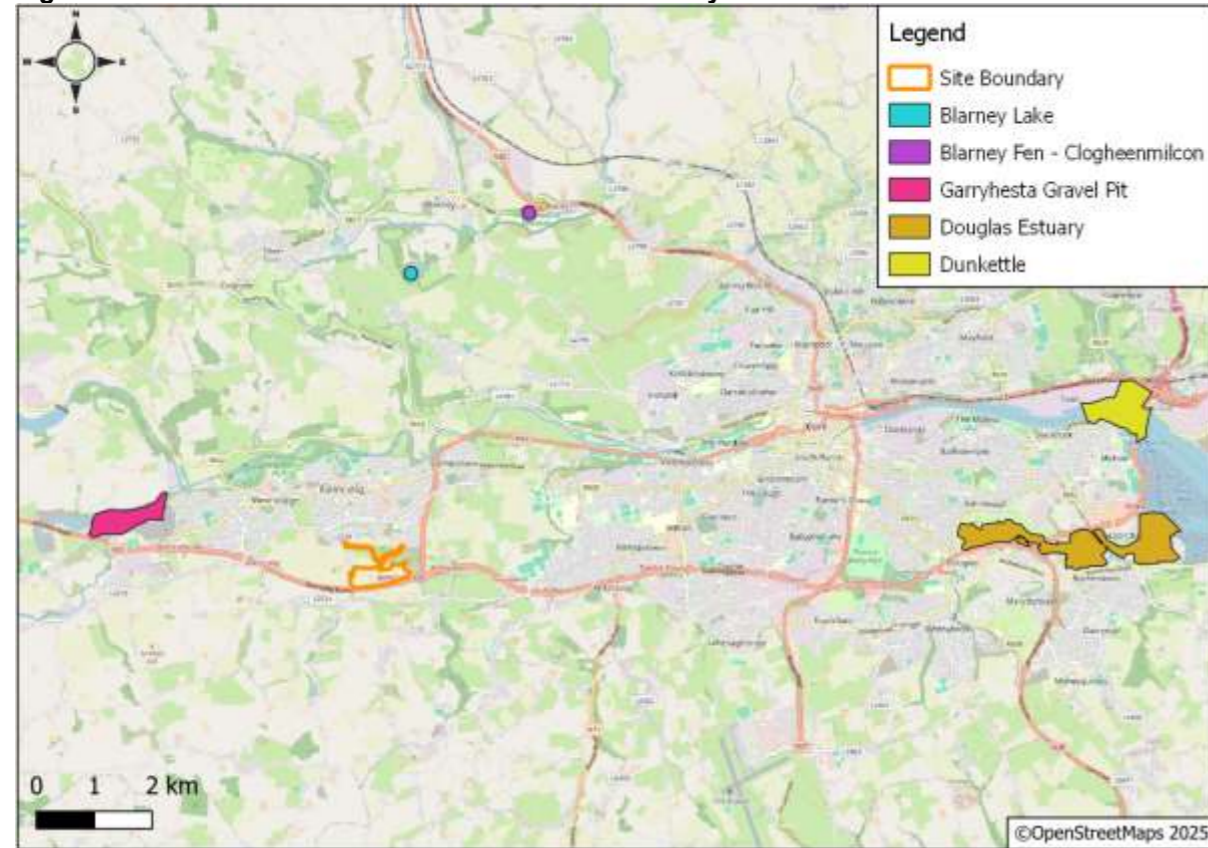
#### 2.1.1 I-WeBS Data Request

As mentioned above, I-WeBS data was reviewed in order to understand the potential assemblages of wintering bird populations that tend to occur within the vicinity of the Site.

As part of this review, a data request was submitted to the I-WeBS on the 7<sup>th</sup> March 2025, which is coordinated by BirdWatch Ireland and under contract to the NPWS. The data request was for all available data from the I-WeBS sites within close proximity to the Site. This included three sites and two subsites, see Figure 2-1:

- Garryhesta Gravel Pit (Site code: 0L202) – located 3.1km northwest of the Site;
- Blarney Lake (Site code: 0L040) – located ca. 4.5km north of the Site;
- Blarney Fen - Clogheenmilcon (Site code: 0L320) – located ca. 6km northeast of the Site;
- Cork Harbour – Douglas Estuary (Site Code: 0L403, Subsite Code: 0L488) – located 9.5km east of the Site; and,
- Cork Harbour – Dunkettle (Site Code: 0L403, Subsite Code: 0L486 – located 12km northeast of the Site.

**Figure 2-1: I-WeBS sites and subsites within the vicinity of the Site**



## 2.2 Field-based Studies

### 2.2.1 Habitat Assessment

An initial site walkover was undertaken on the 31<sup>st</sup> August 2023, by two suitably qualified and experienced MOR Environmental Ecologists, to assess the extent and the quality of habitats present on the Site and to identify any potential ecological receptors associated with any European Designated sites (i.e., Natura 2000 sites).

During the initial site walkover, a habitat survey was undertaken for the Site utilising the Heritage Council's – 'A Guide to Habitats in Ireland' [5]. This is the standard habitat classification system used in Ireland and includes both a desk-based and field-based assessment.

Updated habitat surveys were undertaken on the following dates:

- 13<sup>th</sup> September 2024;
- 25<sup>th</sup> October 2024; and,
- 13<sup>th</sup> May 2025.

These surveys were undertaken by a team of suitably qualified and experienced MOR Environmental Ecologists to confirm that the extent and quality of habitats present onsite and the potential ecological receptors on-site had not changed from the previous assessments.

The assessments were also extended to identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation.

Following the initial Site assessment, it was deemed necessary to undertake specialist breeding bird and wintering bird surveys on-site.

## 2.2.2 Bird Surveys

### 2.2.2.1 Wintering Bird Surveys

Typically, the wintering bird season encompasses mid-September to mid-March. Three wintering bird surveys were undertaken on 21<sup>st</sup> November 2023, 12<sup>th</sup> December 2023 and 17<sup>th</sup> January 2024. These surveys were undertaken to determine whether or not wintering birds were utilising the Site and the area within the immediate vicinity of the Site. Additionally, it was also to assess the potential use of the Site by wintering bird species associated with European sites within 15km of the Site.

The surveys utilised adapted methods from the Scottish Natural Heritage ('SNH') bird survey methods [6] and Bird Monitoring Methods [7]. Two pre-determined vantage points ('VPs') were selected that had sufficient views of the Site (see Figure 2-3). See Figure 2-3 for the viewshed from the VPs. All species observed utilising the Site were recorded, and their locations were marked on the maps. It should be noted that a portion of the fields to the south of the VP were not covered by the viewshed, given the topography of the Site. However, this is not considered a survey limitation due to the fact that these fields are located directly adjacent to the busy N22 National Road and are subject to high levels of traffic noise emissions and regular cattle disturbances. Furthermore, the viewshed from the VPs did have views over the treelines of any birds that would be flying in or out of the fields.

Following the completion of the survey at VP1, a transect survey was undertaken to flush out any birds that may not have been visible during the vantage point survey (see Figure 2-3). The fields in the east of the Site were inaccessible at the time of the surveys due to the presence of livestock, including bulls, see Section 2.2.2.5. During the transect survey, the surveyor walked a set route between VP1 and VP2, and all of the open areas were observed for the presence of birds. Where a flock of birds feeding was encountered, long stops were taken in order to ensure accurate species recording and counting.

During the surveys, all birds were recorded using a standard BTO code through sight and sound and optical equipment, such as telescopes and binoculars, was used to minimise disturbance to wintering birds. The behaviours and activities of the birds were recorded to identify whether the birds were roosting or feeding within the Site. Any roosts identified within the Site were recorded.

The metadata recorded during the surveys is presented in Table 2-1.

**Table 2-1: Metadata for Wintering Bird Surveys**

Visit No.	Date	Time	High Tide	Temperature (°C) (Start – End)	Rain	Cloud Cover	Visibility
1	20/11/2023	09:50 – 13:00	11:21	9°C - 10°C	No rain	80%	100%
2	12/12/2023	09:40 – 12:40	11:10	6°C - 8°C	No rain	90%	80%
3	17/01/2024	09:00 – 12:00	10:30	-1°C – 0°C	No rain	30%	100%

Figure 2-2: Wintering Bird VP and Transect Locations



Figure 2-3: Viewsheds from VPs



### 2.2.2.2 Breeding Bird Surveys

The Site was assessed for its potential to support important assemblages of birds of rare or notable species. Surveys aimed to identify and examine areas where wintering and breeding birds might occur. Any activity and potential nesting habitats onsite were noted.

Three breeding bird transect surveys were undertaken on 24<sup>th</sup> April, 16<sup>th</sup> May and 20<sup>th</sup> June 2024 by two suitably qualified MOR Environmental Ecologists. The breeding bird surveys were conducted in line with the methodology described in:

- British Trust for Ornithology ('BTO') – *A Field Guide to Monitoring Nests* [8]; and,
- Common Bird Census in Bird Monitoring Methods [9].

In order to establish whether any breeding bird species were utilising the habitats onsite or the airspace above the Site, the Common Bird Census ('CBC') methodology was implemented. The transect survey was designed to cover all accessible habitat within and adjacent to the Site and was undertaken by two suitably qualified and experienced MOR Environmental ecologists.

All birds were recorded through sight and sound. Optical equipment was used, such as binoculars, in order to minimise disturbance to potentially breeding birds. The hedgerows, treelines and woodland habitats onsite were examined for the presence of nests. During the survey, the behavioural activity of the recorded birds was noted using the BTO breeding status codes [10]. Birds that displayed non-territorial behaviours were recorded as well (i.e., birds that were flying over the Site, birds that were foraging and not calling, birds that were loafing).

Therefore, birds were classified as non-breeding, possibly breeding and confirmed breeding based on the behaviours exhibited. The criteria for each classification are described below:

- Non-breeding – Birds that were flying over the Site, birds that were foraging and not calling, birds that were loafing;
- Possible Breeding – Birds observed in suitable nesting habitat and displaying either territorial and / or courtship behaviours, nest building behaviours or observed visiting a possible nest; and,
- Confirmed Breeding – Birds observed either on nest or carrying faecal sac or food, sighting of a nest with eggs / chicks, used nests, eggshells or recently fledged young.

The metadata for the breeding bird surveys are described in Table 2-2. The location of the transects is in Figure 2-4. At the time of the surveys, the Site Boundary had not included the most northern section of the Site (the proposed access roads), as the Site Boundary was modified to include these sections following consultation with Cork City Council ('CCC') to include roads accessing the Site. Given the similarity of the habitats in the extended area and similar agricultural practices, it can be assumed that the bird species utilising the area surveyed will be similar to those in the extended area.

Please note that updated breeding bird surveys are taking place in the 2025 survey season, and the results will be submitted to CCC following completion.

Table 2-2: Breeding Bird Survey Metadata

Visit No.	Date	Time	Temperature (°C) Start - End	Wind (Beaufort Scale)	Rain	Cloud Cover
1	24/04/2024	7:40 – 9:50	7-11°C	1	None	80%
2	16/05/2024	7:30 -9:30	12-15	0	None	30-40%

Visit No.	Date	Time	Temperature (°C) Start - End	Wind (Beaufort Scale)	Rain	Cloud Cover
3	20/06/2024	6:50 – 8:50	10-13	1	None	15%

Figure 2-4: Breeding Bird Transect Locations



### 2.2.2.3 Building Suitability Assessment

During the initial site walkover, the buildings onsite were assessed for the presence of nesting birds – including barn swallows, house martins and barn owls.

The assessment for barn swallows and house martins included assessing the buildings for any active or inactive nests, evidence of remnant nests, whitewash, moulted feathers or feeding remains.

The assessment for barn owls included an inspection of the buildings and adjacent trees for the following signs of potential barn owl presence:

- Male barn owl calling prior to laying season;
- Display flights over territory;
- Pellets, feathers and/or white streaking;
- Holes in the outside wall of buildings (minimum 75mm wide); and,
- Mature trees which are isolated, within treelines or on the edge of woodland with a diameter over 50cm and large, visible cavities.

Barn owl surveys were undertaken in conjunction with the bat surveys conducted on-site by suitably qualified and experienced MOR Environmental Ecologists on 13<sup>th</sup> and 29<sup>th</sup>

September 2023, 29<sup>th</sup> May and 29<sup>th</sup> June 2024, and 15<sup>th</sup> May, 22<sup>nd</sup> May and 16<sup>th</sup> June 2025. Any observations of barn owl were recorded through sightings and where possible, through sound.

An updated building assessment was completed during the habitat survey on 13<sup>th</sup> May 2025.

### 2.2.2.4 Barn Owl Surveys

Barn owl surveys were undertaken during bat surveys in the 2023, 2024 and 2025 breeding seasons in conjunction with the bat surveys. The barn owl surveys were conducted in line with the methodology described in:

- Raptors: A Field Guide for Surveys and Monitoring [11];
- Barn Owl (*Tyto alba*) Survey Methodology and Techniques for use in Ecological Assessment [12]; and,
- Transport infrastructure Irelands 'Barn Owl Surveying Standards for National Road Projects' [13].

The VPs utilised during these surveys changed to get a different observation of activity onsite from the previous year. The metadata for these surveys is outlined in Table 2-3. See Figures 2-5 to 2-8 for VP and transect locations.

Table 2-3: Barn Owl Survey Metadata

Date	Survey Type	Sunset	Survey Times (Start-End)	Weather	Temperature (°C) Start - End
<b>2023 Surveys</b>					
13/09/2023	Dusk	19:57	19:42 – 20:47	Rain at 20:47, gentle breeze	16°C-16°C
26/09/2023	Dusk	19:24	19:09 – 21:24	Dry, gentle breeze	13°C - 11°C
<b>2024 Surveys</b>					
29/05/2024	Dusk	21:41	21:26 – 23:41	Dry, light breeze	13°C - 11°C
25/06/2024	Dusk	21:58	21:43 – 23:58	Dry, light breeze	17°C - 15°C
<b>2025 Surveys</b>					
13/05/2025	Dusk	21:17	21:17 – 23:17	Dry, light breeze	14°C - 12°C
22/05/2025	Dusk	21:32	21:25 – 23:35	Dry, no breeze	16°C - 13°C
16/06/2025	Dusk	21:58	21:40 – 23:55	Dry, gentle breeze	16°C - 15°C

Figure 2-5: Bat and Barn Owl VP and Transects in 2023

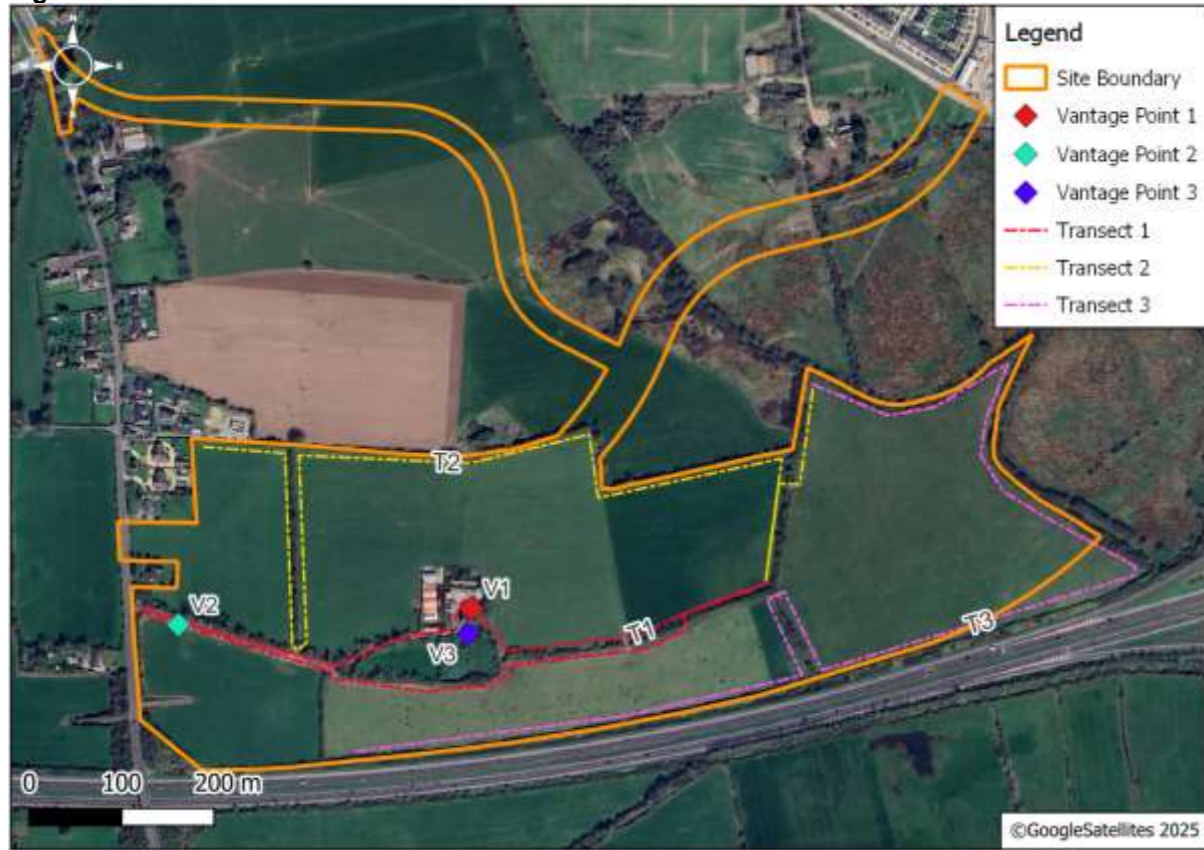


Figure 2-7: Bat and Barn Owl VP and Transects on 25/06/2024

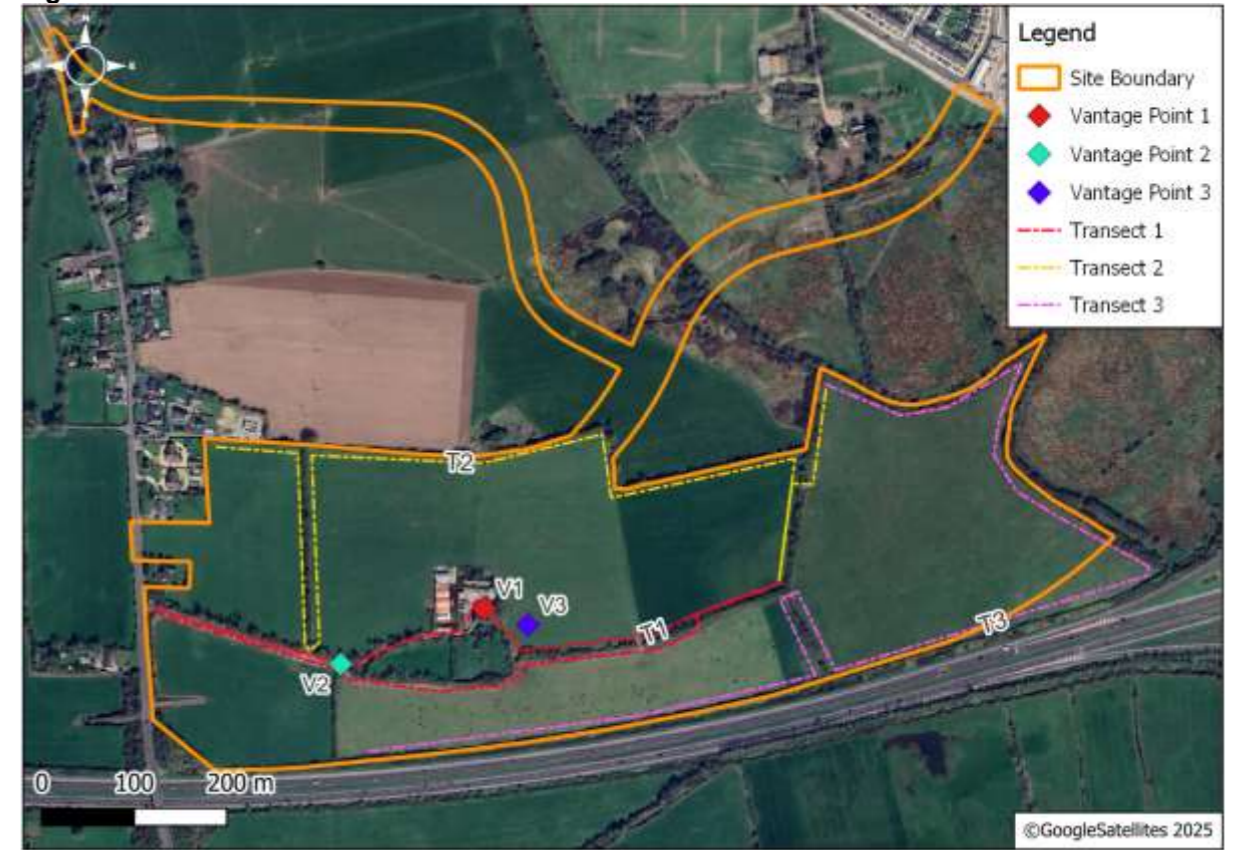


Figure 2-6: Bat and Barn Owl VP and Transect on 29/05/2024

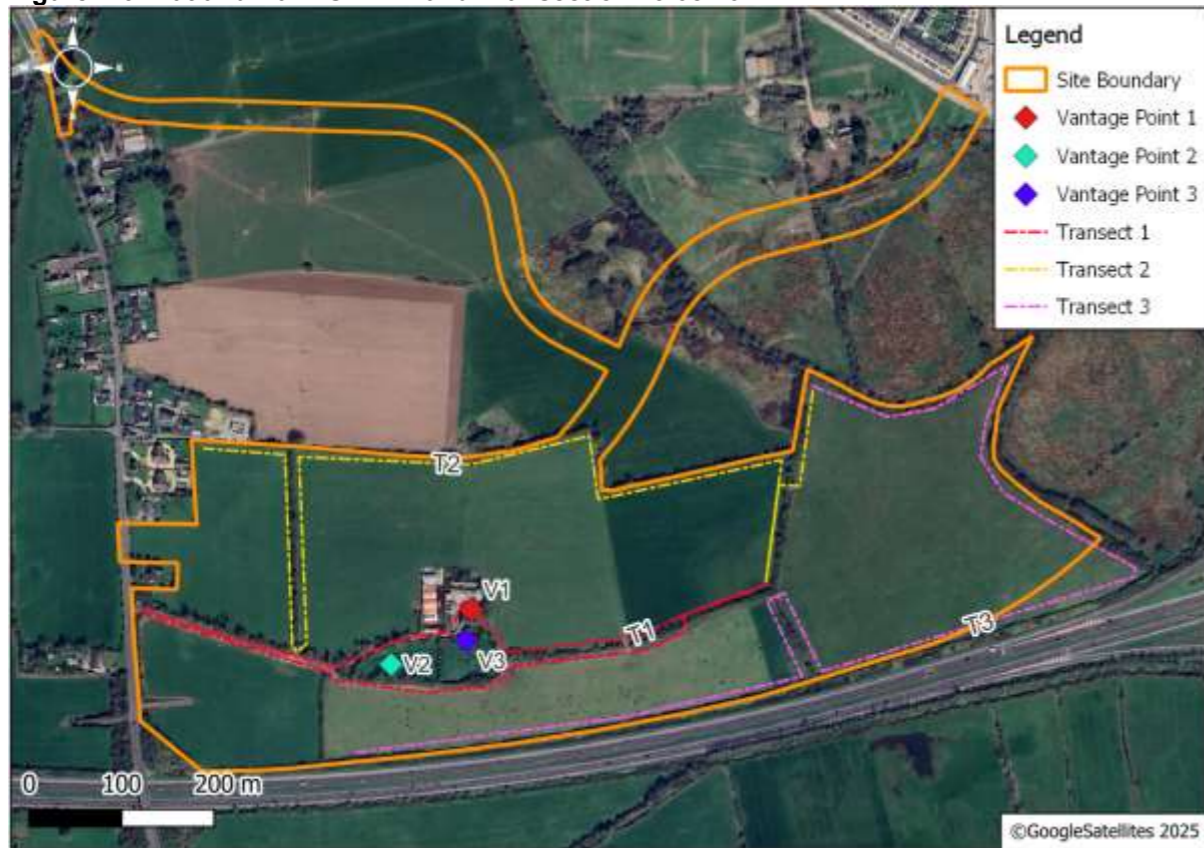


Figure 2-8: Bat and Barn Owl VP and Transects on 22/05/2025 and 16/06/2025



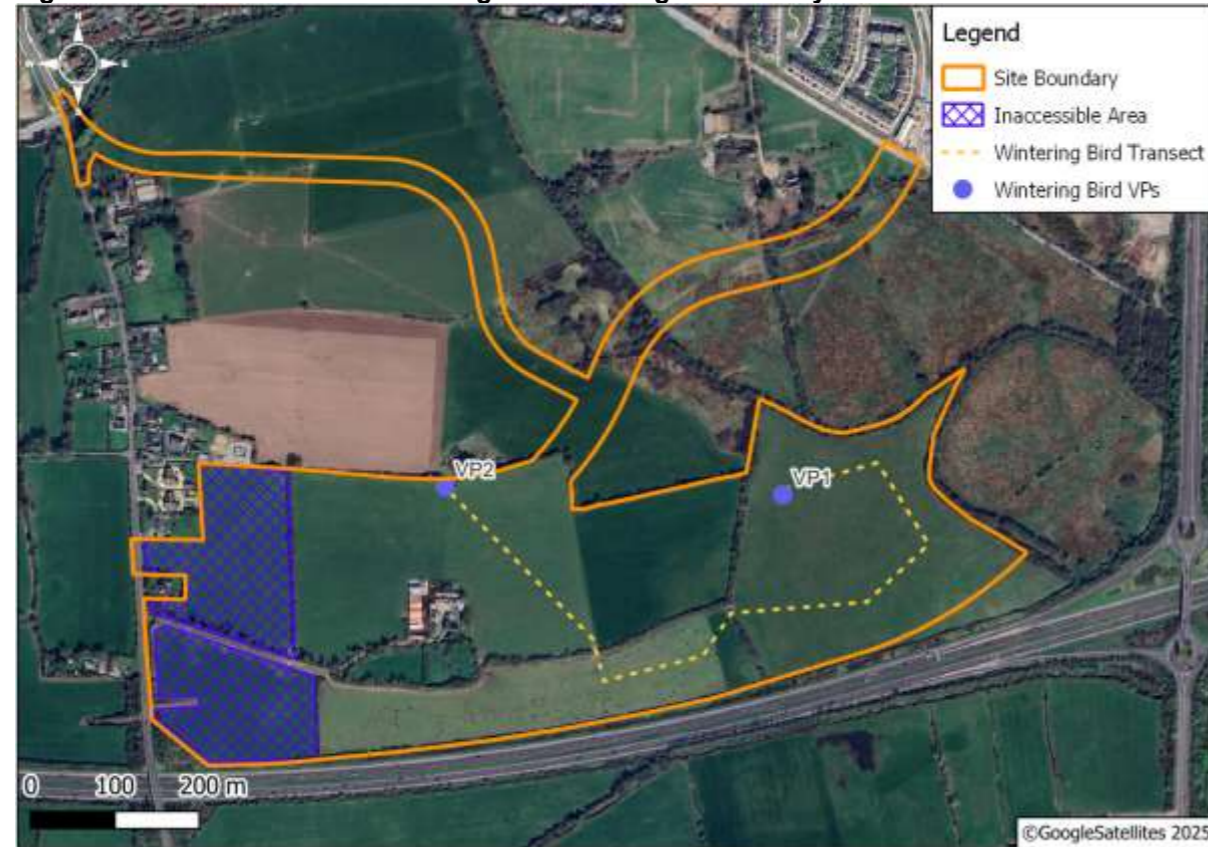
### 2.2.2.5 Survey Limitations

According to CIEEM Advice Note on the Lifespan of Ecological Reports and Surveys, survey data that is 12-18 months old can still remain valid following an updated survey by a professional ecologist and updated desk-based assessment to confirm that the Site has not experienced significant change and the local distribution of species in the wider area around the Site has not changed [14]. Following the updated surveys undertaken on 13<sup>th</sup> September 2024, 25<sup>th</sup> October 2024 and 13<sup>th</sup> May 2025 it was concluded that onsite habitats and the habitats in the wider area had not changed since 2023 and that the results of the 2023 / 2024 wintering surveys and 2024 breeding bird surveys remain valid.

During the wintering bird surveys, the fields in the east of the Site were inaccessible at the time of the surveys due to the presence of livestock, including bulls, see Figure 2-9.

Additionally, please note that updated breeding bird surveys are currently ongoing during the 2025 breeding survey season, and results will be submitted to CCC following completion.

**Figure 2-9: Inaccessible Fields during the Wintering Bird Surveys**



### 2.3 Avian Receptor Evaluation

The value of the avian receptors at the Site was evaluated using the ecological evaluation guidance given in the National Roads Authority ('NRA') guidance on the assessment of ecological impacts of National Road Schemes [15]. This guidance provides ratings for resources based primarily on geographic context and allows for resources at International, National, County and Local (higher and lower value) levels. Key ecological receptors for assessment are those deemed to be above the 'Local Importance (lower value)' evaluation (see Table 2-4).

**Table 2-4: NRA Guidance for Evaluation Criteria relevant to Avian Fauna**

Resource Evaluation	Criteria
International Importance	<p>'European Site' including Special Area of Conservation ('SAC'), Site of Community Importance ('SCI'), Special Protection Area ('SPA'), proposed Special Area of Conservation, or Proposed Special Protection Area ('pSPA').</p> <p>Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural &amp; Natural Heritage, 1972).</p> <p>Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).</p> <p>Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <ul style="list-style-type: none"> <li>Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive.</li> </ul>
National Importance	<p>Site designated or proposed as a Natural Heritage Area ('NHA'), Statutory Nature Reserve, Refuge for Fauna and Flora protected under the Wildlife Acts, or National Park,</p> <p>Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <ul style="list-style-type: none"> <li>Species protected under the Wildlife Acts; and / or</li> <li>Species listed on the relevant Red Data list.</li> </ul>
County Importance	<p>County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan ('BAP') (if this has been prepared).</p> <p>Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</p> <p>Resident or regularly occurring populations (assessed to be important at the County level) of the following:</p> <ul style="list-style-type: none"> <li>Species of bird, listed in Annex I and / or referred to in Article 4(2) of the Birds Directive.</li> <li>Species protected under the Wildlife Acts; and / or,</li> <li>Species listed on the relevant Red Data list.</li> </ul>
Local Importance (High Value)	<p>Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP (if this has been prepared).</p> <p>Resident or regularly occurring populations (assessed to be important at the Local level) of the following:</p> <ul style="list-style-type: none"> <li>Species of bird, listed in Annex I and / or referred to in Article 4(2) of the Birds Directive.</li> <li>Species protected under the Wildlife Acts; and / or,</li> <li>Species listed on the relevant Red Data list.</li> </ul>
Local Importance (Low Value)	<p>Species that remain common and widespread.</p> <p>Green-listed species.</p>

### 3 RESULTS

#### 3.1 Desk-Based Results

##### 3.1.1 National Biodiversity Data Centre

The NBDC was consulted for records of protected species within 2km of the Site. The NBDC records were checked on 6<sup>th</sup> May 2025. The following NBDC 2km grids have been checked: W56T, W56U, W56Y, W56Z, W57V, W66D, W66E, W66I, W66J, W67A and W67F [4]. These records are collated in Table 3-1.

Only species recorded within the past 10 years were included in Table 3-1. The parameter of 10 years was chosen based on habitat adaption and modification; it is considered that any records over 10 years old are not representative of the current distribution of species populations.

**Table 3-1: Protected Bird Species within 2km of Site**

Species	Scientific Name	Date of Last Record	Protected Status / BoCCI Status [16]
Barn Owl	<i>Tyto alba</i>	24/11/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern – Red List
Barn Swallow	<i>Hirundo rustica</i>	16/05/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Black-billed Magpie	<i>Pica pica</i>	05/05/2020	Birds of Conservation Concern Green List
Black-headed gull	<i>Larus ridibundus</i>	28/12/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern – Amber List
Blackcap	<i>Sylvia atricapilla</i>	29/06/2022	Birds of Conservation Concern Green List
Blue Tit	<i>Cyanistes caeruleus</i>	13/04/2021	Birds of Conservation Concern Green List
Cattle Egret	<i>Bubulcus ibis</i>	03/02/2008	Birds of Conservation Concern Green List
Canada Goose	<i>Branta canadensis</i>	25/10/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I Bird Species Invasive Species: High Impact Invasive Species
Chaffinch	<i>Fringilla coelebs</i>	11/02/2024	Birds of Conservation Concern Green List
Coal Tit	<i>Periparus ater</i>	11/02/2024	Birds of Conservation Concern Green List
Common Blackbird	<i>Turdus merula</i>	21/04/2023	Birds of Conservation Concern Green List
Common Bullfinch	<i>Pyrrhula pyrrhula</i>	19/03/2023	Birds of Conservation Concern Green List
Common Buzzard	<i>Buteo buteo</i>	10/08/2021	Birds of Conservation Concern Green List
Common Chiffchaff	<i>Phylloscopus collybita</i>	19/05/2020	Birds of Conservation Concern Green List
Common Greenshank	<i>Tringa nebularia</i>	25/10/20218	Wildlife Acts 1976 / 2000

Species	Scientific Name	Date of Last Record	Protected Status / BoCCI Status [16]
			Birds of Conservation Concern Green List
Common Kestrel	<i>Falco tinnunculus</i>	30/09/2018	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Kingfisher	<i>Alcedo atthis</i>	29/03/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern - Amber List
Common Linnet	<i>Carduelis cannabina</i>	17/06/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Moorhen	<i>Gallinula chloropus</i>	04/03/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern - Green List
Common Pheasant	<i>Phasianus colchicus</i>	17/04/2020	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section I Bird Species Birds of Conservation Concern Green List
Common Raven	<i>Corvus corax</i>	17/04/2020	Birds of Conservation Concern Green List
Common Starling	<i>Sturnus vulgaris</i>	31/07/2021	Wildlife Acts 1976 / 2000
Common Shelduck	<i>Tadorna tadorna</i>	28/04/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Snipe	<i>Gallinago gallinago</i>	28/03/2020	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II & III Birds of Conservation Concern – Amber List
Common Swift	<i>Apus apus</i>	16/07/2023	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Wood Pigeon	<i>Columba palumbus</i>	19/05/2020	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section I Bird Species Birds of Conservation Concern Green List
Cormorant	<i>Phalacrocorax carbo</i>	05/05/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern - Amber List
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	21/04/2023	Birds of Conservation Concern Green List
Eurasian Curlew	<i>Numenius arquata</i>	17/11/2021	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Birds of Conservation Concern – Red List
Eurasian Jackdaw	<i>Corvus monedula</i>	25/06/2019	Birds of Conservation Concern Green List

Species	Scientific Name	Date of Last Record	Protected Status / BoCCI Status [16]
Eurasian Jay	<i>Garrulus glandarius</i>	11/04/2018	Birds of Conservation Concern Green List
Eurasian Siskin	<i>Carduelis spinus</i>	19/03/2024	Birds of Conservation Concern Green List
Eurasian Sparrowhawk	<i>Accipiter nisus</i>	25/10/2018	Birds of Conservation Concern Green List
Eurasian Teal	<i>Anas crecca</i>	11/04/2024	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section II Bird Species Birds of Conservation Concern Amber List
Eurasian Treecreeper	<i>Certhia familiaris</i>	17/02/2024	Birds of Conservation Concern Green List
European Shag	<i>Phalacrocorax aristotelis</i>	11/04/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
European Golden Plover	<i>Pluvialis apricaria</i>	18/01/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Annex II Section II and Annex III and Section III Bird Species Birds of Conservation Concern Red List
European Goldfinch	<i>Carduelis carduelis</i>	25/04/2023	Birds of Conservation Concern Green List
European Greenfinch	<i>Carduelis chloris</i>	05/05/2020	Birds of Conservation Concern Green List
European Robin	<i>Erithacus rubecula</i>	06/09/2017	Birds of Conservation Concern Green List
Fieldfare	<i>Turdus pilaris</i>	04/03/2018	Birds of Conservation Concern Green List
Goldcrest	<i>Regulus regulus</i>	10/02/2024	Birds of Conservation Concern Amber List
Great Spotted Woodpecker	<i>Dendrocopos major</i>	11/02/2024	Birds of Conservation Concern Green List
Great Tit	<i>Parus major</i>	01/02/2021	Birds of Conservation Concern Green List
Grey Heron	<i>Ardea cinerea</i>	15/06/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern - Green List
Grey Wagtail	<i>Motacilla cinerea</i>	29/06/2024	Birds of Conservation Concern Red List
Hedge Accentor	<i>Prunella modularis</i>	19/05/2020	Birds of Conservation Concern Green List
Hooded Crow	<i>Corvus cornix</i>	25/10/2018	Birds of Conservation Concern Green List
House Martin	<i>Delichon urbicum</i>	04/06/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
House Sparrow	<i>Passer domesticus</i>	08/03/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List

Species	Scientific Name	Date of Last Record	Protected Status / BoCCI Status [16]
Lesser Black-backed Gull	<i>Larus fuscus</i>	28/04/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Little Egret	<i>Egretta garzetta</i>	15/06/2020	Wildlife Acts 1976 / 2000 EU Birds Directive Annex I Birds of Conservation Concern - Green List
Long-eared Owl	<i>Asio otus</i>	08/07/2018	Birds of Conservation Concern - Green List
Long-tailed Tit	<i>Aegithalos caudatus</i>	11/02/2024	Birds of Conservation Concern - Green List
Mallard	<i>Anas platyrhynchos</i>	11/04/2021	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II & III Birds of Conservation Concern – Amber List
Mistle Thrush	<i>Turdus viscivorus</i>	18/01/2024	Birds of Conservation Concern Green List
Mute Swan	<i>Cygnus olor</i>	11/04/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern - Amber List
Northern Lapwing	<i>Vanellus vanellus</i>	18/01/2018	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Northern Shoveler	<i>Anas clypeata</i>	19/05/2020	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II & III Birds of Conservation Concern –Red List
Pied Wagtail	<i>Motacilla alba subsp. yarrellii</i>	02/05/2020	Birds of Conservation Concern Green List
Red Kite	<i>Milvus milvus</i>	29/06/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Redwing	<i>Turdus iliacus</i>	18/01/2024	Birds of Conservation Concern Red List
Rook	<i>Corvus frugilegus</i>	06/09/2017	Birds of Conservation Concern Green List
Sand Martin	<i>Riparia riparia</i>	11/04/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Song Thrush	<i>Turdus philomelos</i>	11/02/2024	Birds of Conservation Concern Green List
Stonechat	<i>Saxicola torquata</i>	01/01/2018	Birds of Conservation Concern Green List
White-throated Dipper	<i>Cinclus cinclus</i>	16/05/2020	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Green List

Species	Scientific Name	Date of Last Record	Protected Status / BoCCI Status [16]
Winter Wren	<i>Troglodytes troglodytes</i>	19/06/2018	Birds of Conservation Concern Green List

### 3.1.2 I-WeBS

I-WeBS data was requested for nearby sites within the vicinity of the Site. The records were reviewed in order to gain an understanding into the potential assemblage of bird populations that may utilise the areas within the vicinity of the Site.

Data from three sites and two subsites, was received (refer to Section 2.1.1).

#### Garryhesta Gravel Pit (Site Code: 0L202)

The I-WeBS data for wintering seasons between the years 1995/1996 and 1998/1999, and between the years 2005/2006 and 2008/2009, were available for the Garryhesta Gravel Pit site. A total of 20 species were recorded during this period. However, during the most recent counts available for the 2008/2009 season, only a total of 10 species were recorded.

None of the species recorded were recorded in numbers that would be considered of international importance. However:

- Teal were recorded in numbers that would be considered to be of national importance during the 1995/1996 season; and,
- Pochard were recorded in numbers that would be considered to of national importance during the 2007/2008 season.

#### Blarney Lake (Site Code: 0L040)

The I-WeBS data for wintering seasons between 1994/1995 to 2023/2024 was available the Blarney Lake site. However, it should be noted that data from 2005/2006, 2007/2008, between 2009/2010 and 2013/2014 and between 2025/2016 and 2022/2023 was unavailable. A total of 24 species were recorded during this period. However, during the most recent counts available for the 2022/2024 season, a total of 15 species were recorded. No species were recorded at numbers of national or international importance at this site.

#### Blarney Fen – Clogheenmilcon (Site Code: 0L320)

The I-WeBS data for wintering seasons between the years 1995/1996 and 2003/2004, 2006/2007, 2014/2015 and 2023/2024 were available for the Blarney Fen – Clogheenmilcon site. A total of 23 species were recorded during this period. However, during the most recent counts available for the 2023/2024 season, only a total of 12 species were recorded.

None of the species recorded were recorded in numbers that would be considered of international importance. However:

- Shoveler were recorded in numbers that would be considered to be of national importance during the 2023/2024 season.

#### Cork Harbour – Douglas Estuary (Site Code: 0L403, Subsite Code: 0L488)

The I-WeBS data for wintering seasons for 1995/1996, 1997/1998, 1998/1999 and between the years 2005/2006 and 2008/2009 were available for the Douglas Estuary subsite site. A total of 20 species were recorded during this period. However, during the most recent counts available for the 2008/2009 season, only a total of 10 species were recorded.

None of the species recorded were recorded in numbers that would be considered of international importance. However, several species were recorded in numbers that would be considered to be of national importance, including:

- Shelduck were recorded at numbers of national importance between the 1994/1995, 1995/1996, 1996/1997 and 2000/2001, 2001/2002, 2003/2003, 2003/2004, 2004/2005, 2005/2006, 2006/2007, 2007/2008, 2009/2010, 2010/2011, 2011/2012 seasons;
- Wigeon were recorded at numbers of national importance during the 1994/1995 season;
- Teal were recorded at numbers of national importance during the 1995/1996, 2000/2001 and the 2003/2004 seasons;
- Great crested grebe were recorded at numbers of national importance during the 1995/1996, 1996/1997 and 2001/2002 seasons;
- Little egret were recorded at numbers of national importance during the 2004/2005, 2007/2008, 2009/2010 and 2014/2015 seasons;
- Oystercatcher were recorded at numbers of national importance during the 1996/1997 season;
- Golden plover were recorded at numbers of national importance during the 1994/1995, 1996/1997, 2000/2001, 2001/2002, 2003/2003, 2003/2004, 2004/2005, 2005/2006, 2006/2007, 2007/2008, 2009/2010, 2010/2011, 2011/2012, 2012/2013, 2013/2014, 2014/2015, 2015/2016, 2017/2018, 2018/2019 and 2021/2022 seasons;
- Lapwing were recorded at numbers of national importance during the 1994/1995, 1995/1996, 1996/1997, 2000/2001, 2002/2003, 2003/2004, 2004/2005, 2005/2006, 2007/2008, 2010/2011, 2011/2012, 2013/2014 and 2014/2015 seasons;
- Knot were recorded at numbers of national importance during the 2010/2011 season;
- Dunlin were recorded at numbers of national importance during all seasons with data available (1995/1996, 1997/1998, 1998/1999 and between the years 2005/2006 and 2008/2009);
- Bar-tailed godwit were recorded at numbers of national importance during all seasons with data available except the 1994/1995 and 2023/2021 seasons;
- Curlew were recorded at numbers of national importance during the 1995/1996, 1996/1997, 2002/2003, 2003/2004, 2004/2005, 2005/2006, 2007/2008, 2010/2011, 2011/2012, 2013/2014, 2014/2015 and 2021/2022 seasons; and,
- Redshank were recorded at numbers of national importance during the 1995/1996, 1996/1997, 2002/2003, 2003/2004, 2004/2005, 2005/2006, 2006/2007, 2007/2008, 2009/2010, 2011/2012, 2012/2013, 2013/2014, 2014/2015, 2016/2017, 2019/2020, 2020/2021, 2021/2022 and 2022/2023 seasons.

#### Cork Harbour – Dunkettle (Site Code: 0L403, Subsite Code: 0L486)

The I-WeBS data for wintering seasons between the years 1994/1995 and 2023/2024 were available for the Dunkettle subsite, with the exception of the 2005/2006 and 2020/2021 seasons. A total of 43 species were recorded during this period. However, during the most recent counts available for the 2023/2024 season, only a total of 15 species were recorded.

None of the species recorded were recorded in numbers that would be considered of international importance. However, several species were recorded in numbers that would be considered to be of national importance, including:

- Cormorant were recorded at numbers of national importance during the 1996/1997 season;
- Dunlin were recorded at numbers of national importance during the 1994/1995, 1995/1996, 1996/1997, 1997/1998, 1998/1999, 1999/2000, 2000/2001, 2001/2002, 2008/2009 and 2021/2013 seasons;
- Black-tailed godwit were recorded at numbers of national importance during the 1996/1997, 2001/2002, 2002/2003, 2008/2009, 2010/2011, 2011/2012, 2013/2014, 2015/2016, 2016/2017, 2019/2020 and 2021/2022 seasons;
- Bar-tailed Godwit were recorded at numbers of national importance during the 1994/1995, 1995/1996 and 2001/2002 seasons;
- Curlew were recorded at numbers of national importance during the 2014/2015 season; and,
- Greenshank were recorded at numbers of national importance during the 2013/2014 season.

### **3.2 Field-Based Results**

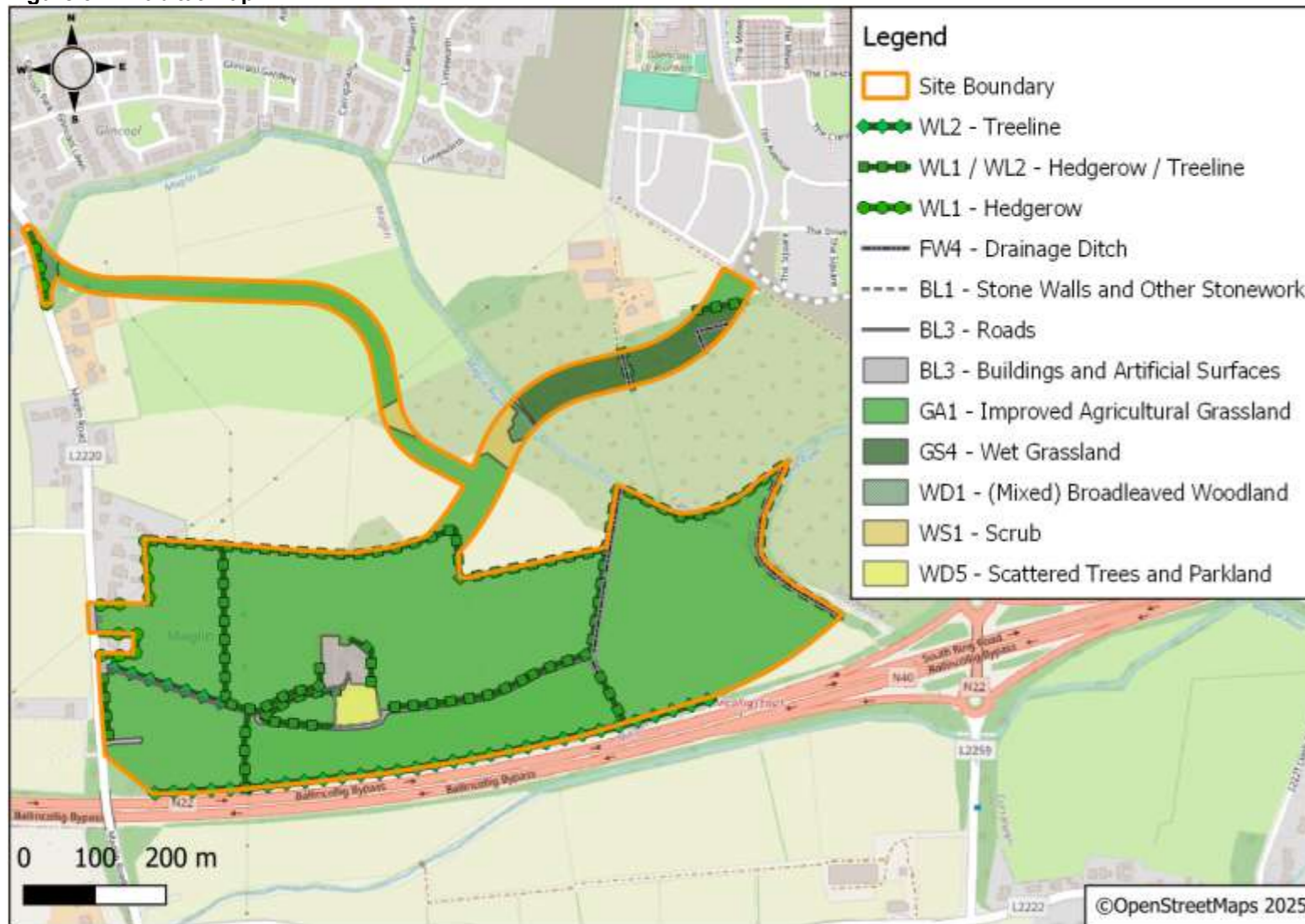
#### **3.2.1 Habitat Survey**

The habitat assessment identified the following habitats onsite:

- Buildings and Artificial Surfaces (BL3);
- Depositing / lowland River (FW2) – Grange Hill River
- Drainage Ditch (FW4);
- Hedgerow/Treeline (WL1 / WL2);
- Improved Agricultural Grassland (GA1);
- Mixed Broadleaved Woodland (WD1);
- Scattered Trees and Parkland (WD5) – the old orchard;
- Scrub (WS1);
- Stone Walls and Other Stonework (BL1); and,
- Wet Grassland (GS4).

The distribution of habitats is illustrated below in Figure 3-1.

Figure 3-1: Habitat Map



### 3.2.2 Wintering Bird Survey

Three wintering bird surveys were undertaken on the 20<sup>th</sup> November 2023, 12<sup>th</sup> December 2023 and 17<sup>th</sup> January 2024.

During the surveys, eight bird species were recorded:

- Three green-listed species – buzzard (*Buteo buteo*), fieldfare (*Turdus pilaris*) and sparrowhawk (*Accipiter nisus*);
- One amber-listed species – herring gull (*Larus argentatus*); and,
- Four red-listed species – curlew (*Numenius arquata*), kestrel (*Falco tinnunculus*), redwing (*Turdus iliacus*) and snipe (*Gallinago gallinago*).

No Annex I bird species were recorded during the surveys. Of the species recorded, one is a designated species under the Cork Harbour SPA – curlew. Additionally, there were two species recorded on-site that would fall under the classification of 'Wetland and Waterbirds [A999]' under the Cork Harbour SPA – herring gull and snipe.

Table 3-2 provides a record of the bird species identified during the wintering bird surveys, the number of individuals recorded during the surveys and the species' designation under the BoCCI 2020-2026, which is the third assessment of the status of all regularly occurring birds on the island of Ireland [16].

During the wintering bird surveys, no large flocks of wintering bird species were recorded on the Site. No winter roosts or foraging sites were identified on-site.

It is important to note that while curlew and herring gull were recorded during the surveys, these species were recorded flying over the Site and were not recorded interacting with the Site at any point.

**Table 3-2: Birds recorded during Wintering Bird Surveys**

BoCCI Conservation Status	Species	Scientific Name	Number Recorded			Notes
			Visit 1	Visit 2	Visit 3	
Green-listed	Buzzard	<i>Buteo buteo</i>	1	0	0	Visit 1: An individual was heard calling and seen flying and circling over the agricultural grassland. Visit 2 and 3: No individuals were recorded during this survey.
	Fieldfare	<i>Turdus pilaris</i>	0	0	2	Visit 1 and 2: No individuals were recorded during this survey. Visit 3: Two individuals were noted perching on the northern hedgerow / treeline.
	Sparrowhawk	<i>Accipiter nisus</i>	0	1	0	Visit 1: No individuals were recorded during this survey. Visit 2: An individual was observed flying west over the centre of the Site. This individual did not land or interact with the Site. Visit 3: No individuals were recorded during this survey.
Amber-listed	Herring Gull	<i>Larus argentatus</i>	8	0	0	Visit 1: Individuals were noted flying northwest and south over the Site but did not land or interact with the Site. Visit 2 and 3: No individuals were recorded during this survey.
Red-listed	Curlew	<i>Numenius arquata</i>	0	0	20	Visit 1 and 2: No individuals were recorded during this survey. Visit 3: A flock of 17 individuals was observed flying southeast over the eastern field above the trees. Three individuals were observed flying northwest over the eastern field. None of these species landed or interacted with the Site.
	Kestrel	<i>Falco tinnunculus</i>	1	1	0	Visit 1: An individual was observed perching on a pole along the track in the centre of the Site. Visit 2: An individual was observed flying northeast over the eastern field of the Site. This individual did not land or interact with the Site. Visit 3: No individuals were recorded during this survey.

BoCCI Conservation Status	Species	Scientific Name	Number Recorded			Notes
			Visit 1	Visit 2	Visit 3	
	Redwing	<i>Turdus iliacus</i>	1	0	8	Visit 1: An individual was heard calling from the hedgerow / treeline in the northeast of the Site. Visit 2: No individuals were recorded during this survey. Visit 3: Individuals were foraging in the northern field and flew north.
	Snipe	<i>Gallinago gallinago</i>	1	1	7	Visit 1: An individual was flushed from the eastern agricultural grassland field and flew north. Visit 2: An individual was flushed from the eastern field and flew northwest. Visit 3: Individuals were flushed from the eastern field and flew northwest, southeast and south.

Table 3-3 illustrates the distribution of each species within the zones of the fields of the survey area.

**Table 3-3: Distribution of the Recorded Species within each Zone during the Winter Bird Surveys**

BoCCI Conservation Status	Species	Latine Name	Presence within each Zone		
			Boundary	Margin	Interior
Green	Buzzard	<i>Buteo buteo</i>	Flying over the Site		
	Fieldfare	<i>Turdus pilaris</i>	Present		
	Sparrowhawk	<i>Accipiter nisus</i>	Flying over the Site		
Amber	Herring-gull	<i>Larus argentatus</i>	Flying over the Site		
Red	Curlew	<i>Numenius arquata</i>	Flying over the Site		
	Kestrel	<i>Falco tinnunculus</i>			Present
	Redwing	<i>Turdus iliacus</i>	Present	Present	
	Snipe	<i>Gallinago gallinago</i>			Present

### 3.2.3 Breeding Bird Survey

Table 3-4 contains a summary of the birds recorded in the Site during the breeding bird surveys, the behaviours exhibited during the surveys, their status according to BoCCI and the breeding status of all birds noted.

A total of 33 species were recorded either within the Site or flying over the Site during the surveys.

Of the 33 species that were recorded:

- 26 Green-listed BoCCI, non-Annex I species were recorded – blackbird, blackcap, blue tit, bullfinch, buzzard, chaffinch, chiffchaff, dunnock, feral pigeon, goldfinch, grasshopper warbler, great tit, grey heron, hooded crow, jackdaw, long-tailed tit, magpie, mistle thrush, pheasant, pied wagtail, robin, rook, song thrush, treecreeper, woodpigeon and wren;
- Seven Amber-listed BoCCI, non-Annex I species were recorded – goldcrest, greenfinch, house sparrow, mallard, starling, swallow and willow warbler; and,
- No Red-listed BoCCI, Annex or non-Annex I species were recorded.

During the surveys, no species were exhibiting behaviours that would be classified as 'Confirmed Breeding', and no active nests nor signs of nest building were recorded within the Site. However, 23 species were observed displaying territorial behaviours and were classified as 'Possible Breeding' - blackbird, blackcap, blue tit, bullfinch, chaffinch, chiffchaff, dunnock, goldcrest, goldfinch, grasshopper warbler, great tit, greenfinch, hooded crow, long-tailed tit, magpie, mistle thrush, robin, rook, song thrush, treecreeper, willow warbler, woodpigeon and wren. Whereas, ten species were classified as non-breeding – buzzard, feral pigeon, grey heron, jackdaw, pied wagtail, pheasant, house sparrow, mallard, starling and swallow.

No Annex I bird species were recorded during the surveys. Of the species recorded, two species recorded onsite that would fall under the classification of 'Wetland and Waterbirds [A999]' under the Cork Harbour SPA – grey heron and mallard.

**Table 3-4: Birds recorded within the Site during the Breeding Bird Season**

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
Green-Listed	Blackbird	<i>Turdus merula</i>	14	13	17	<p><u>Visit 1:</u> Individuals were observed flying southeast over the Site, perched in hedgerow / treeline and foraging in grassland and farmyard and orchard.</p> <p><u>Visit 2:</u> Individuals were noted perched, calling and singing from the hedgerow / treelines and foraging in the agricultural grassland throughout the Site.</p> <p><u>Visit 3:</u> Individuals were noted perching and flushed from the hedgerow / treelines, foraging in the agricultural grassland and flying over the Site. Two juveniles were noted perching in the hedgerow / treeline south of the orchard.</p>	Possible Breeding
	Blackcap	<i>Sylvia atricapilla</i>	2	3	0	<p><u>Visit 1:</u> Individuals were noted calling from the hedgerow / treeline on the eastern boundary of the Site.</p> <p><u>Visit 2:</u> Individuals were noted calling from the internal hedgerow / treelines and orchard.</p> <p><u>Visit 3:</u> No individuals were recorded during this survey.</p>	Possible Breeding
	Blue Tit	<i>Cyanistes caeruleus</i>	10	7	4	<p><u>Visit 1:</u> Individuals were noted perching, calling and foraging from the hedgerow / treelines throughout the Site and the orchard.</p> <p><u>Visit 2:</u> Individuals were noted calling, singing and foraging in the hedgerow / treelines throughout the Site.</p> <p><u>Visit 3:</u> Individuals were noted singing and calling in the northern boundary of the Site and along the internal access track to the farmyard.</p>	Possible Breeding
	Bullfinch	<i>Pyrrhula pyrrhula</i>	0	2	0	<p><u>Visit 1 and 3:</u> No individuals were recorded during these surveys.</p> <p><u>Visit 2:</u> An individual was noted perching and calling from the fence in the northwestern boundary of the Site and another individual was noted calling from the internal hedgerow / treeline in the eastern field.</p>	Possible Breeding
	Buzzard	<i>Buteo buteo</i>	1	0	1	<p><u>Visit 1:</u> An individual was noted circling over the agricultural grassland in the centre of the northern section of the Site.</p> <p><u>Visit 2:</u> No individuals were recorded during this survey.</p> <p><u>Visit 3:</u> An individual was noted flying and soaring over the southwest of the Site.</p>	Non-breeding

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
	Chaffinch	<i>Fringilla coelebs</i>	5	6	3	<p><u>Visit 1:</u> Individuals were noted foraging in the agricultural grassland and farmyard and perching and calling from the internal hedgerow / treelines onsite.</p> <p><u>Visit 2:</u> Individuals were noted calling, perching in the hedgerow / treelines in the eastern field and around the farmyard. Two individuals were flushed in from the hedgerow / treeline in the southeastern field.</p> <p><u>Visit 3:</u> Two individuals were noted calling from the hedgerow / treeline in the northeast of the Site and one individual was noted calling from the hedgerow / treeline surrounding the farmyard.</p>	Possible Breeding
	Chiffchaff	<i>Phylloscopus collybita</i>	1	1	3	<p><u>Visit 1:</u> An individual was noted calling from the centre of the hedgerow / treeline along the southern boundary of the Site.</p> <p><u>Visit 2:</u> An individual was noted calling from the area of woodland adjacent to the southwestern corner of the Site.</p> <p><u>Visit 3:</u> Individuals were noted calling from the internal hedgerow / treelines in the east of the Site and an individual was noted flying northeast over the eastern field.</p>	Possible Breeding
	Dunnock	<i>Prunella modularis</i>	4	5	8	<p><u>Visit 1:</u> An individual was noted foraging in the scrub on the northern boundary of the Site. Individuals were noted calling from the hedgerow / treelines on the northern boundary of the Site.</p> <p><u>Visit 2:</u> Individuals were noted calling and perching along the hedgerow treelines onsite. An individual was flushed from the western hedgerow / treeline.</p> <p><u>Visit 3:</u> Individuals were noted calling, foraging, and perching on the hedgerow / treelines throughout the Site.</p>	Possible Breeding
	Feral Pigeon	<i>Columba livia f. domestica</i>	3	0	1	<p><u>Visit 1:</u> Individuals were observed perching on shed in the farmyard.</p> <p><u>Visit 2:</u> No individuals were recorded during this survey.</p> <p><u>Visit 3:</u> An individual was noted perching in the farmyard.</p>	Non-breeding
	Goldfinch	<i>Carduelis carduelis</i>	10	10	1	<p><u>Visit 1:</u> Individuals were noted foraging in the agricultural grassland and calling and singing from the hedgerow / treelines throughout the Site.</p> <p><u>Visit 2:</u> Individuals were noted calling and foraging from the hedgerow / treelines throughout the Site. An individual was flushed from the internal hedgerow / treelines along the internal boundary of the eastern field.</p>	Possible Breeding

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						<u>Visit 3</u> : An individual was noted singing in the hedgerow / treeline along the northern boundary of the Site.	
	Grasshopper Warbler	<i>Locustella naevia</i>	0	1	0	<u>Visit 1 and 3</u> : No individuals were recorded during these surveys. <u>Visit 2</u> : An individual was noted calling from the boundary of the orchard.	Possible Breeding
	Great Tit	<i>Parus major</i>	6	5	2	<u>Visit 1</u> : Individuals were noted calling and foraging from the hedgerow / treelines and orchard onsite. <u>Visit 2</u> : Individuals were noted singing in the orchard, foraging in the hedgerow/ treeline on the eastern boundary, and calling from internal hedgerow / treeline in centre of the Site and flying south. <u>Visit 3</u> : Individuals were noted calling in the hedgerow / treeline in the centre of the Site.	Possible Breeding
	Grey Heron	<i>Ardea cinerea</i>	1	0	0	<u>Visit 1</u> : An individual was noted flying northwest over the eastern field of the Site. <u>Visit 2 and 3</u> : No individuals were recorded during this survey	Non-breeding
	Hooded Crow	<i>Corvus cornix</i>	6	6	3	<u>Visit 1</u> : Individuals were noted perching on the hedgerow / treelines throughout the Site and an individual was noted carrying nest building materials in its beak in the eastern field. <u>Visit 2</u> : Individuals were noted flying over the Site, flushed from the internal hedgerow / treelines and foraging in the agricultural grassland. <u>Visit 3</u> : Individuals were noted flying east over the Site and calling from the hedgerow / treeline in the centre of the Site.	Possible Breeding
	Jackdaw	<i>Coloeus monedula</i>	0	20	11	<u>Visit 1</u> : No individuals were recorded during this survey. <u>Visit 2</u> : Individuals were noted flying over the Site, perching in the hedgerow / treeline and foraging in groups in the agricultural grassland. <u>Visit 3</u> : Individuals were noted flying over the Site, perching in the farmyard and western hedgerow / treeline.	Non-breeding
	Long -tailed Tit	<i>Aegithalus caudatus</i>	2	1	0	<u>Visit 1</u> : Individuals were noted calling from the orchard and the internal hedgerow / treeline. <u>Visit 2</u> : An individual was noted calling from the internal hedgerow / treeline in the southwest of the eastern field.	Possible Breeding

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3: No individuals were recorded during this survey.	
	Magpie	<i>Pica pica</i>	1	2	5	Visit 1: An individual was noted perching on a shed in the farmyard. Visit 2: An individual was flushed from the agricultural grassland in the northwest of the Site and another individual was noted perching in the farmyard. Visit 3: Individuals were noted flying over the Site, flushed, calling, perching in the hedgerow / treelines.	Possible Breeding
	Mistle Thrush	<i>Turdus viscivorus</i>	0	1	0	Visit 1 and 3: No individuals were recorded during these surveys. Visit 2: An individual was noted calling from the hedgerow / treeline along the eastern boundary of the Site.	Possible Breeding
	Pied Wagtail	<i>Motacilla alba yarrellii</i>	1	0	0	Visit 1: An individual was noted foraging in the farmyard. Visit 2 and 3: No individuals were recorded during these surveys.	Non-breeding
	Pheasant	<i>Phasianus colchicus</i>	1	0	0	Visit 1: An individual was noted walking east along the access track in the east of the Site. Visit 2 and 3: No individuals were recorded during these surveys.	Non-breeding
	Robin	<i>Erithacus rubecula</i>	16	16	10	Visit 1: Individuals were noted perching, calling and foraging throughout the Site. Visit 2: Individuals were noted calling, singing and perching throughout the Site. Visit 3: Individuals were noted foraging, calling and perching throughout the Site.	Possible Breeding
	Rook	<i>Corvus frugilegus</i>	13	12	16	Visit 1: Individuals were noted flying over the Site throughout the survey. One individual was noted flying with nest building materials. Visit 2: Individuals were noted calling from the hedgerow /treelines and flying over the Site. Visit 3: Individuals were noted flying over the Site, foraging in the agricultural grassland in the south of the Site and calling and perching in the hedgerow / treelines.	Possible Breeding
	Song Thrush	<i>Turdus philomelos</i>	8	2	3	Visit 1: Individuals were noted calling from the hedgerow / treelines onsite and flying over the orchard. Visit 2: An individual was noted singing in the northern hedgerow / treeline boundary and another individual was noted singing in the orchard.	Possible Breeding

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						<u>Visit 3:</u> Individuals were noted calling in the hedgerow / treelines in the north and northeast of the Site and foraging along the access track near the entrance of the Site.	
	Treecreeper	<i>Certhia familiaris</i>	0	0	1	<u>Visit 1 and 2:</u> No individuals were recorded during these surveys. <u>Visit 3:</u> An individual was noted calling from the northwestern hedgerow / treeline of the eastern field.	Possible Breeding
	Woodpigeon	<i>Columba palumbus</i>	17	16	11	<u>Visit 1:</u> Individuals were noted perching on the hedgerow / treelines and flushed from them. Individuals were also noted flying over the Site. <u>Visit 2:</u> Individuals were flushed from and perching in the hedgerow / treelines throughout the Site and observed flying over the Site. <u>Visit 3:</u> Individuals were noted flying over the Site, perching, calling and flushed from the hedgerow / treelines throughout the Site.	Possible Breeding
	Wren	<i>Troglodytes troglodytes</i>	18	21	18	<u>Visit 1:</u> Individuals were noted calling from the hedgerow / treelines throughout the Site. <u>Visit 2:</u> Individuals were noted calling from the hedgerow / treelines throughout the Site. <u>Visit 3:</u> Individuals were noted calling from the hedgerow / treelines throughout the Site.	Possible Breeding
Amber-Listed	Goldcrest	<i>Regulus regulus</i>	1	6	4	<u>Visit 1:</u> An individual was noted calling from the hedgerow in the northwest of the Site. <u>Visit 2:</u> Individuals were noted calling and singing from the hedgerow / treelines in the northern and western boundaries and the eastern field. <u>Visit 3:</u> Individuals were noted calling and singing from the hedgerow / treelines in the north, northeast and west of the Site.	Possible Breeding
	Greenfinch	<i>Chloris chloris</i>	2	1	0	<u>Visit 1:</u> An individual was noted calling from the internal hedgerow / treeline in the west of the Site and another individual was noted calling from the hedgerow / treeline in the northeast of the Site. <u>Visit 2:</u> An individual was noted calling from the hedgerow / treeline along the access track to the farmyard. <u>Visit 3:</u> No individuals were recorded during this survey.	Possible Breeding
	House Sparrow	<i>Passer domesticus</i>	3	4	4	<u>Visit 1:</u> Individuals were noted perching and calling from the western hedgerow / treeline south of the access track	Non-breeding

BoCCI Status	Species	Latin Name	Numbers Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						<p><u>Visit 2:</u> Four individuals were noted foraging in the agricultural grassland in the northwest corner of the Site boundary.</p> <p><u>Visit 3:</u> Four individuals were noted calling in the northwestern hedgerow / treeline.</p>	
	Mallard	<i>Anas platyrhynchos</i>	1	0	0	<p><u>Visit 1:</u> An individual was noted flying south over the eastern field.</p> <p><u>Visit 2 and 3:</u> No individuals were recorded during these surveys</p>	Non-breeding
	Starling	<i>Sturnus vulgaris</i>	22	34	41	<p><u>Visit 1:</u> Individuals were noted foraging in the agricultural grassland, calling from the hedgerow / treelines and flying over the Site.</p> <p><u>Visit 2:</u> No individuals were recorded during these surveys.</p> <p><u>Visit 3:</u> A group of 20 individuals were noted foraging in the southwestern field, 18 individuals were noted perching on the telephone wire in the north of the Site and the remaining individuals were noted foraging in the northwestern field and perching on the western hedgerow / treeline.</p>	Non-breeding
	Swallow	<i>Hirundo rustica</i>	1	18	4	<p><u>Visit 1:</u> An individual was noted perching on a telephone wire in the farmyard.</p> <p><u>Visit 2:</u> Groups of individuals were noted foraging in the northwestern and central north fields. Three individuals were noted perching in the farmyard.</p> <p><u>Visit 3:</u> Individuals were foraging in the southwestern field and central northern field.</p>	Non-breeding
	Willow Warbler	<i>Phylloscopus trochilus</i>	1	6	3	<p><u>Visit 1:</u> An individual was noted calling from the northeastern hedgerow / treeline.</p> <p><u>Visit 2:</u> Individuals were noted calling from the boundaries of the eastern field.</p> <p><u>Visit 3:</u> Individuals were noted calling and perching in the hedgerow / treeline on the eastern boundary of the Site.</p>	Possible Breeding

### 3.2.4 Building Suitability Assessment

During the initial walkover, the buildings were noted as having gaps / holes that could allow entrance for small birds to enter. Therefore, the buildings were inspected in details to determine whether or not birds were utilising the buildings for nesting purposes.

The 2023 building inspections did not identify any evidence of birds nesting. There were no remnant nests indicated barn swallow, house martin or barn owl had utilised the buildings for nesting. Additionally, no nests of any other species were identified within the buildings.

Furthermore, the updated building inspection in 2025 did not identify any evidence of nesting birds.

In addition, during the barn owl / bat surveys, there was no evidence of swifts utilising the buildings or the airspace above the Site.

### 3.2.5 Barn Owl Survey

#### 2023 Surveys

13/09/2023

No evidence of barn owl utilising the Site.

26/09/2023

The surveyor at VP1 observed an adult barn owl flying across the farmyard below the level of the house and trees, ca. 2-3m high.

#### 2024 Surveys

29/05/2024

No evidence of barn owl utilising the Site. Furthermore, there were no observations of barn owl recorded during the survey.

25/06/2024

The survey identified evidence of barn owl was identified in the presence of a pellet on a fencepost.

Additionally, all three surveyors observed barn owls. At VP3, an adult barn owl was observed flying from behind the hedgerow / treeline and into the farmyard. The surveyor at VP1 observed the same barn owl flying across the farmyard below the levels of trees, ca. 2-3m high, and appeared to be hunting over the Site.

During the transects, two barn owls were identified. One barn owl was observed perching on a water trough, and another was observed flying over the field to the east of the Site.

#### 2025 Surveys

13/05/2025, 22/05/2025 & 16/06/2025

No evidence of barn owl or observations of barn owl were identified during the 2025 surveys.

The buildings on-site had no evidence of barn owls nesting. It is considered that barn owl may utilise the Site for foraging and commuting purposes.

#### Anecdotal Evidence

The farmer onsite has mentioned that barn owls are seen foraging and commuting over the Site; however, the farmer has not seen any evidence of nesting barn owls and does not believe that they are nesting within the landholding.

## 4 SITE ASSESSMENT

During the breeding bird surveys undertaken at the Site, a total of 33 species were identified utilising the Site. During the wintering bird surveys, a total of eight species were recorded onsite and flying over the Site. Furthermore, during the building inspections, no evidence of nesting was recorded; however, barn owl were recorded commuting through and hunting over the Site.

### 4.1 Wintering Bird Site Assessment

The majority of the Site is comprised of agricultural grassland. The Site is also surrounded and bisected by a number of mature hedgerow / treelines.

Of the species recorded, in the I-WeBS data, at numbers of national importance, eight of these species have also been recorded by the NBDC within 2km of the Site within the 10 years – cormorant, curlew, golden plover, lapwing, little egret, shelduck, shoveler and teal [4]. It should be noted that only one of these species was observed during the wintering bird surveys – curlew. However, this species was noted flying over the Site and did not interact with it.

Curlew are designated under Cork Harbour SPA. This species typically winters in a wide range of wetland habitats (coastal and inland) and will also utilise wet grassland / damp fields as feeding habitat [17].

The Grange Hill River borders and intersects the Site. The Grange Hill River had a moderate flow and a depth of ca. 0.3m to 0.7m. The width is between 1-2m in sections, with a bank height ranging from 0.4m to 1.5m. The substrate was predominantly comprised of gravel and mud, and some cobbles. This river is not considered to be suitable for wintering wetland birds due to its small size and the fact that it is currently encroached by hedgerow / treelines and adjacent to agricultural grassland used for cattle grazing.

In addition, the fields in the northeastern portion of the Site were wetter in nature than those in the main portion of the Site. Although the agricultural grassland in the northeastern section of the Site does have the potential to provide suitable foraging habitat to wintering bird species, livestock were noted within this area throughout the year. As such, this has the potential to reduce the suitability of this habitat for wintering bird species. Livestock were not present in the fields during surveys, as the livestock had been moved for the duration of the surveys; however, evidence of livestock was noted through the fields, and the livestock were returned to the fields on completion of the surveys. The northeastern section of the Site extends into an area of wet grassland, which has the potential to support wintering birds. However, these fields are also grazed by cattle.

Overall, during the winter bird surveys undertaken at the Site, a total of eight bird species were recorded. These species were considered to be common species typically found in agricultural landscapes. Four red-listed species, curlew, kestrel, redwing and snipe, were recorded within the Site; however, the curlew were only noted flying over the Site while the kestrel, redwing and snipe were recorded in low abundances. Furthermore, during the surveys, there were no significant numbers of bird species utilising the Site, likely due to the agricultural uses of the Site and the presence of livestock within the Site. It should be noted that four of the bird species observed during the wintering bird surveys were flying over the Site and did not interact with the Site – buzzard, sparrowhawk, herring gull and curlew.

The only wetland / waterbird recorded onsite during the wintering bird surveys were snipe. Snipe were flushed on approach to VPs and during the transect survey carried out between VPs. Snipe were recorded in low numbers during each survey.

None of the species recorded were considered to be of International, National or County Importance, according to the receptor evaluation set out in Table 2-3. However, based on one

Amber-listed and four Red-listed species listed as possible breeding onsite, the Site can be concluded to be of Local Importance (High Value).

The Site provides suitable foraging habitat for countryside / farmland bird species; however, the Site is not considered to be a site of importance for any overwintering bird species. This conclusion is based on the fact that only low numbers of birds were recorded onsite and based on a review of aerial imagery, which shows that there are suitable foraging habitats present in the surrounding countryside.

In addition, wintering birds and wildfowl species tend to prefer habitats similar to those in Cork Harbour SPA, such as mudflats and salt marshes, none of which were located within the Site. The wet grasslands on-site may provide suitable habitat; however, as mentioned, the regular use by cattle means the habitats are considered suboptimal.

Therefore, it is concluded that the onsite habitats were not optimal for wintering bird species. Furthermore, suitable habitats within Cork Harbour are separated from the Site by Cork City and its suburbs, along with associated road infrastructure and agricultural fields.

#### 4.2 Breeding Bird Site Assessment

A total of 33 bird species were recorded onsite and of these species, 23 species displayed territorial behaviours that were classified as '*Possibly Breeding*' and 10 species identified onsite were classified as '*Non-breeding*.' These species were noted as possibly breeding based on their behaviours exhibited at the time of the surveys; however, breeding could not be confirmed in these species. However, no species were classified as '*Confirmed Breeding*' and no active or used nests were identified within the Site boundary.

None of the species recorded were considered to be of International, National or County Importance, according to the receptor evaluation set out in Table 2-3. However, based on three Amber-listed species listed as possible breeding onsite, the Site can be concluded to be of Local Importance (High Value).

The majority of the birds identified during the surveys were observed within the hedgerow / treelines for possible nesting and were observed foraging in the agricultural grassland. It should be noted that the majority of the hedgerow / treelines will be retained as part of the Proposed Development.

The hedgerow / treelines, scattered trees within the orchard, mixed broadleaved woodland and scrub areas located onsite and within the immediate surroundings of the Site are considered to provide suitable nesting and foraging habitat for breeding birds. These habitats are not exclusive to the Site and are common within the wider landscape. The majority of the hedgerow / treelines onsite will be retained and protected, and the scattered trees within the orchard will be retained as part of the Proposed Development. However, the areas of scrub will be removed, and some sections of the woodland area will be removed.

Additionally, it should be noted that the Site is located adjacent to the N22 National Road. As such, it can be concluded that the Site, which is located adjacent to this section of road, is subject to high levels of traffic noise emissions. Studies have shown that traffic noise can result in acoustic interference or masking of bird songs, which is a reduction in the distance over which bird songs can be detected by conspecifics [18]. Therefore, the masking of bird songs can make it more difficult for birds to establish and maintain their territories, attract potential mates, and maintain pair bonds, all of which can result in decreased breeding success [18]. Overall, it has been shown that bird abundance, occurrence and species richness are reduced near roads and have the largest reductions when traffic levels are high [19, 20].

Overall, the habitats onsite were considered to be suitable for a range of countryside bird species; however, no active nests or confirmed breeding were identified onsite. Furthermore, it is considered that the noise emissions from the N22 National Road reduce the suitability of

the Site for breeding bird species. Therefore, although the Site provides suitable habitat for breeding bird species, it is considered that the Site is not a site of importance for any breeding bird populations.

#### 4.3 Barn Owl Site Assessment

Barn owls were identified onsite in 2023 and 2024; however, no barn owl activity was noted in the 2025 surveys. The buildings and trees on-site were not considered suitable for breeding barn owls. Therefore, it is concluded that barn owls were not utilising the Site for breeding purposes. However, given the records of barn owl within 2km of the Site and sightings in 2023 and 2024, it is considered that barn owl may use the Site for commuting and foraging purposes.

## 5 ASSESSMENT OF POTENTIAL IMPACTS

### 5.1 Potential Impacts

This section will assess potential impacts, if any, on breeding and wintering bird species within the Site and the vicinity of the Site.

#### 5.1.1 Construction Phase

##### 5.1.1.1 Wintering Bird Species

It is not anticipated that the Proposed Development will have any significant impact on wintering birds in the vicinity of the Site, given the absence of any significant numbers of bird species recorded onsite and the ongoing agricultural activities onsite and within the vicinity of the Site. Therefore, it is considered that the Site is not a site of importance for any wintering or breeding bird species. It is anticipated that bird species would prefer areas with lower levels of disturbance away from the Site.

Whilst the Site is currently utilised by common countryside bird species and occasional water / wetland bird species, the numbers of these species that were recorded were low. Similarly, these species were noted moving into nearby fields to forage as well.

As birds are highly mobile species, it can be concluded that any species utilising the Site during the wintering season will move away to similar habitats to the north, east and south.

Therefore, no mitigation is considered necessary for wintering birds as part of the Proposed Development.

##### 5.1.1.2 Breeding Bird Species

As previously mentioned, the Site is considered to provide suitable nesting habitats for breeding birds through the hedgerow / treelines, scrub and mixed broadleaved woodland. In addition, the Site provides suitable foraging habitat through the agricultural grassland, scrub and hedgerow / treelines. Given the number of species recorded utilising the Site and amber-listed species, the Site is considered to be of local importance for breeding birds.

It is considered that a bird utilising the southern boundary of the Site would be habituated to high levels of anthropogenic noise, given the close proximity to the busy N22 road. However, it is still considered that birds within the Site and immediate locality may be subject to temporary disturbance during the construction phase of the Proposed Development. However, this is not considered likely to be significant, given that birds are highly mobile and therefore will move away from disturbances. It can be concluded that, should any birds be disrupted during any of the works, they will move to a suitable area elsewhere.

However, as part of the Proposed Development, the following clearance / removal works will be required:

- Removal of hedgerow / treeline in the northern and eastern sections of the Site and to facilitate the connection of the new roads;
- Removal of mixed broadleaved woodland; and,
- Removal of scrub vegetation.

For full details, please refer to the Landscape Plan prepared by Brady Shipman Martin ('BSM') submitted as part of this planning application.

However, in order to ensure no impacts occur to nesting birds during the removal works, mitigation measures will be required.

#### 5.1.1.3 Barn Owls

Barn owl are known to have high site fidelity to their breeding sites and territories through successive generations [9]. While the territory size of barn owls is dependent on the quality of habitat and abundance of prey, during the breeding season, most of the foraging typically occurs within ca. 1km of the nest [13]. However, it has been recorded in Ireland that barn owl can travel up to ca. 6km in search of food [14]. Barn owls are known to generally have favourite flight paths, perches and hunting patches, which are used routinely or even nightly [14]. It should be noted that during the winter season, barn owl may occupy nests within their territory [14].

Barn owls were identified onsite during the 2023 and 2024 surveys. It was concluded that barn owls are not using the Site for breeding purposes but use it for commuting and foraging. Therefore, it is considered that barn owls within the immediate vicinity of the Site may be subject to some temporary disturbance during construction; however, this is not considered likely to be significant. This conclusion is based on the fact that the Site is located adjacent to the busy N22, and the Site is currently subject to associated traffic noise emissions, and therefore, barn owl in the area are likely to be habituated to higher levels of anthropogenic noise emissions. Furthermore, given that no barn owl are nesting within the Site, it is considered that barn owl within the vicinity of the Site will move away from any disturbances. It can therefore be concluded that, should any birds be disrupted during any of the works, they will move to a suitable area elsewhere.

The Proposed Development will result in the loss of agricultural grassland and thus foraging habitat for barn owls in the vicinity of the Site. However, there are suitable habitats in close vicinity of the Site that can be utilised for commuting and foraging. Furthermore, barn owl were only identified on-site during two surveys and were there was no evidence of barn owl recorded during the 2025 surveys. Therefore, the potential loss of foraging habitat is not considered to be significant.

In addition, lighting will be included as part of the Proposed Development, and due to the fact that barn owl are a nocturnal species, in the absence of an appropriate lighting scheme this has the potential to impact on barn owl that may utilise the habitat within the vicinity of the Site.

#### 5.1.2 Operational Phase

It should be noted that bird were species observed flying over the Site during the surveys – buzzard, sparrowhawk, herring gull, barn owl, curlew, etc.

The Proposed Development will be comprised of five apartment buildings up to five-storeys, 638 two-storey houses and 104 two-story duplexes. The highest apartments will be up to ca. 18.5m tall.

The buildings located on-site comprise one- and two-storey buildings. The Gaelscoil Uí Ríordáin, located ca. 350m north of the Site, has ca. three-storeys. The Westfield Office Centre, located ca. 1.5km northwest of the Site, is ca. four to five-storeys tall. In addition, Ballincollig Town has multiple apartment blocks, ca. three-storeys tall. Therefore, it is considered unlikely that the Proposed Development will result in a significant collision risk to local bird species based on the fact that the majority of the buildings are of a similar height to those in the vicinity of the Site and the apartments will be similar in height to those in the locality.

Furthermore, the external building style and materials that will be utilised in the Proposed Development will be similar to those in the surrounding area (brick, windows, etc.). Therefore, the Proposed Development has been designed in order to reduce the potential risk of collision with local bird species.

In addition, the Site is surrounded and bisected by treelines, hedgerows and hedgerow / treelines. Following a review of the Tree Survey Report prepared by South of Ireland Tree Surveys and submitted in support of this application, trees within the hedgerow / treelines are up to 17m in height. Therefore, within the area, there are trees that are around a similar height to the tallest proposed apartments. Therefore, it is considered that there will be no proposed collision risk to birds within the area during the Operational Phase of the Proposed Development.

Although birds are known to sometimes aggregate around and occasionally collide with illuminated objects, the Proposed Development is located close to an urban environment and is in close proximity to illuminated residential properties, road and streetlights, with the busy N22 to the south of the Site. Overall, it is considered that the Proposed Development will not stand out in its landscape and thus not impact the flight patterns of birds flying over the Site.

Appropriate lighting mitigation measures will be implemented for nocturnal species, including barn owl. Therefore, no other mitigation measures are considered necessary for breeding or wintering birds during the Operational Phase.

Furthermore, enhancement measures for local bird species will be implemented as part of the Proposed Development, see Section 6.3 below.

## 6 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

### 6.1 Breeding Birds

#### Construction Phase

In order to ensure no impacts occur to breeding bird species, the following measures will be implemented:

- As per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches will be restricted during the nesting and breeding season for birds and wildlife, from 1<sup>st</sup> March to 31<sup>st</sup> August;
- In the event that works need to be undertaken within the main breeding season, the following measures will be implemented:
  - Prior to the works commencing, consultation with the NPWS will be undertaken by the Ecological Clerk of Works ('ECoW');
  - Prior to the vegetation removal, the ECoW will inspect the Site; and,
  - All vegetation clearance works will be undertaken in a systematic way under the direction of the ECoW.
- In the unlikely event birds nest within the active working area during the works, all works will stop within the immediate area and the project ECoW will be consulted; and,
- During the Construction Phase, annual breeding bird monitoring will be undertaken by the project ECoW to ensure no impacts occur to breeding birds within the vicinity of the Site.

#### Operational Phase

It is considered that there will be no impacts to breeding birds during the Operational Phase, and as such, no mitigation measures will be required.

### 6.2 Barn Owls

#### Construction Phase

In order to ensure no impacts occur to barn owl, the following mitigation measures will be implemented:

- Prior to vegetation removal or demolition of any onsite buildings, all trees and buildings to be removed will be assessed by the ECoW for the presence of barn owl;
  - If any barn owl signs are identified on Site, follow-up activity surveys must be carried out to establish the presence or absence of barn owl; and,
  - Should barn owl be identified utilising the Site, works will stop within the immediate area and consultation with the NPWS will be undertaken by the ECoW.
- Construction should be limited to daylight hours in order to minimise adverse effects on nocturnal fauna;
- Any construction lighting required will include the following:
  - Avoidance of excessive lighting;

- Light Emitting Diodes ('LED's') will be used, and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting should be turned down / off when not required;
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only where it is needed; and,
- The height of lighting columns should be reduced as much as possible, as lighting at a low level further reduces ecological impact.

### Operational Phase

During the Operational Phase, mitigation measures will be implemented in order to ensure no impacts occur to nocturnal species (including barn owl).

An external lighting installation assessment has been prepared by Kelliher's Electrical Ltd. for the Proposed Development and has been submitted as part of the overall planning application. This lighting plan has calculated the average and minimum illumination calculations for various areas of the Proposed Development, including the inner road, parking spaces and foot paths. This report concluded that the average illuminance calculated for the Proposed Development will be between 8.57lx ('Lux') and 7.85 Lux.

The following lighting measures will also be implemented as part of the lighting plan:

- Avoidance of excessive lighting;
- Light Emitting Diodes ('LED's') will be used, and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting should be turned down / off when not required;
- Lighting lux levels along retained trees will not exceed 1.0 Lux;
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only where it is needed;
- The height of lighting columns should be reduced as much as possible, as lighting at a low level further reduces ecological impact; and,
- Following the installation of the lighting for the Proposed Development, the project ECoW will undertake a further site inspection in order to check the lighting patterns and lux levels throughout the Site.

Overall, the lighting plan has been designed to ensure that no impacts occur to nocturnal species (including barn owl).

## **6.3 Enhancement Measures**

### **6.3.1 Landscaping Plan**

A comprehensive Landscape Plan has been prepared for the entire Site by BSM that aligns with the current landscape. For full details, refer to the Landscape Plan submitted as part of this planning application.

### **6.3.2 Bird Boxes**

A variety of bird nest boxes designed to attract a variety of nesting bird species will be erected on suitable trees within the Site. The creation of nesting habitat, along with the creation of

species-rich habitat will encourage an abundance of invertebrate life (a potential food source), which will be beneficial to local birds. General bird boxes designed to cater for a variety of species will be used, the number and location of which will be specified by an ecologist. Refer to the examples provided in Figure 6-1.

An example is the 1B Schwelger Nest Box - This nest box will attract a wide range of species and is available with different entrance hole sizes to prevent birds from competing with each other for the boxes.

Different bird species require different entrance sizes as outlined below:

- The circular 26mm entrance hole suits blue and coal tit, possibly wren and more. All other species are prevented from using the nest box due to the smaller entrance hole;
- The circular 32mm entrance hole will attract great, blue, and coal tit, nuthatch, flycatcher, tree and house sparrow;
- The 45mm entrance hole will attract starling; and,
- Open-fronted nest boxes will attract robins, wrens, pied and grey wagtail, song thrush and blackbirds.

The exact location of the bird boxes will be determined by an experienced ecologist after the completion of the proposed works. This is to allow the ecologist to assess the exact conditions that have been created and thus to ensure that the bird boxes are sited in the most appropriate location possible. However, it is recommended that bird boxes be facing between north and south-east to avoid strong winds, rain and sunshine. In addition, bird boxes should be tilted slightly forward to ensure that rain runs off the top, and there should be a clear flight path to access the nestbox hole. Also, bird boxes with a hole should be placed ca. 2-4m off the ground, whereas open-fronted bird boxes should be placed lower than 2m among dense vegetation where predators won't easily see it.

It should be noted that the distance between nest boxes can vary. Species such as house sparrow and starling have a preference for nesting in colonies and therefore the bird boxes should be placed closer to each other, whereas species robins and tits can be highly territorial and therefore the nest boxes should be separate by a greater distance.

**Figure 6-1: Bird Box Examples**



#### **6.3.2.1 House Martin Nesting Cups**

House martin nesting cups will be erected on suitable buildings throughout the Site – most likely commercial buildings that will not have overnight residents. The nesting cups will be installed underneath the eaves of the building, and a specialised sound system will play house martin calls in order to attract this species to the nest cups. The exact location of the bird

boxes will be determined by an experienced ecologist after the completion of the proposed works. See Figure 6-2 for house martin nest cup examples.

**Figure 6-2: House Martin Nest Cups**



## 7 CONCLUSIONS

Overall, 33 species were recorded during the breeding bird surveys, and eight species were recorded during the wintering bird surveys conducted on-site.

Of the 33 species that were recorded during the breeding bird surveys:

- 26 Green-listed BoCCI, non-annex species were recorded – blackbird, blackcap, blue tit, bullfinch, buzzard, chaffinch, chiffchaff, dunnock, feral pigeon, goldfinch, grasshopper warbler, great tit, grey heron, hooded crow, jackdaw, long-tailed tit, magpie, mistle thrush, pheasant, pied wagtail, robin, rook, song thrush, treecreeper, woodpigeon and wren;
- Seven Amber-listed BoCCI, non-annex species were recorded – goldcrest, greenfinch, house sparrow, mallard, starling, swallow and willow warbler; and,
- No Red-listed BoCCI, non-annex species were recorded.

During the surveys, no species were classified as '*Confirmed Breeding*', and no active nests were recorded within the Site.

Based on the breeding bird surveys, it was concluded that the hedgerow / treelines bordering and intersecting the Site are suitable for a range of common nesting bird species, and the agricultural grassland is suitable for foraging. The Proposed Development will require the removal of small sections of hedgerow / treeline, scrub and mixed broadleaved woodland and will be constructed on the agricultural grassland. However, appropriate mitigation measures will be implemented to ensure no impacts occur to breeding birds utilising the Site, and it is considered that the removal of these habitats will result in a short-medium term loss of nesting and foraging habitat. However, the landscape planning will provide additional foraging habitats once established, and the hedgerow / treelines can be utilised following completion of the works.

Two barn owls were observed utilising the Site in 2024. The barn owl surveys onsite did not identify any barn owl nests. It is considered that barn owls were using the Site for commuting and foraging purposes. Overall, it is considered that the Proposed Development will result in the loss of foraging habitat for barn owls; however, appropriate lighting mitigation measures will be implemented to not have a negative impact on barn owl commuting.

During the winter bird surveys, eight bird species were recorded:

- Three green-listed species – buzzard, fieldfare and sparrowhawk;
- One amber-listed species – herring gull; and,
- Four red-listed species – curlew, kestrel, redwing and snipe

Of the species recorded, one is a designated species under the Cork Harbour SPA – curlew. Additionally, under the EU Birds Directive, snipe are classified as an Annex II (Section I) & Annex III (Section III) bird species. However, this species was observed flying over the Site and did not interact with it.

The wintering bird surveys did not identify any roosting sites or potential roosting sites on the Site. It is considered that the Proposed Development will not have a negative impact on wintering birds, given that snipe were the only species to utilise the Site during wintering bird surveys. In addition, there are much more suitable habitat such as mudflats, salt marshes and wet grassland elsewhere.

Overall, it is concluded that the Site is not a site of importance for any breeding or wintering bird species, and following the implementation of appropriate mitigation measures, the Proposed Development will not result in any impacts to any breeding or wintering bird species.

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# CHAPTER FIFTEEN

## CULTURAL HERITAGE: ARCHAEOLOGICAL HERITAGE

- APPENDIX 15-1 Historic Mapping
- APPENDIX 15-2 Geophysical Survey Report
- APPENDIX 15-3 Archaeological Testing Report
- APPENDIX 15-4 Photos

**APPENDIX 15-1 Historic Mapping**

Cartographic Depictions of the Maglin Townland and Surrounding Area: Mid-17th to Mid-20th Century

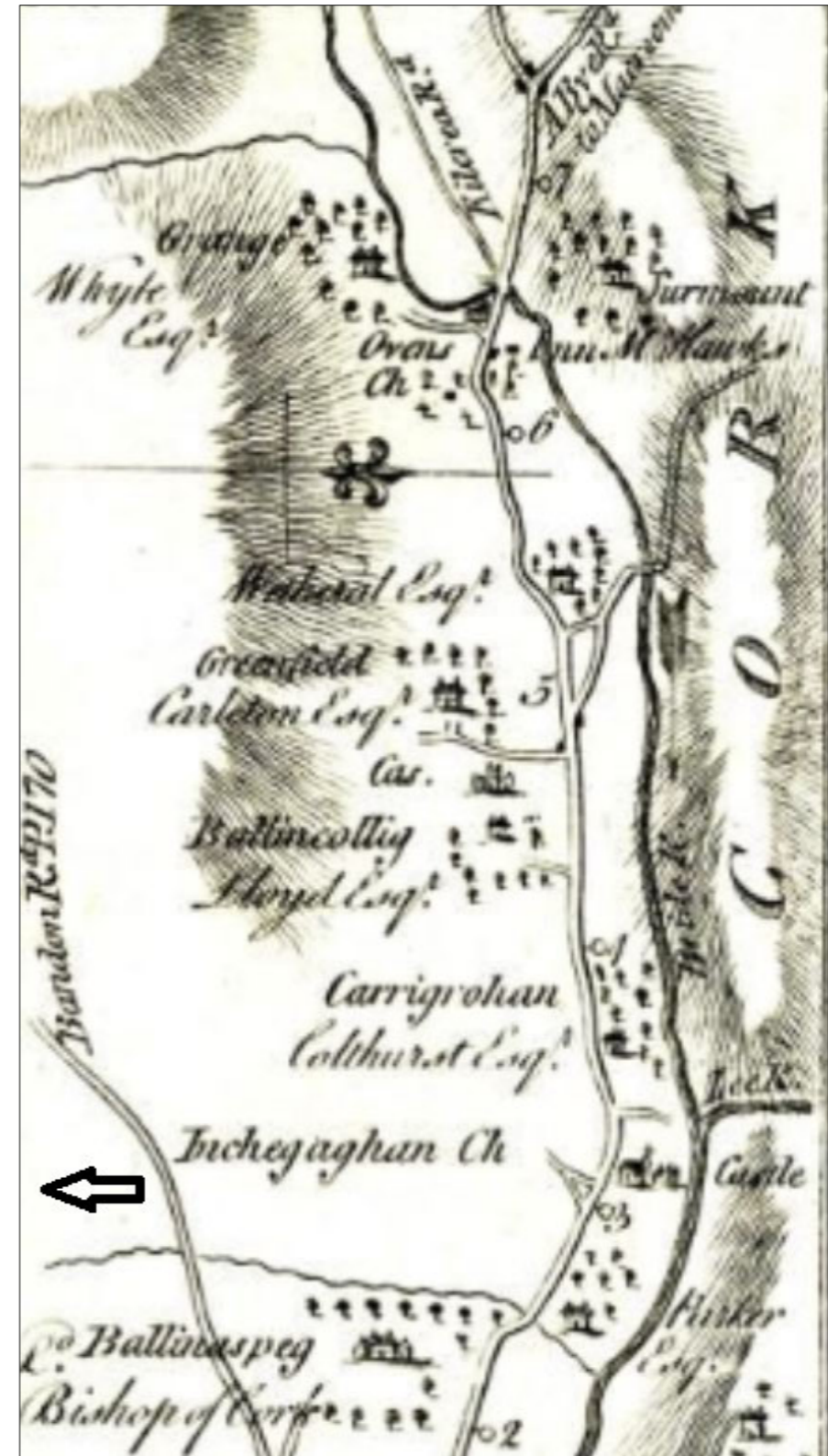


Figure 1: Down Survey (1656-1658) showing the townland of 'Maglen' to the southwest of 'Corke'  
<https://downsurvey.tchpc.tcd.ie/down-survey-maps.php#c=Cork>

Figure 2: Taylor and Skinner's Road Map (c.1777), sourced from [www.corkpastandpresent.ie](http://www.corkpastandpresent.ie) illustrates the principal route from Bishopstown (noted as Ballinaspeg) to Ovens. It identifies Key landowners of the time, including Colthurst Esq. of Carrigrohane, Loyd Esq. of Ballincollig, and Cardlon Esq. of Greenfield. The map reflects the estate-based landholding system typical of late 18th-century Ireland.



Figure 3: Neville Bath's 1811 Grand Jury map ([www.corkpastandpresent.ie](http://www.corkpastandpresent.ie)) depicts the townland of Maglin, highlighting several large country houses. Also shown are Ballincollig Castle and the gunpowder mills along the River Lee.



**Figure 4:** OS 6-inch map (1841) with proposed development site outlined, illustrating the rural character of the Maglin area in the mid-19th century. The map highlights a landscape of dispersed farmsteads, field boundaries, and limited infrastructure, reflective of an agrarian society (Source: [www.archaeology.ie](http://www.archaeology.ie))

**APPENDIX 15-2 Geophysical Survey Report**

Geophysical Survey Report  
**Proposed residential development in  
 Ballynora & Maglin townlands, Co. Cork**

Client  
**O'Flynn Group**

Detection License  
**24R0002**

TAG Project  
**2024IE01**

Date  
**February 2024**

Author  
**John Nicholls MSc.**



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200 Kimmage Road West, Dublin 12

**TARGET GEOPHYSICAL SURVEY REPORT 2024IE01  
 PROPOSED RESIDENTIAL DEVELOPMENT IN BALLYNORA & MAGLIN TOWNLANDS, CO. CORK**

**PROJECT BACKGROUND**

Target Archaeological Geophysics Ltd. was appointed by O'Flynn Group to undertake a geophysical survey at the site of a proposed residential development in the townlands of Ballynora and Maglin, c.1.5km S-SE of Ballincollig, in Co. Cork. Bound to the S and W by the Cork South Ring Road (N40) and Maglin Road, the proposed development encompasses c.29ha of agricultural land sub-divided in to 9 adjacent fields. Geophysical survey completed a total 18.09ha of high-resolution recorded magnetometry within the proposed development boundary, examining all lands suitable at the time of investigation.

This work was carried out as part of a pre-planning archaeological assessment being undertaken on behalf of the client by Lane Purcell Archaeology. The geophysical survey was conducted under license from the National Monuments Service, Department of Housing, Local Government & Heritage with the following aims (detection license 24R0002):

- to identify geophysical anomalies of possible archaeological origin within the investigation area
- accurately locate these anomalies and present the findings in graphical format
- describe the anomalies and discuss their likely provenance in a written report

**ITM central coordinates:** 559885 569306

**Townlands:** Ballynora, Maglin

**County:** Cork

**Landuse:** Good quality pasture land and machine levelled terrain

**Landscape, soils, geology**

The proposed development occupies improved pasture land descending gently to the S-SW, with elevated machine levelled terrain to the E deriving from construction of the N22/N40. Soils typical of the locality consist of Clashmore (1100n) association brown earths overlying glacial till and gravels derived from Devonian sandstones. Bedrock is characterised by Waulsortian mudbank and pale-grey massive limestone to the N and Marine (Cork Group) mudstone, sandstone and thin limestone to the S (Irish National Soils Map, 1:250,000k, V1b, 2014; Geological Survey of Ireland Spatial Resources, Public Data Viewer Series).

**Archaeology**

RMP site CO073-065 (fulacht fia) and CO073-097 (country house) are located within the boundary of the proposed development. Lime kiln CO073-064 and the site of fulacht fia CO073-130, the latter excavated prior to construction of the Cork South Ring Road, are also located shortly beyond the proposed development boundary to the N and S. Numerous further recorded monuments and places are located within the surrounding landscape. The following extract from the National Monuments Service SMR database provides summary details of all RMPs situated within a 1km radius of the proposed development:

SMR No.	Townland	ITM East	ITM	Monument Class
CO073-062001	Ballincollig (Muskerry East By., Carrigrohane Par.)	558702	569850	Bawn
CO073-062	Ballincollig (Muskerry East By., Carrigrohane Par.)	558711	569853	Castle - Tower House
CO073-063	Ballynora, Maglin	559431	568921	Bridge
CO073-064	Maglin	559792	569495	Kiln - Lime
CO073-065	Maglin	560195	569271	Fulacht Fia
CO073-074	Ballincollig (Muskerry East By., Carrigrohane Par.)	559060	570180	Standing Stone
CO073-101	Maglin	559783	569952	Fulacht Fia
CO073-097	Maglin	559774	569301	Country House
CO073-100	Maglin	559894	569743	Fulacht Fia

CO073-103	Carrigrohane	559897	569918	Standing Stone
CO073-104	Carrigrohane	560640	569823	Fulacht Fia
CO085-028	Maglin	559095	568703	Ringfort - Rath
CO085-029	Ballynora	559739	568772	Quarry
CO085-030	Ballynora	559652	568421	Enclosure
CO085-031	Ballynora	560752	568442	Ritual Site - Holy Well
CO085-127	Maglin	559320	568828	Fulacht Fia
CO085-136	Ballynora	560110	568769	Church
CO085-136001	Ballynora	560110	568769	Graveyard
CO073-130	Maglin	559879	569145	Fulacht Fia
CO073-131	Maglin	558855	569164	Fulacht Fia
CO073-136	Curraheen (Cork By., Inishkenny Par.)	560666	569466	Fulacht Fia
CO073-132	Carrigrohane	560579	570285	Excavation – Misc.
CO073-134	Curraheen (Cork By., Inishkenny Par.)	560681	569291	Fulacht Fia
CO073-135	Curraheen (Cork By., Inishkenny Par.)	560654	569532	Fulacht Fia
CO073-137	Curraheen (Cork By., Inishkenny Par.)	560815	569368	Burnt Mound
CO073-138	Curraheen (Cork By., Inishkenny Par.)	560830	569370	Excavation - Miscellaneous
CO073-139	Curraheen (Cork By., Inishkenny Par.)	560840	569391	Fulacht Fia
CO073-140	Curraheen (Cork By., Inishkenny Par.)	560863	569385	Burnt Mound
CO073-141	Curraheen (Cork By., Inishkenny Par.)	560881	569423	Fulacht Fia
CO073-142	Curraheen (Cork By., Inishkenny Par.)	560919	569421	Fulacht Fia
CO073-143	Curraheen (Cork By., Inishkenny Par.)	560844	569373	Fulacht Fia
CO073-146	Curraheen (Cork By., Inishkenny Par.)	560681	569291	Habitation Site
CO073-062002	Ballincollig (Muskerry East By., Carrigrohane Par.)	558716	569874	Cave
CO073-150	Carrigrohane	560433	570092	Enclosure
CO073-161	Ballincollig (Muskerry East By., Carrigrohane Par.)	559285	569850	Burnt Spread

<b>Fieldwork period</b>	15 <sup>th</sup> – 17 <sup>th</sup> January 2024
<b>Geophysical technique</b>	High-resolution recorded magnetometry (fluxgate gradiometry)
<b>Report issue date</b>	13 <sup>th</sup> February 2024
<b>Author</b>	John Nicholls MSc.
<b>Detection license no.</b>	24R0002
<b>Client</b>	O'Flynn Group
<b>Archaeologists</b>	Lane Purcell Archaeology

## 1 SURVEY METHODOLOGY

### 1.1 Methodology

1.1.1 Geophysical survey by high-resolution recorded magnetometry was conducted in 8 areas (M1-M8) within the site of the proposed development, investigating 18.09ha of available land within a site boundary encompassing c.29ha.

1.1.2 The geophysical investigation employed an advanced multichannel fluxgate gradiometer system combined with cm precision GPS, recording magnetometer (fluxgate gradiometer) and GPS data simultaneously at rates of 50Hz and 1Hz. The geophysical data were acquired along parallel instrument traverses 3.64m in width, the instrumentation installed in 'tow configuration' for use with an ATV.

### 1.2 Instrumentation

1.2.1 The following table provides a summary of the survey methodology and geophysical instrumentation employed during the course of this work:

Technique	Sensor spacing	Sample rate	Instrumentation	Sensitivity/precision	No. of data recorded
Magnetometry (fluxgate gradiometry)	0.28m	50Hz	Multi-channel fluxgate gradiometer	<75pT/vHz @ 1Hz (650mm baseline)	806,698
GPS	3.92m	1Hz	Trimble R10 (VRS)	<0.1m	20,350

1.2.2 The instrumentation and software employed for this geophysical survey were configured to apply a spatial resolution of c.80 magnetometer measurements per m<sup>2</sup>. This spatial resolution meets with ease the 'Level 3 – Characterisation' EAC Guidelines for geophysical survey in archaeology (Schmidt et al, 2016).

### 1.3 Data processing

1.3.1 Post-fieldwork geophysical survey data processing was undertaken as follows:

Process	Description
i	Positioning of geophysical data based on real-time GPS measurements (WGS84 Geodetic CRS)
ii	Zero median transect processing for multi-sensor magnetometer data collected along parallel transects
iii	Transformation from WGS84 geodetic coordinate system to ITM (IRENET95) projected CRS
iv	Gridding (ordinary kriging)
v	Export of greyscale images georeferenced in ITM (IRENET95) projected CRS

1.3.2 To maintain the integrity of the processed geophysical data, and its correlation with the original raw on-site measurements, no further processing, filtering or 'smoothing' of the data was undertaken following steps i-v.

### 1.4 Data display

1.4.1 Figure 1 presents a site location diagram (scale 1:12,500), highlighting the site of the proposed development to the S of Ballincollig, N of the Cork South Ring Road and E of Maglin Road, with RMPs in a 1km radius indicated.

1.4.2 Figure 2 presents a summary greyscale of the results from geophysical survey in M1-M8 at a scale of 1:3000, with 1:1500 scale greyscales of the results presented in figures 3-4.

1.4.3 Figure 5 presents a summary interpretation of the results from geophysical survey in M1-M8 at a scale of 1:3000, with 1:1500 scale interpretation diagrams presented in figures 6-7.

## 2 GENERAL CONSIDERATIONS

### 2.1 Ground conditions & access

2.1.1 The geophysical survey focused mainly on 7 good quality pasture fields occupying the central and western portions of the proposed development. Examination of the eastern portion of the proposed development was limited to 1 small machine levelled field bordering the South Ring, excluding a much larger adjacent field situated between M6-M8 where the ground surface was exceptionally poor. Survey was also precluded by an untethered dog amongst private dwellings to the NW, dense vegetation and trees immediately S-SE of CO073-097, and flooding to the E in M7.

2.1.2 The following table details the conditions of the terrain investigated during the course of this geophysical survey, and the hectares of geophysical survey completed within the site boundary:

Areas	Conditions of the terrain	Ha
M1	Gently undulating good quality pasture field N of farm access and E of Maglin Road, sub-divided by post and wire fencing to the S, with private dwellings to NW & SW.	2.02
M2	Low-lying good quality pasture S of farm access, E of Maglin Road, N of South Ring.	2.21
M3	Gently undulating good quality pasture field bordering CO073-097, situated N of farm access.	3.16
M4	Small S facing good quality pasture field S-SW of CO073-097.	0.22
M5	Gently undulating good quality pasture field NE-E of CO073-097, situated N of farm access.	3.16
M6	Gently undulating generally good quality pasture field with impeded drainage from field centre to E.	2.63
M7	Large low-lying good quality pasture field immediately N of South Ring & S of farm access, with flooding to E.	3.78
M8	Poor quality S-SE facing small pasture field bordering South Ring, with impeded drainage at the southern/south-eastern perimeter.	0.91

### 2.2 Modern interference

2.2.1 The results from geophysical survey in M1-M7 display an abundance of small-scale ferrous throughout. These are a common occurrence in magnetometer data and relate mostly to modern metallic debris in the topsoil.

2.2.2 Broad ferrous responses are also evident in the results, the majority at the perimeter of survey in proximity to existing field boundaries and modern surfaces, most notably at the perimeter of CO073-097 to the E-SE in M3 and W-SW in M5.

2.2.3 Large-scale magnetic disturbance and modern ferrous recorded N and SE of CO073-097 in M3 and M5 corresponds to an area of limestone outcropping depicted on historic mapping and a pond referred to as Lough Boy. The results from M8 similarly demonstrate widespread magnetic disturbance likely deriving from groundworks associated with construction of the South Ring. Subtle magnetic contrasts of archaeological interest, if present in proximity to these areas of modern disturbance, will not be visible in the geophysical data due to the range of interference encountered.

### 2.3 Recent landuse & cultivation

2.3.1 Responses associated with former boundaries are indicated by the results from survey in M3 and M7. Remnants of former cultivation are also evident in the results from M1-M3 and M5-M7, visible as closely spaced parallel linear responses on various alignments.

2.3.2 The survey data also highlight a buried service traversing M1 and M3 S of centre roughly E-W.

### 2.4 Natural soil/geological variation

2.4.1 Weakly positive/negative fluctuations in response indicative of natural soil/geological variation have also been recorded by the geophysical survey, and these are particularly abundant in M2 and M7.

## 3 GEOPHYSICAL SURVEY RESULTS

### 3.1 General overview

3.1.1 The results from geophysical survey in M1-M7 across the available land within the site boundary demonstrate a generally quiet magnetic background which is generally within a range of +/-1.5nT. Fluctuations above background variations derive mostly from effects of recent landuse, natural soil geological variation, modern ferrous and magnetic disturbance..

3.1.2 No geophysical anomalies of definitive archaeological character have been recorded within M1-M8. Responses of potential archaeological significance are, however, present in the geophysical data, the most notable of these visible as curvilinear positives suggesting potential enclosure remains to the S and SE in M3 and M5. The exact significance of these responses remains uncertain as they are located at the perimeter of survey and display mostly weak magnetic signatures < 2nT in magnitude. The possibility that these responses derive from recent landuse, natural soil/geological variation and/or modern ferrous should be considered.

3.1.3 The results from geophysical survey in M1-M7 also highlight numerous small-scale positives, poorly defined linear anomalies and trends of questionable significance. Where no immediate archaeological context is apparent in the data these anomalies are deemed to be of limited interest and expected to derive from effects of recent landuse, natural soil/geological variation and/or modern ferrous.

### 3.2 Survey results (figures 2-7)

3.2.1 The following table discusses the results from geophysical survey in M1-M8 within the available lands investigated at the site of proposed development:

Discussion of survey results from M1-M8			
Area	Anomaly(s)	Location	Description & likely provenance
M1	1	S	Linear/curvilinear trends of uncertain origin. The possibility that 1 represent weakly magnetic buried features of significance should not be dismissed. A recent landuse and/or natural soil/geological origin should also be considered.
M2	2-4	NW, SW, N of centre	Connecting trends and discrete positives of uncertain origin. Responses 3-4 occur within an increase in the magnetic background deriving from former cultivation and natural soil/geological variation. An archaeological origin for 2-4 is deemed unlikely.
M3	5	S	Weakly positive curvilinear ditch type response c.30m in diameter potentially highlighting remnants of a levelled enclosure, with traces of faint linear anomalies at the interior. An archaeological interpretation for 5 remains tentative given this anomaly's limited magnetic signature and its location at the limits of survey.
M3	6-7	SW	Discrete small-scale positives and trends of uncertain origin recorded at western perimeter of response 5. The significance of 6-7 remains uncertain given their weak magnetic signature. A recent landuse, natural soil/geological explanation and/or modern ferrous origin should also be considered.
M3	8	NW of centre	Cluster of small-scale positives of uncertain origin. A natural soil/geological and/or modern ferrous origin is deemed most likely.
M4	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M4. The results from this investigation area highlight broad modern ferrous N-NE, with weak trends of limited potential and natural/soil geological variation also evident.
M5	9	SE	Weakly positive curvilinear ditch type response potentially highlighting remnants of a levelled enclosure. An archaeological interpretation remains tentative given this anomaly's limited magnetic signature and its location at the limits of survey.

M5	10-11	SE	Pattern of weakly positive linear responses indicating remnants of a possible early field system. Interpretation remains tentative and a recent landuse and/or natural soil/geological origin should also be considered.
M5	12	SW	Rectilinear trend and positive response uncertain in origin recorded at perimeter of large-scale modern ferrous corresponding to location of infilled pond referred to on historic mapping as Lough Boy.
M6	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M6. The results from this investigation area highlight small-scale positives of limited significance to the N-NW and SW, and weak linear/curvilinear trends indicative of natural/soil geological variation.
M7	13	N	Curving linear trends potentially forming the southern perimeter of a possible levelled enclosure recorded to the SE in M5. Interpretation remains highly tentative: these anomalies are at the limits of detection, barely visible above background variation, and a recent landuse and/or natural soil/geological explanation should also be considered.
M7	14-17	Centre, S, SW, NE	Poorly defined positives and weak trends of uncertain origin. The significance of 14-17 remains highly tentative and a recent landuse, natural/soil and/or modern ferrous origin is expected.
M8	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M8. Widespread strong magnetic disturbance occurs throughout, this likely resulting from ground works connected with construction of the Southern Ring. Where features of archaeological significance may be present in M8 they will remain undetected due to the range of modern interference encountered.

#### 4 CONCLUSION

- 4.1 No responses of definite archaeological character have been recorded by the geophysical in the available lands investigated within the proposed development boundary. Curving ditch type responses, which may represent levelled enclosure remains, have been identified to the S in M3 and to the SE in M5. A possible early field system is also indicated to the E-SE in M5. The exact origin of these anomalies remains uncertain, and can only be confirmed by archaeological testing.
- 4.2 Less distinct responses of uncertain origin have also been recorded by the geophysical survey. The most notable of these include weak linear trends to the S in M1 and NW in M2; small-scale positives and linear trends to the S-SW in M3, SE in M5 and N in M7. The possibility that these anomalies may represent relics of recent landuse, natural soil/geological variation and/or modern ferrous should not be ignored.
- 4.3 The geophysical data from M1-M7 highlight small-scale positives and trends of uncertain origin, remnants of former field boundaries and past cultivation, natural soil/geological variation, modern ferrous and magnetic disturbance and a buried service. Extensive magnetic disturbance occurs throughout the results from M8.
- 4.4 It should be noted that where high levels of magnetic disturbance and ferrous response are apparent in the geophysical data archaeological features, if present in these locations, will remain undetected. Given the poor quality of the terrain in the eastern portion of the proposed development it was not possible to confirm the presence of any remains associated with fulacht fia site CO073-065.

#### BIBLIOGRAPHY

- QGIS Development Team, 2023, QGIS Geographic Information System, Open-Source Geospatial Foundation Project <http://qgis.osgeo.org>.
- Schmidt A, (2002), Archaeology Data Service. Geophysical Data in Archaeology. A guide to good practice.
- Schmidt A, Linford P, Linford N, David A, Gaffney C, Sarris A, and Fassbinder J, (2016), EAC Guidelines for the Use of Geophysics in Archaeology.

#### ONLINE RESOURCES

- Archaeological Survey of Ireland SMR Database:  
<https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=0c9eb9575b544081b0d296436d8f60f8>
- Bing Maps: <https://www.bing.com/maps>
- Geological Survey of Ireland Spatial Resources, Public Data Viewer Series:  
<https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228>
- Google Maps: <https://www.google.com/maps>
- Geohive Mapviewer: <http://www.geohive.ie>
- Irish National Soils Map, 1:250,000k, V1b (2014). Teagasc, Cranfield University (jointly funded by the EPA STRIVE Research Programme 2007-2013 & Teagasc): <http://gis.teagasc.ie/soils/map.php>

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Fig. 6	Interpretation 1	1:1500
Fig. 7	Interpretation 2	1:1500

**APPENDIX**

Technical information: magnetometry

**MAGNETOMETRY****Introduction**

Magnetometry represents one of a suite of geophysical techniques employed in archaeological prospection to inform invasive work such as trial trenching and excavation.

Frequently used to determine the often non-visible boundaries of archaeological remains, magnetometer surveys enable archaeologists to identify the location, form and extent of a diverse array of archaeological features no longer visible at the surface.

Buried archaeological remains successfully identified using magnetometry include sites such as enclosure systems and deserted villages, hillforts and military encampments, henges and tumuli, villa/castle foundations, ecclesiastical settlements and formal gardens.

**Background to application**

The basis for use of magnetometry in archaeological prospection derives from the abundance of natural iron oxides in most soils, and our ability to measure subtle variations in the magnetic properties of these iron oxides caused by human activity. Discrete variations in soil magnetism associated with buried archaeological remains derive typically from in situ burning and organic enrichment of the soil, through activities such as cooking and heating; pottery manufacture and metal working; as well as use of fired building materials such as ceramic tiles and brick. These burnt, fired and organic rich deposits create subtle magnetic contrasts visible as discrete magnetic anomalies superimposed on the earth's geomagnetic field.



1. Magnetometer survey data in greyscale format highlighting pit remains SE of an enclosure and Roman villa. 2. Burnt-fired debris uncovered during excavation of the highlighted area SE of the same enclosure and Roman villa.

Magnetometer surveys conducted in both commercial and research archaeological investigations enable determination of the location, form and extent of buried archaeological remains. Data acquired from these surveys can be quickly generated into georeferenced images and interpretation layers to inform subsequent trial trenching and excavation.

**Technology**

TARGET provides precise mapping and characterization of buried archaeological remains by employing an array of highly stable and sensitive fluxgate gradiometers, combined with an advanced data logging system and cm precision GPS. This state-of-the-art geophysical instrumentation, which is capable of collecting extremely dense data sets, permits detailed high-resolution survey of archaeological sites from as small as 1ha in size, to larger scale investigation of sites up to 150ha or more.

High resolution magnetometer surveys are undertaken as standard, recording data at c.5cm intervals with probe separations of 0.3m for precise measurement and characterization of buried archaeological remains. This spatial resolution meets with ease the 'Level 3 – Characterisation' EAC Guidelines recommendation for geophysical survey in archaeology (Schmidt et al, 2016).

Instrumentation is used in combination with cm precision GPS and data collected along parallel traverses with the system installed in 'tow configuration' for use with an ATV or in push mode.

### Data Display

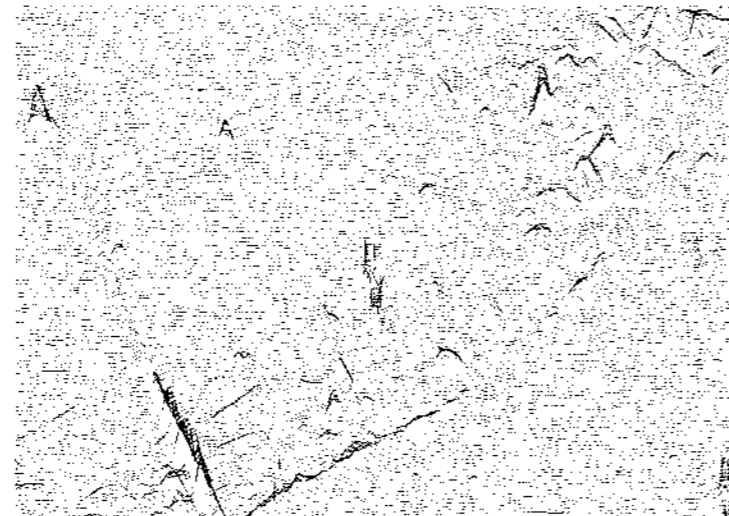
*Greyscale* plots are the most common format for displaying magnetometer data. This display format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within a given data set. This display method also enables the identification of discrete responses barely visible above natural 'background' magnetic variation on site.

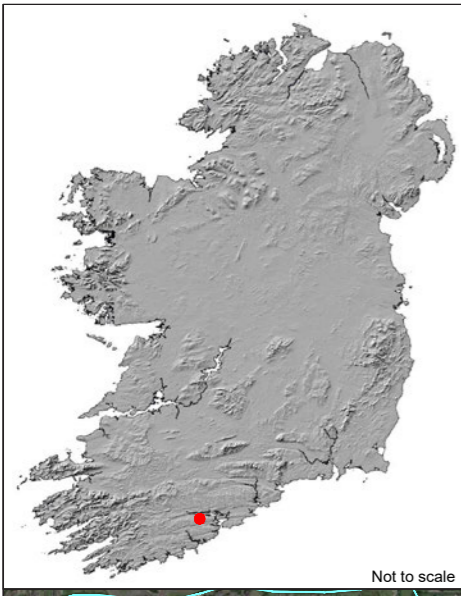
6. Greyscale from survey at the site of a deserted medieval village.



*XY trace* plots provide a near-perspective representation of measurements along individual lines of data recorded from each magnetometer sensor. The XY trace format is used as a conventional method for identifying responses of modern ferrous debris, and also as an aid in identifying locations of potential industrial features, such as kilns and metal working.

7. XY trace from survey at the site of a deserted medieval village.



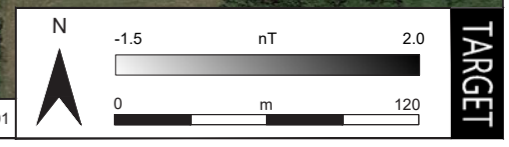


Not to scale

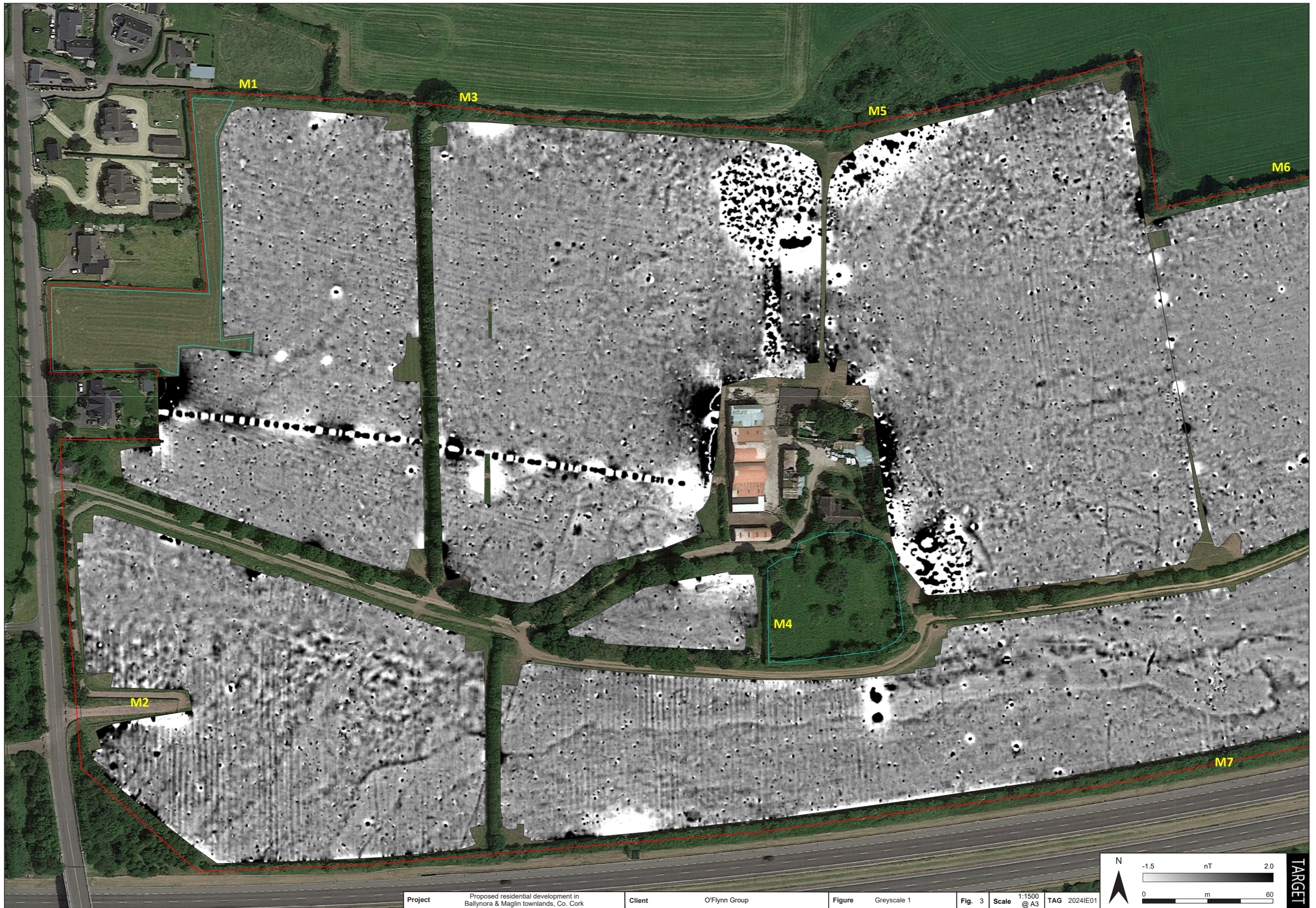
- Site location
  - - - 1km radius from site boundary
  - SMR Zone & National Monument
  - Townland boundary
- Aerial imagery © Google & Maxar Technologies 2023



Site location  
Unsuitable to geophysical survey



TARGET





M6

M8

M7





- ? Archaeology
- Anomaly of uncertain origin
- Trend
- - - Former boundary (historic mapping)
- - - Former field or cultivation boundary (absent on historic mapping)
- - - Cultivation
- Natural soil/geological variation
- Response from buried service
- Ferrous
- Magnetic disturbance





**APPENDIX 15-3 Archaeological Testing Report**

**Abstract**

The proposed development site is located at Maglin and Ballynora, Ballincollig, Cork. It is proposed to construct a Largescale Residential Development on the site. There are two recorded archaeological sites within the proposed development site, a fulacht fia (CO073-065) and a country house (CO073-097).

A pre-planning geophysical survey of the proposed development site found no responses of definite archaeological character. Two curving ditch type responses of potential archaeological significance (Anomalies 5 and 9) were identified and considered to possibly represent the remains of two levelled enclosures. A third semicircular anomaly (Anomaly 13) was also identified as being possibly of some archaeological significance.

Pre-development archaeological testing of the anomalies was carried out to inform the development layout. Each of the three anomalies were investigated. Nine trenches were excavated in total (three to each anomaly) and the presence of two enclosures was verified. The third anomaly was found to be of no archaeological value. The development has been designed to facilitate the preservation *in situ* of the enclosures.

**Archaeological Testing  
Maglin, Ballincollig, Cork**

Licence Number 24E0723

Avril Purcell MA MIAI & Musetta O’Leary MA  
February 2025

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Lane Purcell Archaeology,  
64 Fr Mathew Road,  
Turner’s Cross,  
Cork

Job Ref. LPA1245

on behalf of  
O’Flynn Construction,  
Beckett House,  
Barrack Square,  
Ballincollig,  
Cork

## 1 Introduction

1.1 It is proposed to construct a Large-scale Residential Development (LRD) in the townlands of Maglin and Ballynora, Ballincollig, Cork (ITM 559807 569339) (Figs. 1 and 2). The majority of the proposed development site lies in Maglin with a small portion to the southeast in Ballynora.

1.2 There are two recorded archaeological sites within the proposed development site, a fulacht fia (CO073-065) and a country house (CO073-097) - Maglin House (Fig. 3).

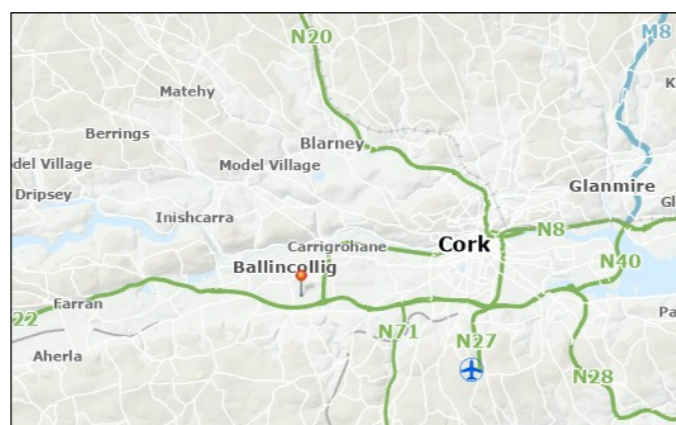


Figure 1: Ordnance Survey location map

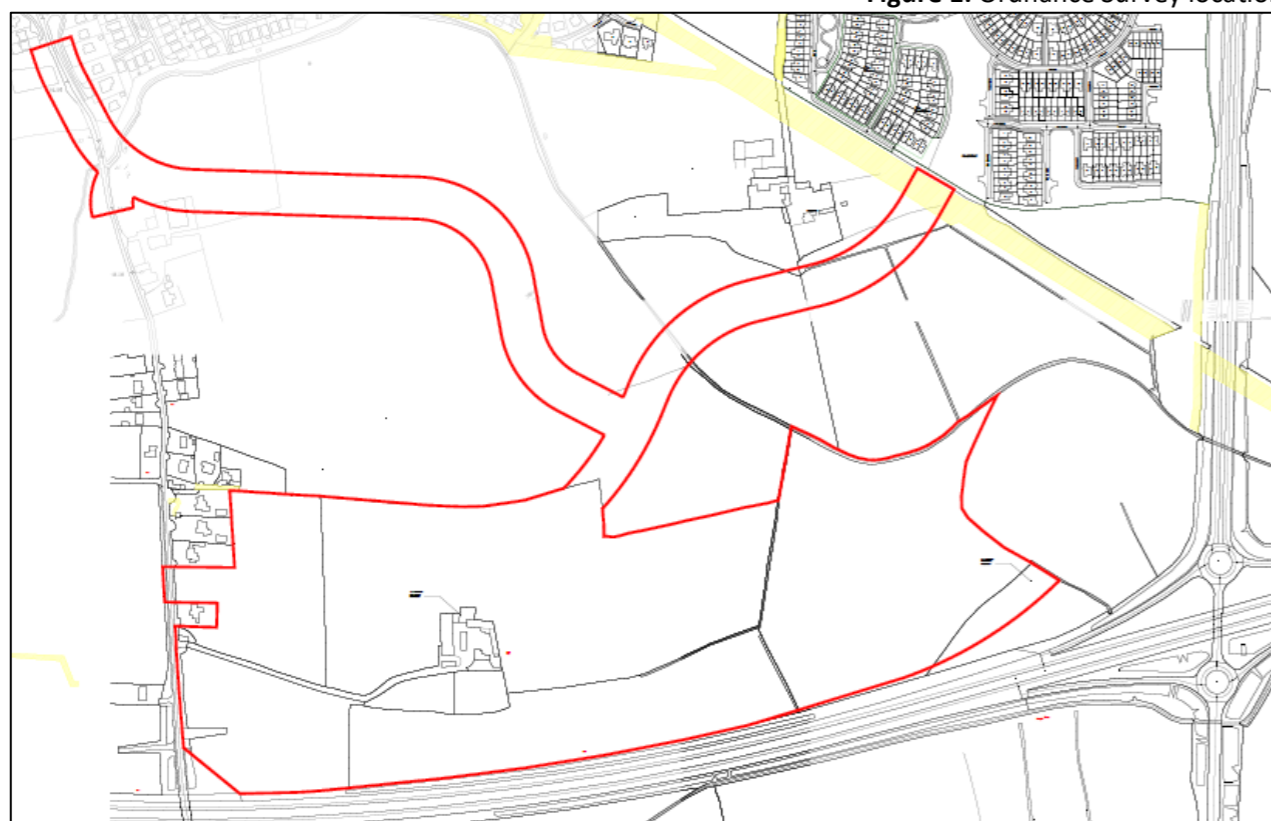


Figure 2: OSI location map (1:1,000 reduced)

1.3 The proposed development site, comprising seven pasture fields (M1-M7) and a portion of an eighth (M8), is centred around Maglin House. A pre-planning geophysical survey of the proposed development site was undertaken in February 2024 under licence 24R0002 (Nicholls 2024). No responses of definite archaeological character were recorded in the survey, however, two curving ditch-type responses of potential archaeological significance were noted and considered to possibly represent two levelled enclosures while a third response was considered to be of lesser potential.

1.4 Subsequent to the geophysical survey consultation was undertaken with Ciara Brett, Cork City Archaeological and a programme of archaeological testing was agreed to calibrate the results of the survey in the areas of the potentially significant archaeological anomalies and to inform the layout of the proposed development.

1.5 Archaeological testing was carried out in August 2024 under licence 24E0723. Nine trenches were opened in the area of the three anomalies and ditches of two circular enclosures were identified along with possible

slot trenches and a possible posthole. The proposed development has been designed to retain the archaeological features *in situ* (Fig. 4).

1.6 This report was compiled by Avril Purcell, Lane Purcell Archaeology, 64 Fr Mathew Road, Turner's Cross, Cork on behalf of O'Flynn Construction, Beckett House, Barrack Square, Ballincollig, Cork.



Figure 3: Extract from OSI aerial 2011-2013 MapGenie Digital showing proposed development site ([www.archaeology.ie](http://www.archaeology.ie))

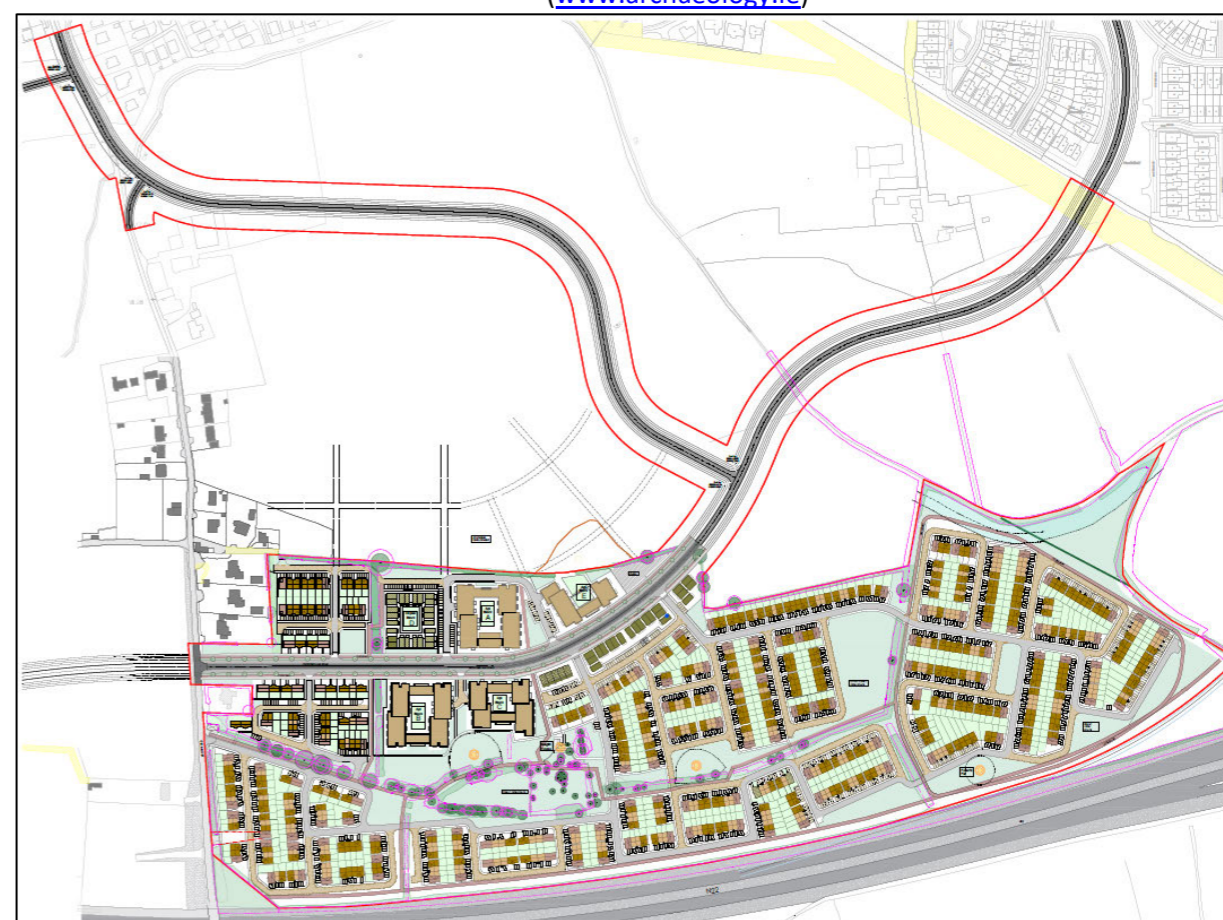


Figure 4: Proposed development layout (after Wilson Architecture)

## 2 Archaeological and Historical Background

2.1 The larger part of the proposed development site is located in the townland of Maglin, in the parish of Saint Nicolas and barony of Muskerry East, while the southeastern corner lies in the townland of Ballynora, parish of Kilnaglory and barony of Cork. The proposed development site lies approximately 1km to the south of Ballincollig town, on the north side of the N22. There are two recorded archaeological sites within the proposed development site – a fulacht fia (CO073-065) and a country house (CO073-097) – Maglin House. Both are included in the Archaeological Inventory of Co Cork (Power *et al.* 1997) as follows:

*CO073-065 In reclaimed pasture, to N of stream. Shown on 1939 OS 6-inch map as mound. Spread of burnt material noted.*

*CO073-097 Late 18th/early 19th-century 2-storey L-shaped house. Front elevation (S) of 4 bays, off-centre porch entrance; Wyatt windows in side bay to W, remainder sash windows. Gabled addition to rear on W side makes ground plan L-shaped. Shallow central gabled stairway projection to rear. Farm buildings and cobbled yard to rear. Walled garden to S.*

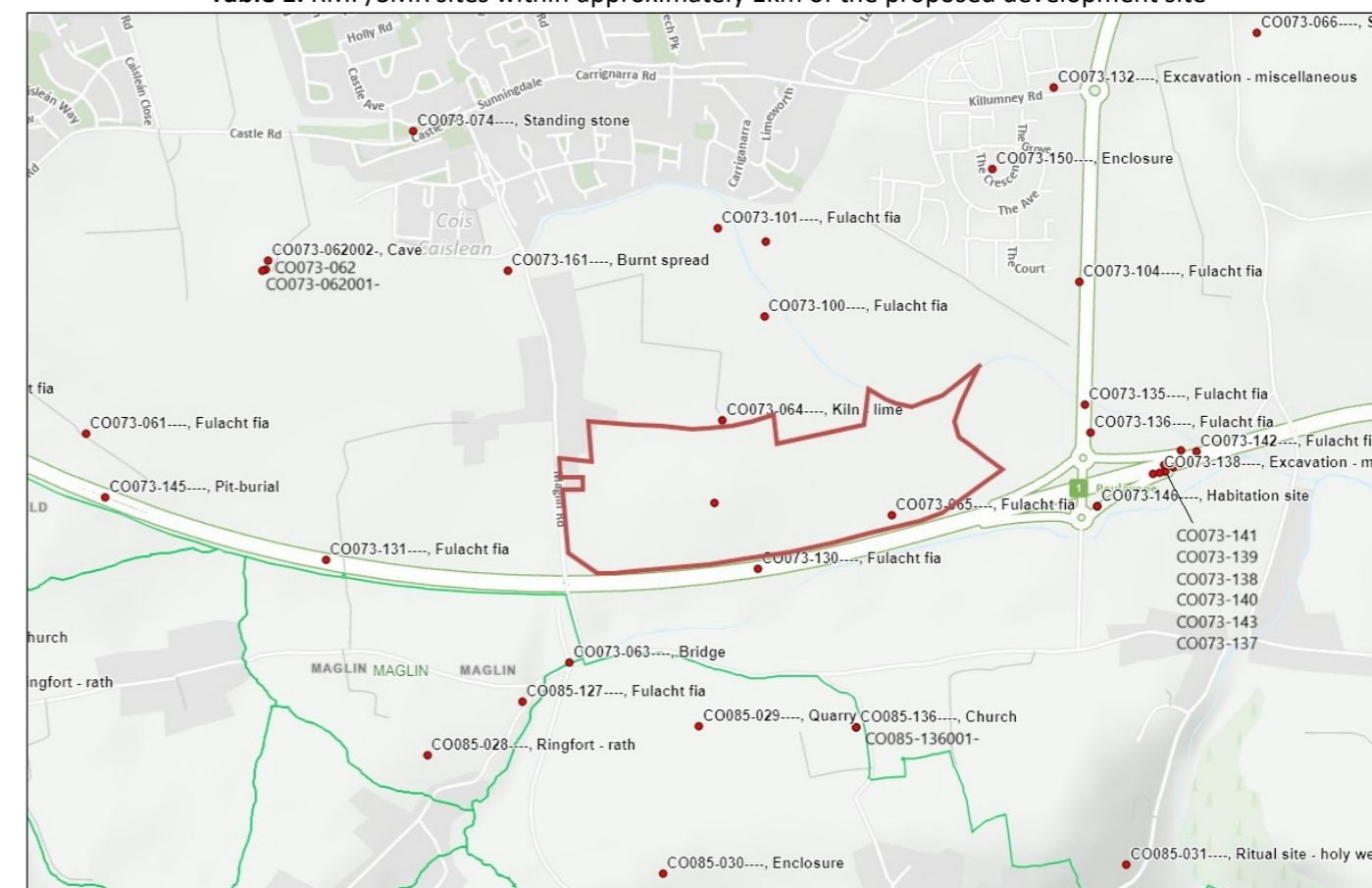
The fulacht fia was investigated during the construction of the N22 (which borders the south side of the proposed development site). It measured 19m E-W by 18m N-S. It remains preserved *in situ* (ASI files).

2.2 There are thirty-nine recorded archaeological sites within an approximate 1km radius of the proposed development site (Table 1 and Fig. 5). These are listed in the Record of Monuments and Places (RMP) for County Cork and the Sites and Monuments Record (SMR) database of the Archaeological Survey of Ireland (ASI). They provide evidence for human settlement and activity in the area dating from as early as the late Neolithic/ Beaker period (*circa* 2500BC) and indicate the archaeological potential of the proposed development site. The RMP lists all archaeological monuments and places known to be of archaeological importance in the county and affords them statutory protection under the National Monuments Act 1930 to 2004 (1994 amendment). The SMR database is a working database of all known archaeological monuments in the state and is continually updated. A large number of these known archaeological sites were identified and excavated during the construction of the Ballincollig bypass (N22) along the southern boundary of the proposed development site in the early 2000s (Hanley and Hurley 2013). Other archaeological sites have been discovered in more recent times with the continuing growth and expansion of the town of Ballincollig.

RMP/SMR	SITE TYPE	TOWNLAND	DISTANCE
CO073-065	Fulacht fia	Maglin	Within site
CO073-097	Country house	Maglin	Within site
CO073-064	Lime kiln	Maglin	20m to N
CO073-100	Fulacht fia	Maglin	230m to N
CO073-101	Fulacht fia	Maglin	465m to N
CO073-103	Standing stone	Carrigrohane	405m to N
CO073-074	Standing stone	Ballincollig	800m to N
CO073-161	Burnt Spread	Ballincollig	400m to N
CO073-082001-	Souterrain	Carrigrohane	1.06km to N
CO073-082	Ringfort	Carrigrohane	1.06km to N
CO073-150	Enclosure	Carrigrohane	485m to N
CO073-132	Miscellaneous excavation	Carrigrohane	711m to N
CO073-066	Standing stone	Carrigrohane	1.06km to NE
CO073-104	Fulacht fia	Carrigrohane	325m to NE
CO073-135	Fulacht fia	Curraheen	255m to E
CO073-136	Fulacht fia	Curraheen	235m to E
CO073-141	Fulacht fia	Curraheen	430m to E
CO073-142	Fulacht fia	Curraheen	465m to E
CO073-137	Burnt mound	Curraheen	360m to E
CO073-138	Miscellaneous excavation	Curraheen	410m to E
CO073-139	Fulacht fia	Curraheen	390m to E

CO073-140	Burnt mound	Curraheen	410m to E
CO073-143	Fulacht fia	Curraheen	390m to E
CO073-146	Habitation site	Curraheen	245m to E
CO073-130	Fulacht fia	Maglin	20m to S
CO085-031	Holy well	Ballynora	940m to S
CO085-136	Church	Ballynora	430m to S
CO085-136001-	Graveyard	Ballynora	430m to S
CO085-029	Quarry	Ballynora	380m to S
CO085-030	Enclosure	Ballynora	725m to S
CO073-063	Bridge	Ballynora Maglin	220m to S
CO085-127	Fulacht fia	Maglin	350m to S
CO085-028	Ringfort	Maglin	585m to SW
CO073-131	Fulacht fia	Maglin	565m to W
CO073-061	Fulacht fia	Greenfield	1.1km to W
CO073-145	Pit burial	Greenfield	1.08km to W
CO073-062001-	Bawn	Ballincollig	845m to NW
CO073-062	Castle	Ballincollig	845m to NW
CO073-062002-	Cave	Ballincollig	845m to NW

**Table 1:** RMP/SMR sites within approximately 1km of the proposed development site



**Figure 5:** Extract from OSI map with SMR details (from [www.archaeology.ie](http://www.archaeology.ie)) showing proposed development site in red and archaeological sites within approximate 1km radius

2.3 The earliest known archaeological site within 1km of the proposed development site is a habitation site (CO073-146) which was excavated on the N22 road corridor in Curraheen to the east. Evidence of a multi-phased settlement was revealed dating to the Late Neolithic/Beaker Period and later activity from the early medieval period. Thirty five sherds of Beaker pottery, flint debitage, charcoal and charred seeds were recovered from a single pit on this site. Charcoal from the pit was dated to the 2580–2200 BC (Danaher 2002b). Two areas enclosed by fosses were also excavated: the larger of the two would appear to have been the settlement area while the smaller may have functioned as an animal compound. Radiocarbon dating of

both fosses gave an early medieval date (AD 400-900). Over 100 features consisting of post-holes, stake-holes and pits were excavated within the larger enclosure and the remains of a post-built oval house (c. 8m E-W; 6m N-S) was identified in the NE quadrant (*ibid.*). In Ballincollig in 2019 an isolated pit was excavated and dated to the Chalcolithic period 2450-2300BC in advance of development (Purcell and O’Leary 2019b). The pit contained eight sherds of prehistoric Beaker type pottery (Helen Roche pers comm.) and charred environmental remains.

- 2.4 The majority of the known sites in the area of the proposed development site are fulachtaí fia (numbering 14) and burnt mounds and spreads (numbering 3), many of which are located close to the banks of the Maglin River and its tributaries. Fulachtaí fia are generally interpreted as ancient cooking sites, but could have been used for any purpose that required large quantities of hot or boiling water. They survive as a spread, or mound, of heat-shattered and burnt stone. The burnt stone generally fills and covers one or more troughs or pits cut into the ground. The trough, which was often lined with timber, wattle or stone, would have been excavated below the water table, near a spring or stream and allowed to fill with water. A fire was set adjacent to the trough, to heat stones, and the water was then heated or boiled by immersing the fire-heated stones in it. Experiments have shown that large quantities of water can be boiled in this way in about twenty minutes and joints of meat wrapped in straw can be cooked over several hours. After each use the burnt and heat-shattered stones would have to be cleaned out of the trough. Over time this material accumulated to form a crescent shaped mound of burnt material around the trough. Fulachtaí fia are usually dated to the Bronze Age (2400-500BC). Although they are generally interpreted as cooking sites they were also used for bathing, processing textiles, tanning, brewing, extraction of fats from meat, and soap making, or even a combination of these functions (Ó Drisceoil, 1988; Monk 2007; Quinn & Moore 2007). Burnt mounds and spreads are usually the levelled remains of ploughed out fulachtaí fia.

There are three recorded standing stones in the area, two of which are no longer extant (CO073-103 and CO073-074). These monuments may also have dated to the Bronze Age, although standing stones were also erected in the Iron Age and some can date to more recent centuries. Those erected in the prehistoric period tend to have a NE-SW orientation and the extant standing stone in Carrigrohane (CO073-066) is aligned as such. Standing stones may have had a number of functions in the prehistoric landscape. They were often erected in prominent locations and may have marked routeways or tribal boundaries, but others may have marked burials or had a ceremonial or ritual purpose. More recent examples may have been erected as scratching posts for animals.

A number of isolated pits identified during the construction of the N22 may also date to the Bronze Age or later prehistoric period. In Carrigrohane to the north of the proposed development site three pits (CO073-132) were excavated, also in advance of road construction. A sherd of possible Bronze Age pottery, flint and chert debitage and a miniature stone (porcellanite) axe were recovered from the pits (Danaher 2002a). An isolated semi-circular pit (CO073-138) was identified in Curraheen which contained heat-shattered stones and charcoal (Russell 2002).

More recently archaeological excavation was carried out in Carrigrohane approximately 620m to the north following the identification of a cluster of pits by geophysical survey (Nicholls 2022a). Excavation confirmed the presence of over twenty large pits of prehistoric date as well as associated stakeholes and postholes (Purcell, in prep.). Archaeological testing approximately 500m to the north, also in Carrigrohane revealed an inhumation of Iron Age or early medieval date probably within the ditch of an earlier enclosure (*ibid.*). This was one of two small circular enclosures identified in a geophysical survey (Nicholls 2022b).

- 2.5 A smaller number of recorded archaeological sites in the vicinity of the proposed development site date to the early medieval period including a ringfort and souterrain in Carrigrohane (CO073-082 and CO073-082001-) and a ringfort in Maglin (CO085-028). These monuments date to the historic, early medieval period, also known as the Early Christian period (5th to the 12th century AD), when Christianity was introduced to the country. Ringforts (also known by the names rath, lios, cathair or caiseal/cashel) are defended farmsteads and are the most characteristic monument of this period. Their main phase of construction and occupation

dates from the beginning of the 7th century AD to the end of the 9th century. They are generally circular or oval in plan, defined by an earthen bank with an external ditch or fosse. Some ringforts have associated souterrains and others have associated corn-drying kilns and sometimes external structures. Generally, it has been speculated that the elite of society occupied ringforts and that the less wealthy lived in undefended settlements scattered across the landscape. In more recent archaeological investigations, particularly on road infrastructure projects in Co. Cork, the number and type of unenclosed medieval settlements identified has been growing, suggesting more diversity in contemporary settlement patterns (Monk 2019) and challenging the perceived importance of ringforts within the early medieval landscape. The ringfort (CO073-082) and souterrain (CO073-082001-) in Carrigrohane to the northeast were investigated in advance of a proposed development. Both the inner and outer ditches of the ringfort were identified as well as internal and external features, and evidence for a possible souterrain was found (Moloney 2003).

While souterrains in many cases are associated with ringforts, they can also be found in isolation. They are underground structures generally earth or rock-cut comprising chamber(s) connected by narrow creepways. The term souterrain derives from the French *sous* meaning under and *terre* meaning earth. When in contemporary use they would have been called *óin* or *uam* (*uaimh* in modern Irish) and on cartographic sources are usually noted as caves (Clinton 2001, and Power *et al.* 1992). It is thought that they were probably used as hideaways or defensive features but they may have also been used for storage (*ibid.*).

The term enclosure is frequently applied to ringforts which have been levelled and no visible surface trace remains. The enclosure in Carrigrohane (CO073-150) to the north was identified as a 40m diameter circular enclosure by geophysical survey in 2008 (Nicholls 2008) and the surrounding area was subsequently archaeologically tested (Cummins 2008). The enclosure was preserved *in situ* within the Heathfield development and subsequent archaeological monitoring of the surrounding area during development revealed no associated features or finds of archaeological significance (Purcell and O’Leary, 2019a and Purcell and O’Leary, 2021). Two shallow pits were identified and excavated during monitoring at the eastern edge of the Heathfield development, however no finds were recovered leaving their date uncertain (Purcell and O’Leary 2024). Approximately 700m to the northwest of the proposed development site in Ballincollig a circular enclosure (defined by a double ditch *circa* 50m in diameter), a semi-circular enclosure (*circa* 32m in diameter) and ancillary features were identified by geophysical survey (Hogan, Davis, and Gimson 2017). Subsequent archaeological testing confirmed the presence of a circular enclosure and additional features. As there were no finds the date of the deposits remains unclear (Purcell 2022). Further archaeological work will be undertaken here in advance of construction.

- 2.6 Ballincollig Castle (CO073-062), bawn (CO073-062001) and cave (CO073-062002) are located to the northwest of the proposed development site on a prominent limestone outcrop. The castle is a tower house which was the principal stronghold of the Barrett clan who purchased the site in 1468 and probably built most of the present structure shortly afterwards (Power, *et al* 1997). Tower houses generally date to the 15<sup>th</sup>/16<sup>th</sup> century and were built as residences by both Gaelic and Old English families. Although not castles in the military sense, they maintain many of the defensive features like battlements and narrow slit windows. Ballincollig tower house occupies a steep-sided limestone outcrop (c. 40m E-W; c. 55m N-S) in the Maglin Valley. It consists of a tall rectangular 4-storey tower (4.5m N-S; 5.3m E-W) that stands on the eastern side of an area enclosed by a high bawn wall that is intact except for a 20m gap mid-way along the eastern side (*ibid.*). There is a 3-storey rectangular tower in the southeast corner of the wall. A mural tower stood inside the northeast corner of the bawn and another stood along the south, both of which are missing inside walls. The tower was repaired by the Wyse family in the 19<sup>th</sup> century and there is a stone plaque on the east wall inscribed ‘W 1857’ (*ibid.*).
- 2.7 There are a small number of recorded sites dating to the modern period within the vicinity of the proposed development site including the lime kiln (CO073-064) a short distance to the north and the quarry to the south in Ballynora (CO085-029). Both are shown on the 1842 Ordnance Survey (OS) 6-inch map. The lime kiln is depicted in a quarry, the larger part of which extended to the south of the kiln into the proposed development site (Fig. 6). Limekilns, which were very common in the Irish rural landscape from the 18th to

20th centuries, were used to produce lime by burning limestone at very high temperatures (900° C to 1000° C). The use of lime in farming was widespread; as a fertilizer, an improver of soil and general farming conditions, as a clean-all disinfectant wash in farmyards, in making mortar, as a slug, snail and ant repellent and as a frost protection for stored potatoes. Many limekilns have been destroyed or have become overgrown and dilapidated and are now barely recognisable in the landscape.

2.8 The three editions of the Ordnance Survey (OS) maps were examined to assist in understanding the development of the area since the mid-19<sup>th</sup> century. The 1842 OS 6-inch map (Fig. 6) depicts the area of the proposed development site as all or parts of ten large fields surrounding Maglin country house. The house is accessed by a partially tree-lined avenue extending east from a gate lodge on the Maglin Road. The house is surrounded by attendant farm and out buildings with a walled garden to the south and a small lake (Lough Boy) to the southeast. The surrounding fields are roughly rectangular in shape and there is the aforementioned quarry and limekiln (CO073-064) along the northern boundary accessed by a small road/trackway running east from the Maglin Road. The larger part of the quarry lies within the area of the proposed development and the lime kiln lies outside to its north. The Maglin River defines part of the eastern boundary of the proposed development site.

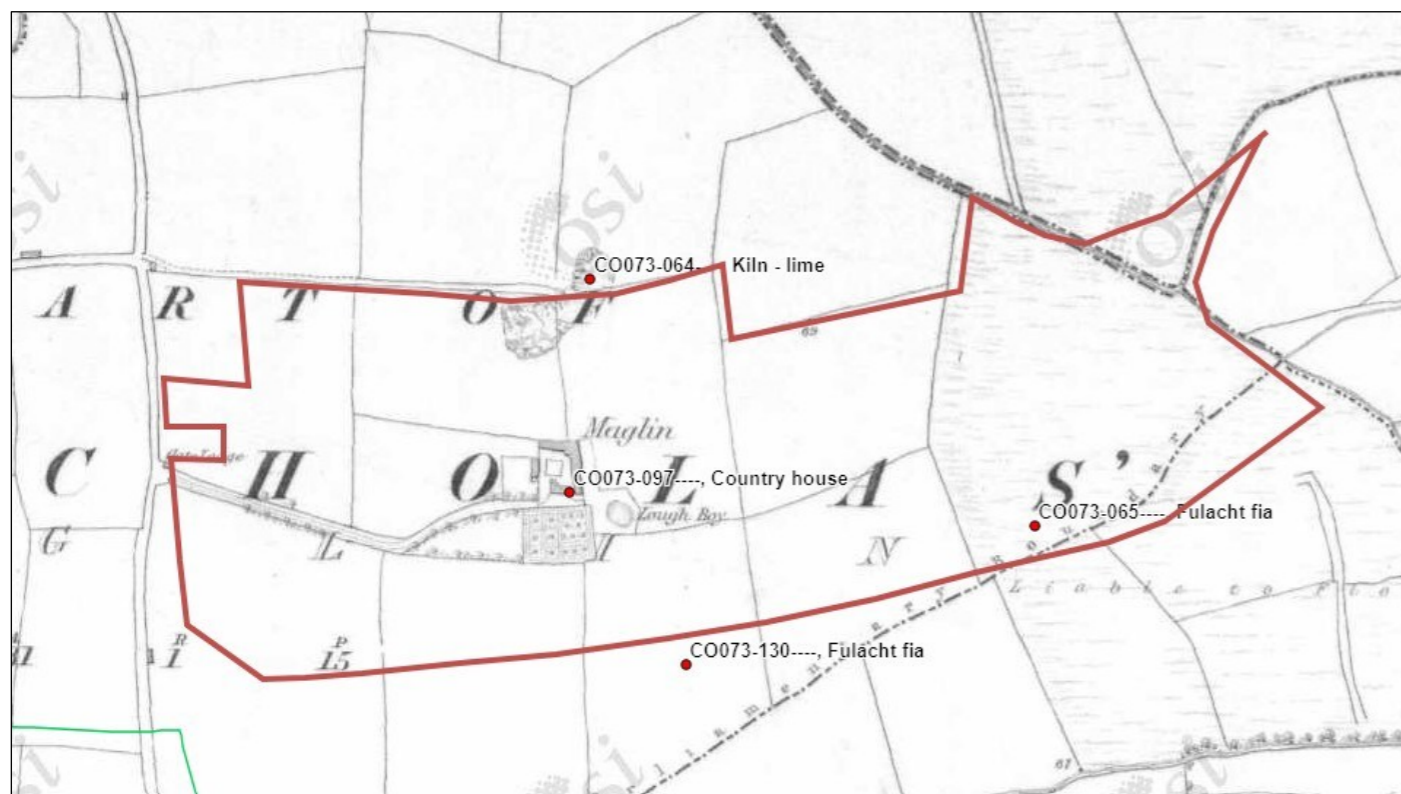


Figure 6: Extract from OS 6-inch map (1842) showing proposed development site ([www.archaeology.ie](http://www.archaeology.ie))

When the 25-inch map (1903) was compiled (Fig. 7) some small amendments to field boundaries had been undertaken within the area of the proposed development site, but little else had changed. To the north the quarry is shown as much smaller and appears to be largely backfilled and is described as disused. The OS 6-inch map of 1939 (Fig. 8) shows the area of the proposed development site virtually unchanged, except for new drainage channels between fields, discharging into the Maglin river to the east.

2.9 An OSI aerial image shows the area of the proposed development site in the late 1990s prior to the construction of the N22 (Fig. 9). The land was mostly under pasture and occasionally subdivided into smaller paddocks. After the construction of the N22 significant changes to field boundary alignments took place as the southern fields were severed by the road corridor (Fig. 3). No features or anomalies are visible on available aerial images.

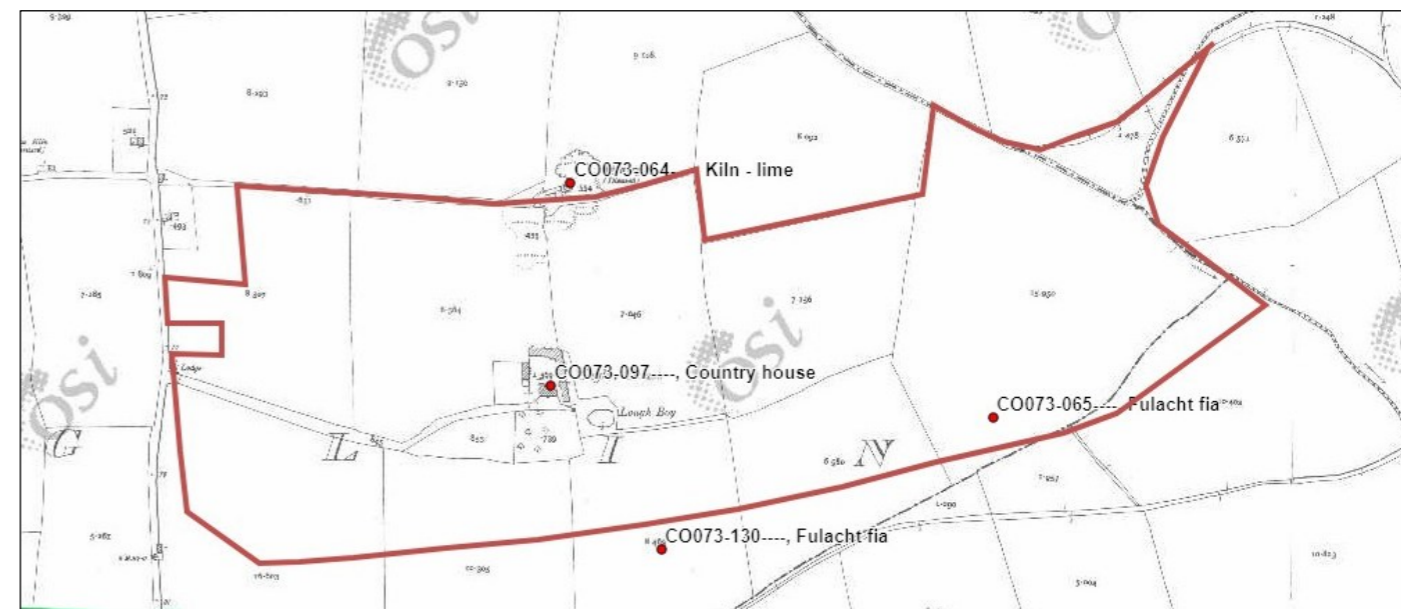


Figure 7: Extract from OS 25-inch map (1903) showing proposed development site ([www.archaeology.ie](http://www.archaeology.ie))

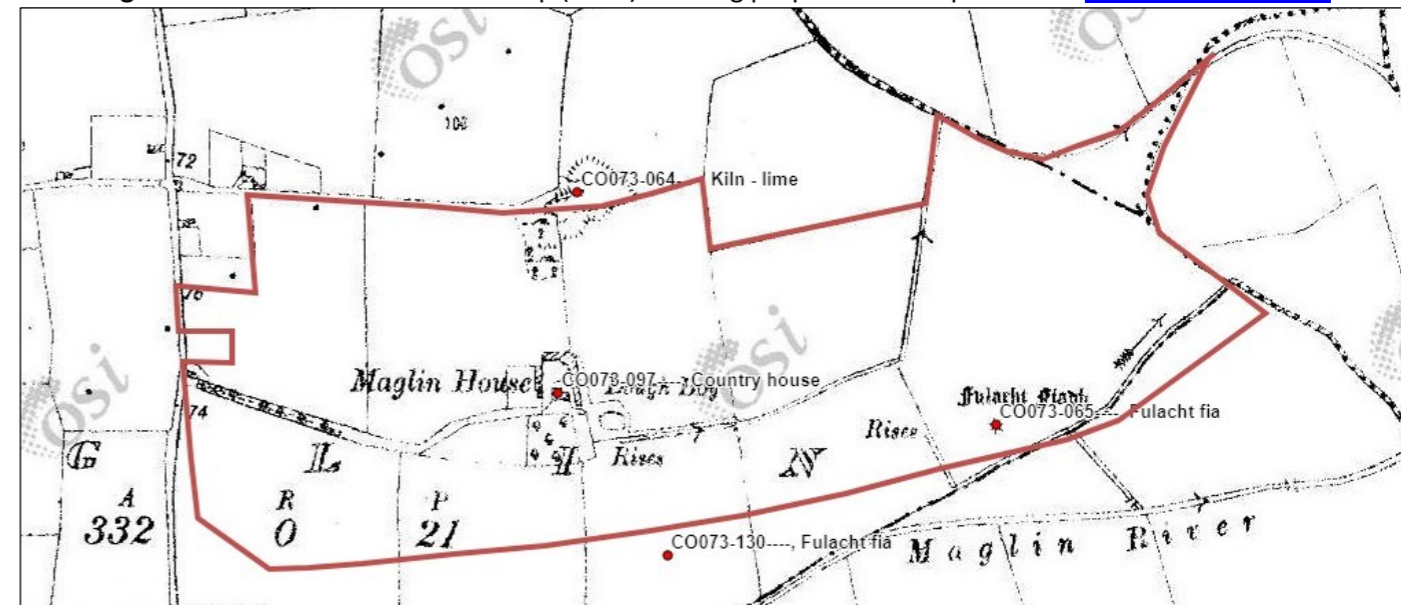


Figure 8: Extract from OS 6-inch map (1939) showing proposed development site ([www.archaeology.ie](http://www.archaeology.ie))



Figure 9: Extract from OSI aerial image 1996 to 2000 MapGenie ([www.archaeology.ie](http://www.archaeology.ie))

### 3 Geophysical Survey

- 3.1 A pre-planning geophysical survey was carried out on the proposed development site in February 2024 under licence 24E0002 (Nicholls 2024) (Fig. 10 and 10a). The survey comprised a high resolution recorded magnetometry survey with the aim of identifying, mapping and describing any geophysical anomalies of possible archaeological origin (*ibid.*).
- 3.2 No responses of definite archaeological character were recorded in the survey, however, responses of potential archaeological significance were identified in the data ...“the most notable of these visible as curvilinear positives suggesting potential enclosure remains to the S and SE in M3 and M5.” Numerous small scale positives, poorly defined linear anomalies and trends of questionable significance were also detected but these anomalies were considered to be of limited interest, expected to derive from either recent landuse, natural soil or geology and modern ferrous (*ibid.*) The results are outlined in Table 2 below

Discussion of survey results from M1-M8			
Area	Anomaly(s)	Location	Description & likely provenance
M1	1	S	Linear/curvilinear trends of uncertain origin. The possibility that 1 represent weakly magnetic buried features of significance should not be dismissed. A recent landuse and/or natural soil/geological origin should also be considered.
M2	2-4	NW, SW, N of centre	Connecting trends and discrete positives of uncertain origin. Responses 3-4 occur within an increase in the magnetic background deriving from former cultivation and natural soil/geological variation. An archaeological origin for 2-4 is deemed unlikely.
M3	5	S	Weakly positive curvilinear ditch type response c.30m in diameter potentially highlighting remnants of a levelled enclosure, with traces of faint linear anomalies at the interior. An archaeological interpretation for 5 remains tentative given this anomaly's limited magnetic signature and its location at the limits of survey.
M3	6-7	SW	Discrete small-scale positives and trends of uncertain origin recorded at western perimeter of response 5. The significance of 6-7 remains uncertain given their weak magnetic signature. A recent landuse, natural soil/geological explanation and/or modern ferrous origin should also be considered.
M3	8	NW of centre	Cluster of small-scale positives of uncertain origin. A natural soil/geological and/or modern ferrous origin is deemed most likely.
M4	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M4. The results from this investigation area highlight broad modern ferrous N-NE, with weak trends of limited potential and natural/soil geological variation also evident.
M5	9	SE	Weakly positive curvilinear ditch type response potentially highlighting remnants of a levelled enclosure. An archaeological interpretation remains tentative given this anomaly's limited magnetic signature and its location at the limits of survey.

M5	10-11	SE	Pattern of weakly positive linear responses indicating remnants of a possible early field system. Interpretation remains tentative and a recent landuse and/or natural soil/geological origin should also be considered.
M5	12	SW	Rectilinear trend and positive response uncertain in origin recorded at perimeter of large-scale modern ferrous corresponding to location of infilled pond referred to on historic mapping as Lough Boy.
M6	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M6. The results from this investigation area highlight small-scale positives of limited significance to the N-NW and SW, and weak linear/curvilinear trends indicative of natural/soil geological variation.
M7	13	N	Curving linear trends potentially forming the southern perimeter of a possible levelled enclosure recorded to the SE in M5. Interpretation remains highly tentative: these anomalies are at the limits of detection, barely visible above background variation, and a recent landuse and/or natural soil/geological explanation should also be considered.
M7	14-17	Centre, S, SW, NE	Poorly defined positives and weak trends of uncertain origin. The significance of 14-17 remains highly tentative and a recent landuse, natural/soil and/or modern ferrous origin is expected.
M8	NA	NA	No responses indicative of archaeological settlement/activity or significant potential are evident in the results from M8. Widespread strong magnetic disturbance occurs throughout, this likely resulting from ground works connected with construction of the Southern Ring. Where features of archaeological significance may be present in M8 they will remain undetected due to the range of modern interference encountered.

Table 2: Results and interpretation of geophysics (Nicholls 2024)



Figure 10: Geophysical survey interpretation (Nicholls 2024)

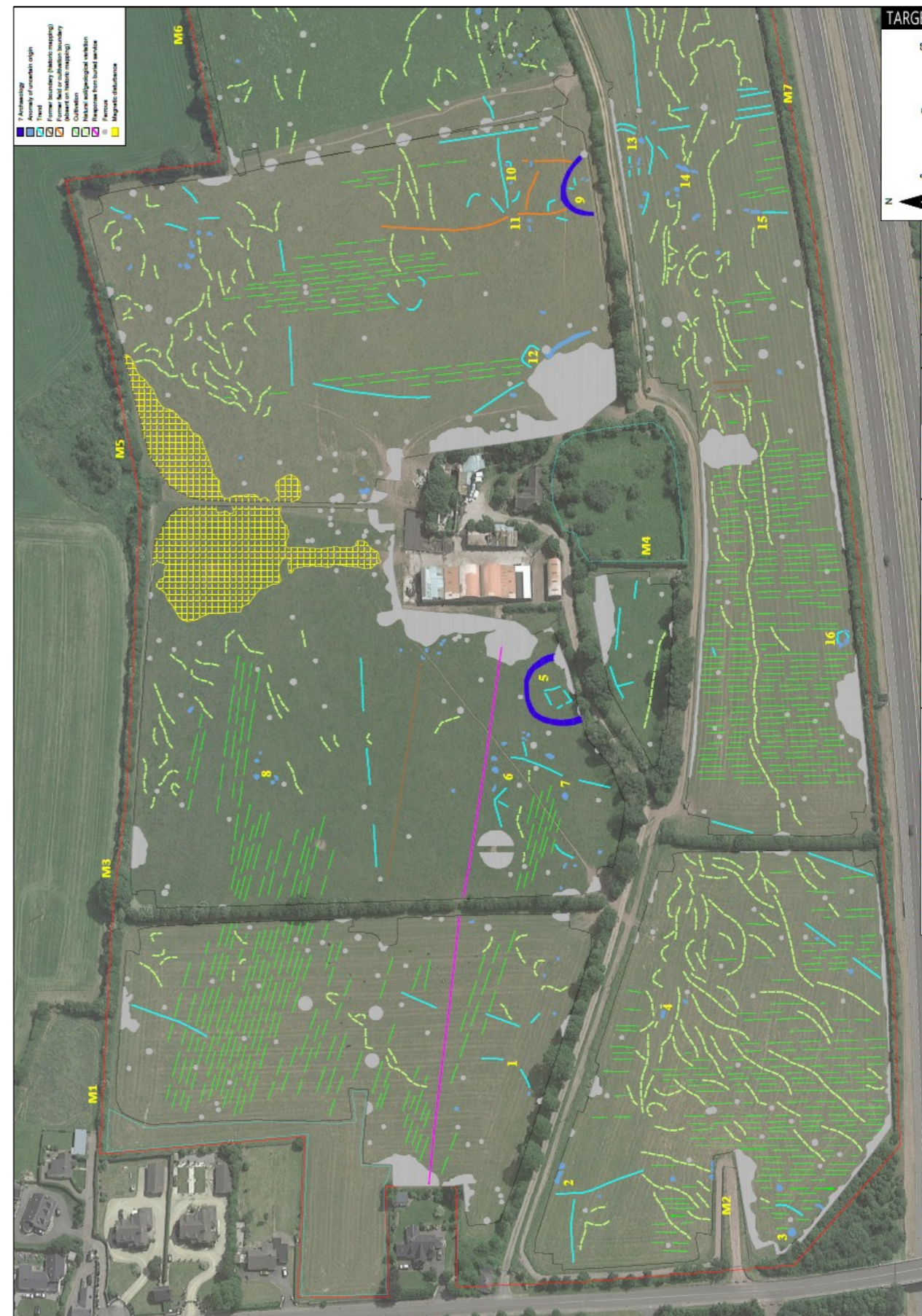


Figure 10a: Close up of geophysical survey interpretation (Nicholls 2024)

#### 4 Test Trenches

4.1 Archaeological testing was carried out on the 20<sup>th</sup> August 2024 in dry, sunny weather conditions under licence 24E0723. Following consultation with the Cork City Archaeologist it was agreed the three geophysical anomalies (5, 9 and 13) considered to be of archaeological potential would be investigated (Figs. 11, 11a & 11b). Three trenches were opened across each of the anomalies – nine trenches in total. All trenches were mechanically excavated using a grading bucket and were 2.2m wide. Trenches 1-3 were excavated across Anomaly 13 in Field M7, Trenches 4-6 were excavated across Anomaly 5 in Field M3 (Fig. 11a) and Trenches 7-9 were excavated across Anomaly 9 in Field M5 (Fig. 11b). The trenching was undertaken after a period of dry weather and soil conditions were very dry with colour changes somewhat muted making features more difficult to photographically record.



Figure 11: Trenches 1-9 excavated across Anomalies 5, 9 and 13

##### 4.2 Trench 1

Trench 1 was 15.7m long and oriented NE SW

Section

0 – 0.25m	Topsoil
0.25 – 0.6m	Light grey brown fine loamy clay, almost stone-free with a band of stoney orange loamy clay subsoil towards the centre, broadly corresponding with the geophysical trend. No archaeological features were identified in the trench.

##### 4.3 Trench 2

Trench 2 was 19m long and oriented NS

Section

0 – 0.22m	Topsoil
0.22 – 0.46m	Light grey brown pink loamy clay, almost stone free. There was a band of orange brown-stone flecked clay with manganese at the northern end of the trench. A modern stone-filled NW-SE drain cut across the trench slightly south of centre. No archaeological features were identified in the trench.

##### 4.4 Trench 3

Trench 3 was 19m long and was oriented EW

Section

0 – 0.25m	Topsoil
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0.25 – 0.55m	Light orange-brown pink firm loamy clay with some large irregular pieces of angular limestone through the subsoil. At the western end the subsoil was more pebble-flecked and also flecked with manganese. No archaeological features were identified in the trench.
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Plate 1: Trench 1, looking NE

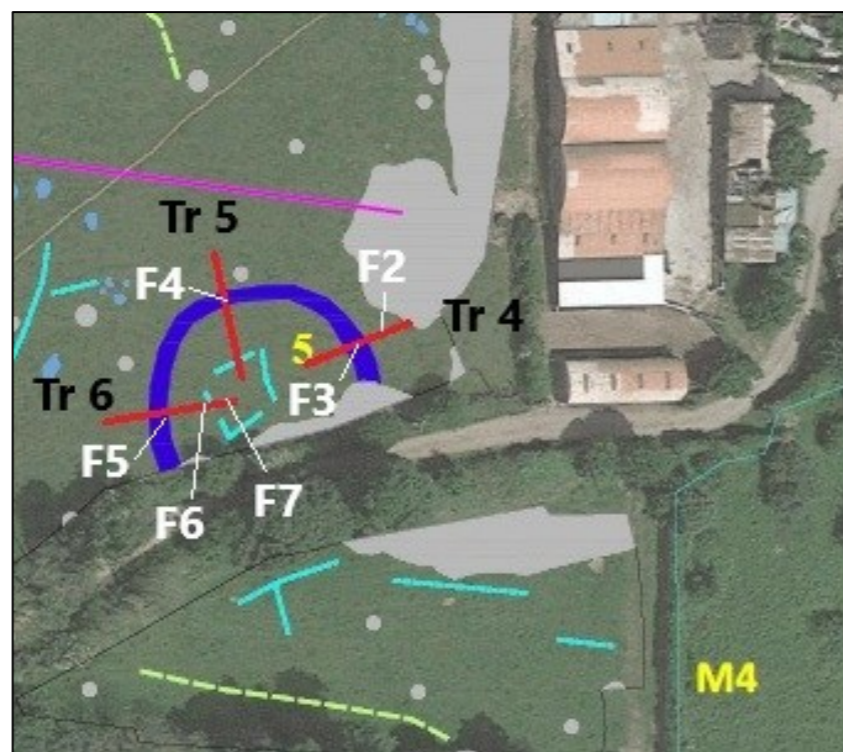


Plate 2: Trench 2, looking N



Plate 3: Trench 3, looking west

Figure 11a: Trenches 4, 5 & 6 across Anomaly 5



4.5 Trench 4  
Trench 4 was 18.5m long and was oriented WNW ESE  
Section

0 – 0.26m	Topsoil
0.26 – 0.45m	Light orange brown pebble-flecked firm loamy clay. Two features of archaeological potential were identified in the trench (Features 2 and 3). Feature 3 was a band of mid-brown earthy loamy clay, 3-3.5m wide, with very occasional charcoal which was slightly softer than surrounding ground. This was investigated to a depth of 0.15m, at which point the hand investigation stopped but the deposit continued. It corresponded with Anomaly 5 and appeared to represent a probable ditch extending across the trench. Feature 2 was up to 2.3m east of F3 and was a band of scorched clay and charcoal extending NW-SE across the trench and up to 0.43m wide, suggesting the remains of a burnt timber in a slot trench. This feature was not further investigated but is considered to be of archaeological potential.



Plate 4: Trench 4 showing F3 extending across the trench



Plate 5: Trench 4 with arrows showing F2

4.6 Trench 5  
Trench 5 was 21m long and was oriented NS.  
Section

0 – 0.27m	Topsoil
0.27 – 0.6m	Light brown pebble-flecked loamy clay becoming harder and firmer as the trench deepened. One feature of archaeological potential was identified in the trench (Feature 4) which

broadly corresponded with the location of Anomaly 5. This was a 2.3m wide band of softer mid-brown, charcoal-flecked loamy clay. The fill was noticeably softer than the surrounding ground and was investigated to a depth of 0.35m, below which the deposit continued. The fill became darker and slightly richer in charcoal as it deepened.



Plate 6: Trench 5, looking south



Plate 7: Trench 5 showing F4, looking east

4.7 Trench 6

Trench 6 was 22.6m long and was oriented EW.

Section

0 – 0.25m Topsoil

0.25 – 0.47m Light orange brown pebble-flecked loamy clay. Three features or archaeological potential were identified in the trench. One feature (F5) corresponded with the location of Anomaly 5 and appeared to be a ditch. This was 2.4m wide and filled with mid-brown loamy clay becoming richer in charcoal as the deposit deepened. It was investigated to a depth of 0.2m below which the deposit continued. Two features (F6 and F7) were identified to the east of F5, i.e. inside the ditch. Feature 6 was a 0.3m wide band of mid-dark-orange-brown loamy



clay with moderate charcoal extending across the trench, possibly representing a slot trench. Feature 7 was a circular spread of charcoal flecked soil approximately 0.35m diameter which was interpreted as a possible posthole.

Plate 8: Trench 6, looking west



Plate 9: Trench 6, F5 in section, looking south



Plate 10: Trench 6, F6 in section, looking north



Plate 11: Trench 6, F7 looking west

4.8 Trench 7  
Trench 7 was 15m long and was oriented NE SW.  
Section  
0–0.24m Topsoil

0.24–0.42m Light orange-brown pebble-flecked firm loamy clay. One feature of archaeological potential (F8) was identified in the trench the location of which corresponded with Anomaly 9. F8 was 1.7m wide and filled with mid-brown loamy clay with occasional charcoal. It was slightly softer than surrounding ground and was investigated to a depth of 0.2m, below which the deposit continued.

Figure 11b: Trenches 7, 8 & 9 across Anomaly 9

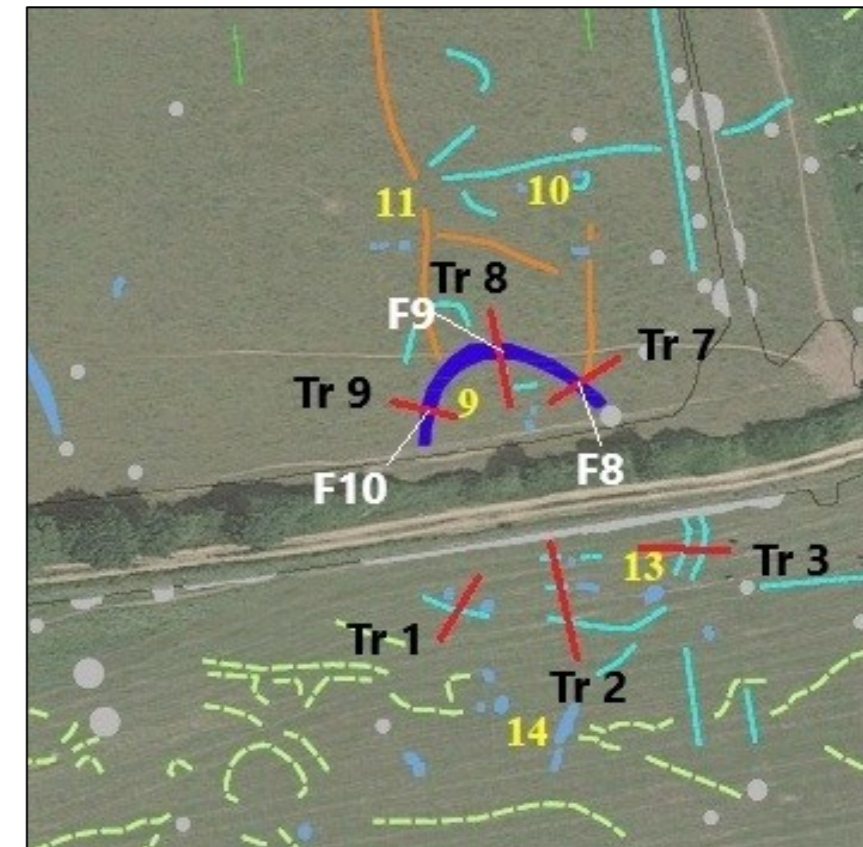


Plate 12: Trench 7, looking NE



Plate 13: Trench 7, F8, looking SE

4.9 Trench 8

Trench 8 was 17.4m long and was oriented NS.

Section

0 – 0.25m	Topsoil
0.25 – 0.46m	Light grey-brown firm, pebble-flecked loamy clay. One feature of archaeological potential (F9) was identified in the trench which corresponded in location with Anomaly 9. F9 was 2.25m wide and comprised a band of mid-orange-brown loamy clay with occasional charcoal. It was slightly softer than the surrounding ground. It was investigated to a depth of 0.2m below which the deposit continued.



Plate 14: Trench 8, looking south



Plate 15: Trench 8, F9, looking east

4.10 Trench 9

Trench 9 was 13.5m long and was oriented WNW ESE.

Section

0 – 0.25m	Topsoil
0.25 – 0.45m	Light orange-brown firm pebble-flecked loamy clay. One feature of archaeological potential (F10) was identified in the trench, the location of which corresponded with Anomaly 9. Feature 10 was a band of mid-orange-brown loamy clay with occasional charcoal. It was 2.5m wide, extended across the trench and was softer than the surrounding subsoil. It was excavated to a depth of 1.05m, with the fill getting slightly darker as it deepened. The sides sloped relatively steeply to a fairly flat deposit of light brown loamy clay which appeared to be subsoil, it was not further investigated.

4.11 The test trenching verified the presence of archaeological features corresponding with two of the anomalies (5 and 9) identified in the geophysical survey. Both anomalies suggest the presence of a semicircular ditch, the southern portion of which is cut by a field boundary and farm trackway.

Anomaly 5 was identified in Trenches 4, 5 and 6 as a probable ditch (F3, F4 and F5) of a semi-circular enclosure. It was apparent as a band (2.3m and 3.5m wide) of mid-brown, charcoal-flecked loamy clay, softer than the surrounding subsoil which was quite firm and dry. The ditch deposit was partially investigated and was found to be slightly richer in charcoal as it deepened. Its full depth was not ascertained but the deposit was consistent across the three trenches. No finds were identified in the deposit. Two other features (F6 and F7) were identified in Trench 6 both of which appeared to lie inside the enclosure (F5/Anomaly 5). F7 appeared to be a posthole and F6 suggested the presence of a narrow slot trench. One feature (F2) was identified in Trench 4 located to the east of the ditch (F3/Anomaly 5) and therefore outside the enclosure. F2 also appeared to represent a burnt linear feature, possibly a slot trench.



Plate 16: Trench 9 F10, looking north

Anomaly 9 was identified as a probable ditch (F8, F9 and F10) in Trenches 7, 8 and 9. The ditch ranged in width from 1.7m in Trench 7 to 2.5m in Trench 9 and contained a fill of mid-brown loamy clay with occasional charcoal flecking which was slightly softer than the surrounding firm, dry subsoil. It was investigated in Trench 9 and was excavated to a depth of 1.05m which appeared to be its base, however, the very dry ground conditions made this difficult to confirm. No associated features were identified in the trenches and no finds were noted.

No archaeological features were identified in Trenches 1-3. The trends identified in the geophysical survey appear to relate to soil variations and geology.

## 5 Conclusions

- 5.1 Archaeological testing was undertaken on agricultural land in Maglin townland, Ballincollig, County Cork where it is proposed to construct an LRD. The proposed development will extend into the adjoining townland of Ballynora at its southeastern corner but testing did not extend into that area. The proposed development lies to the immediate north of the N22 road and south of Ballincollig town.
- 5.2 There are two recorded archaeological sites within the proposed development site, a fulacht fia (CO073-065) and a country house (CO073-097).
- 5.3 A pre-planning geophysical survey of the proposed development site was undertaken to ascertain if any subsurface archaeological features existed on the site. No responses of definite archaeological character were identified, but two curving ditch type responses of potential archaeological significance (Anomalies 5 and 9) were identified possibly representing the remains of levelled enclosures. A third anomaly (13) was considered to be of no archaeological potential.
- 5.4 Following consultation with Ciara Brett, Cork City Archaeologist, archaeological testing of Anomalies 5 and 9 and the nearby anomaly 13 was carried out to calibrate the results of the survey and inform the development layout. The testing was carried out in August 2024 under licence 24E0723.
- 5.5 Three trenches were excavated in each of the three anomalies.
- Trenches 1-3 were excavated across Anomaly 13 which proved to be of no archaeological significance and related to variations in soil and geology.
  - Anomaly 5 was identified in Trenches 4, 5 and 6 and verified as a probable ditch of a curving enclosure. It ranged in width from 2.3m to 3.5m and was investigated to a maximum depth of 0.35m. It was filled with mid-brown, charcoal-flecked loamy clay, softer than the surrounding subsoil which was noticeable firm and dry after a long spell of dry weather. Several other probable associated features were identified in the trenches including two narrow linear features, possible slot trenches, and a probable posthole.
  - Anomaly 9 was also verified in Trenches 7, 8 and 9 as a probable ditch of a curving enclosure. It ranged in width from 1.7m to 2.5m and contained mid-brown loamy clay with occasional charcoal flecking also slightly softer than the surrounding subsoil which again was very dry and firm after the period of dry weather. It was investigated to a depth of 1.05m which appeared to be its base, however, the very dry ground conditions made this difficult to confirm. No associated features were identified associated with Anomaly 9.
- No finds were recovered from any of the trenches.
- 5.6 The test trenching verified the presence of archaeological features corresponding with the two anomalies (5 and 9) identified in the geophysical survey. Both appear to be semicircular enclosures defined by a backfilled ditch. The southern portion of both is cut by a farm trackway flanked by a substantial hedgerow. The construction of the farm trackway probably negatively impacted both ditches, if they extended within its footprint. The proposed development layout has been designed to eliminate the enclosures (Anomalies 5 and 9) from the areas of impact. It is proposed to preserve both *in situ* as green spaces within the proposed residential development.
- 5.7 This results of the archaeological testing will form part of the planning application and all recommendations will be subject to approval by the National Monuments Service and Cork City Council.

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**APPENDIX 15-4 Photos**



**Plate 1:** Field M1, looking northwest



**Plate 3:** Field M2, looking southeast



**Plate 2:** Field M1, looking south



**Plate 4:** Field M3 at the location of the levelled enclosure (Anomaly 5), looking south



**Plate 5:** Field M4, looking east



**Plate 7:** Field M6, looking west



**Plate 6:** Field M5, at the location of the levelled enclosure (Anomaly 9), looking south



**Plate 8:** Field M7, looking east



**Plate 9:** Field M8, looking southwest



**Plate 10:** Field M9, looking west



**Plate 10:** Field M9, looking east



**Plate 11:** View looking southeast along the proposed route of the Maglin Sustainable Access Corridor



**Plate 12:** View looking southwest along the proposed route of the Maglin Sustainable Access Corridor



**Plate 14:** View looking southwest towards the area of the proposed Link Road to Maglin Road



**Plate 13:** Area of overgrowth surrounding limekiln (CO073-064), looking southeast



**Plate 15:** View looking south towards the area of the proposed Link Road to Maglin Road



# CHAPTER SIXTEEN

## CULTURAL HERITAGE: BUILT HERITAGE

APPENDIX 16-1 Photographic Record

APPENDIX 16-2 Conservation Method Statement

**APPENDIX 16-1 Photographic Record**

**Appendix 16.1: Photographic record**



**Plate 1: General view to subject site looking east**



**Plate2: General view to subject site looking north**



**Plate 3: General view to location of proposed road to Heathfield**



**Plate 4: General view to location of proposed new link road to Maglin Road**



Plate 5: General view of overgrown lime kiln to north of subject site



Plate 7: View of subject site boundary at junction of Maglin Road and Cois Cáisleán housing estate



Plate 6: General view along western boundary of subject site on Maglin Road looking north



Plate 8: Stone-built bridge to northwestern within boundary of subject site



Plate 9: General view east to house from driveway



Plate 11: General view to east



Plate 10: General view to west from driveway



Plate 12: General view to north



Plate 13: View to west on trackway to south of walled orchard

### Building A – Gate Lodge



Plate 14: Western elevation to roadside



Plate 15: Southern elevation and porch



Plate 16: Modern flat-roofed extension to eastern wall



Plate 18: Interior of porch



Plate 17: Roof of gate lodge



Plate 19: Main room GF01 looking to rear



Plate 21: Damaged roof in GF01



Plate 20: Modern fireplace in main room GF01



Plate 22: Front bedroom GF02



Plate 23: Rear room GF03



Plate 24: Kitchen and WC in modern extension GF04

**Building B – Maglin House**



**Plate 25: View of Maglin House looking northeast showing front (southern) and western elevations**



**Plate 27: View of roof of Maglin House**



**Plate 26: View of Maglin House looking southwest showing rear (northern) elevation**



**Plate 28: Front (southern) elevation of Maglin House**



Plate 29: Western elevation of Building B-Maglin House



Plate 30: Northern elevation of Building B-Maglin House



Plate 31: Eastern elevation of Building B-Maglin



Plate 32: Roof and eave detail



Plate 33: Deteriorating render on rear elevation



Plate 34: Porch to front elevation



Plate 35: Front elevation with cement render



Plate 37: Ground floor entrance hallway GF01 looking to staircase



Plate 36: Front elevation with altered window cill and uPVC window



Plate 38: Ground floor entrance hallway GF01 looking to porch



Plate 39: Ground floor room GF02 looking towards return with possible blocked up opening



Plate 40: Five-panelled door to GF02



Plate 41: Ground floor hall GF04

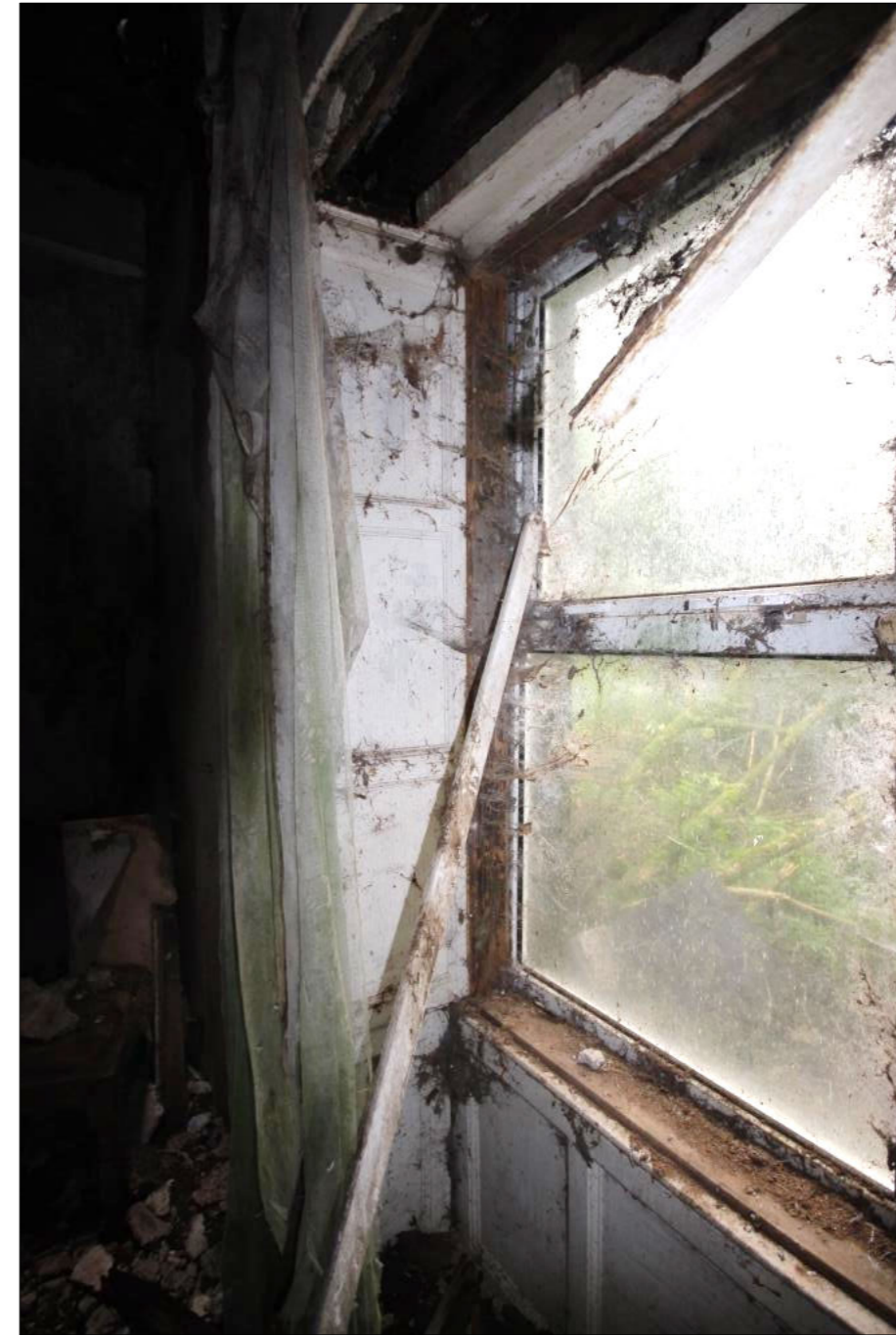


Plate 42: Replacement uPVC window in ground-floor room GF02



Plate 43: Ground floor room GF06



Plate 45: Staircase in hallway



Plate 44: Ground floor room GF05



Plate 46: Decayed floor in hallway under stairs

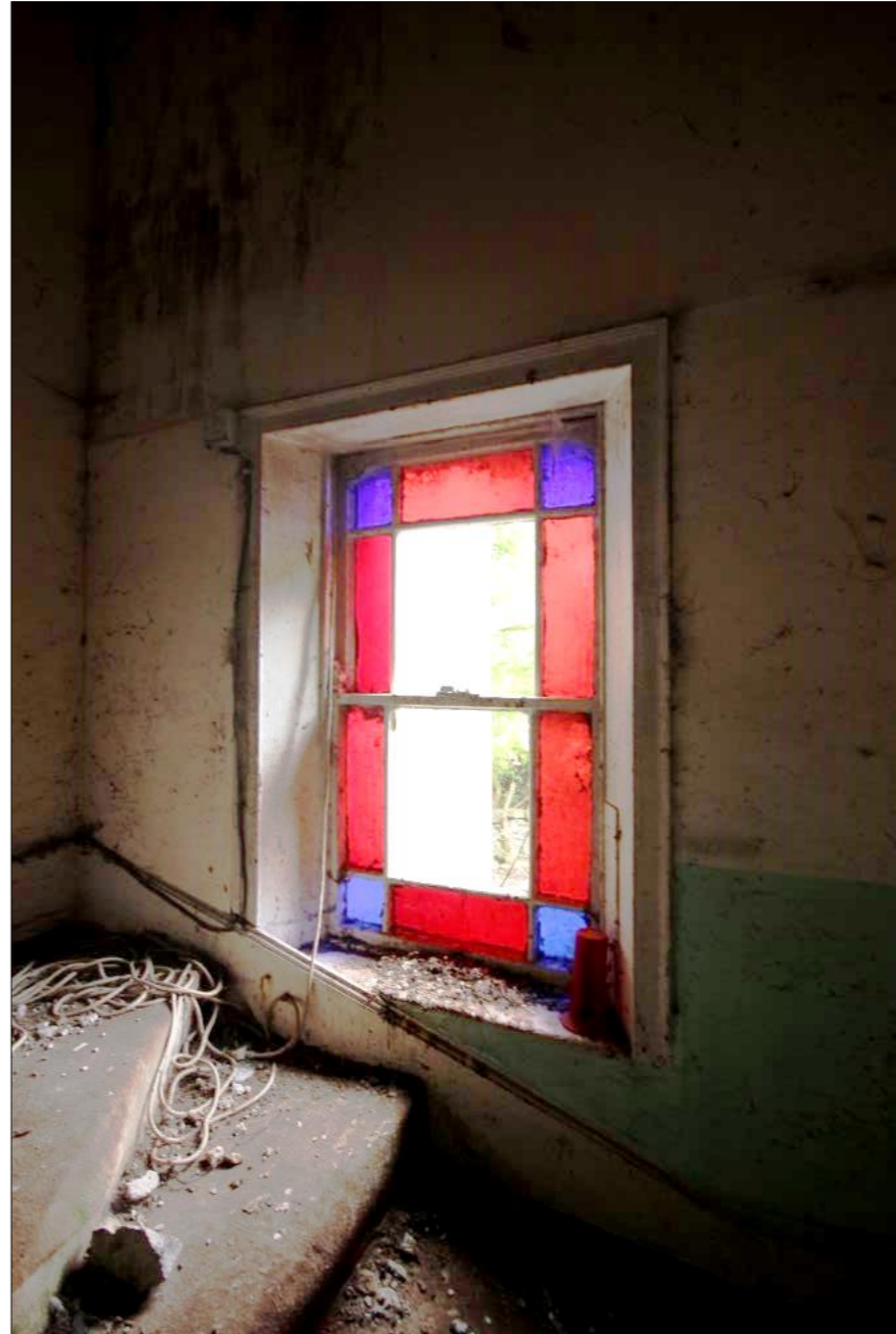


Plate 47: Window to rear in stairwell



Plate 48: Staircase detail

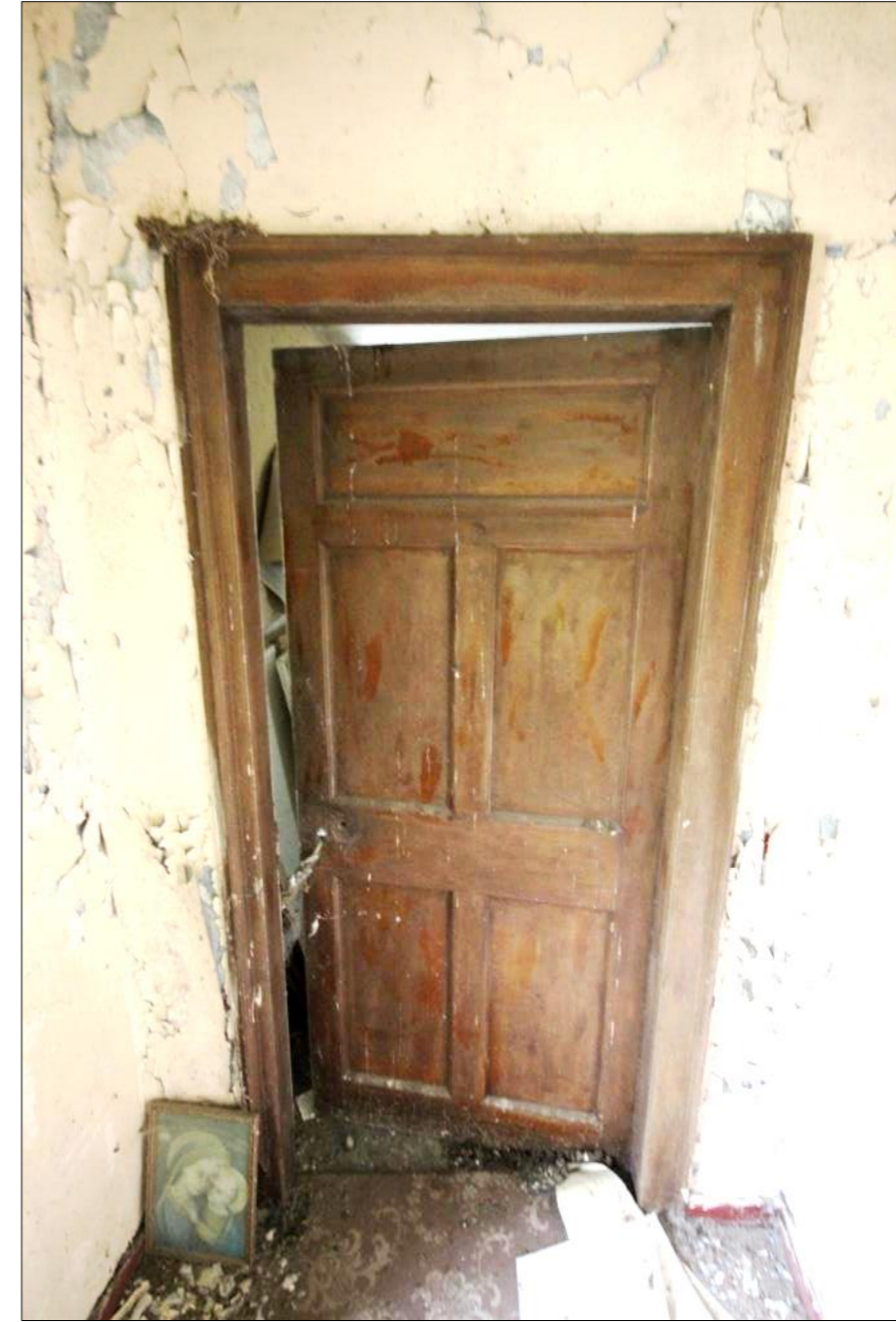


Plate 49: Five-panelled door to first floor room FF02



Plate 50: First-floor landing FF01 looking to FF05 and FF06



Plate 51: First floor room FF02



Plate 52: First-floor bathroom FF04



Plate 53: First-floor bedroom FF05



Plate 55: Roof truss detail



Plate 54: First-floor bedroom in return FF06

**Building C – Western outbuilding**



**Plate 56: General view of farm complex**



**Plate 58: Eastern elevation of Building C-Western outbuilding**



**Plate 57: Northern and western elevation of Building C-Western outbuilding**



**Plate 59: Steps and opening in eastern elevation of Building C- Western outbuilding**



Plate 60: Archway in Building C-Western outbuilding



Plate 61: A-framed truss to Building C-Western outbuilding

## Building D – Northeastern outbuildings



Plate 62: Southern elevation of northern range



Plate 63: Northern elevation of northern range



Plate 64: Eastern elevation of northern range



Plate 66: Interior of northern range looking north

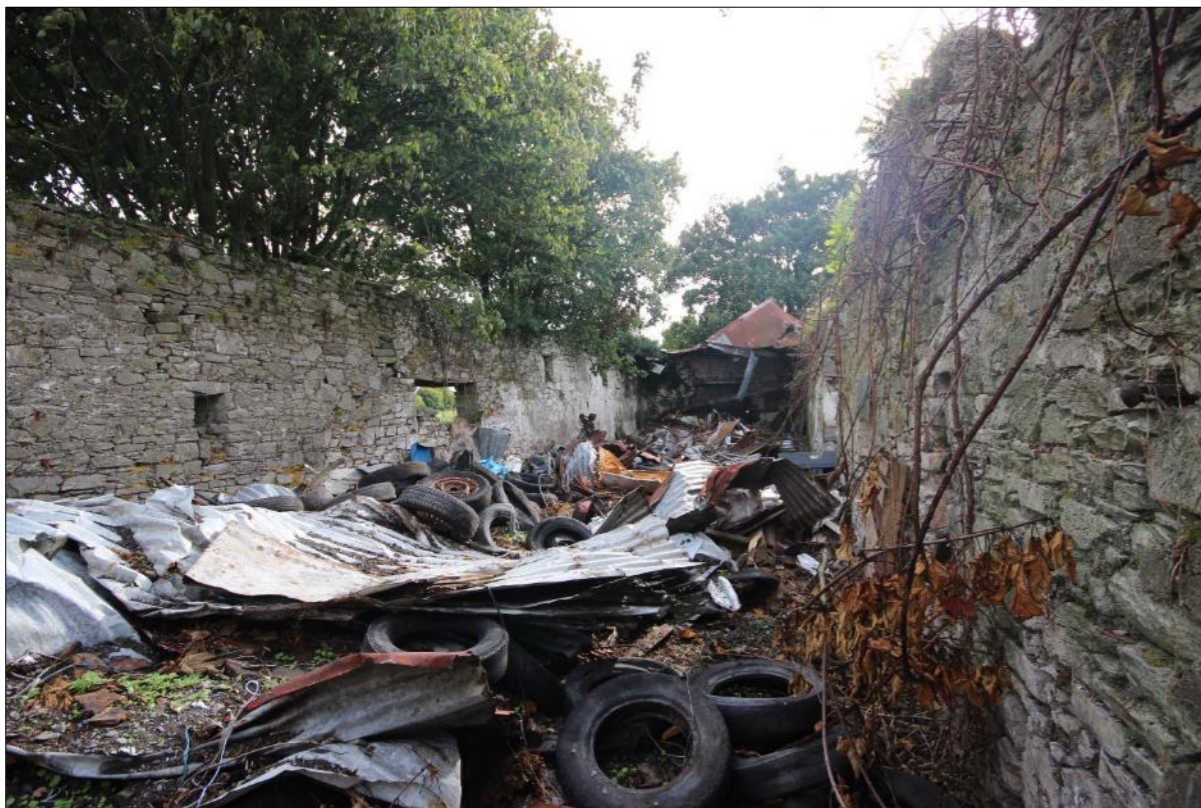


Plate 65: Interior of northern range looking east



Plate 67: Modern blockwork in northeastern corner



Plate 68: Western elevation of eastern range



Plate 70: Western elevation of single-storey workshop to southern end of northeastern range



Plate 69: Eastern elevation of eastern rang



Plate 71: Interior of workshop

**Building E – Walled orchard**



**Plate 72: General view showing Building E-Walled Orchard looking north**



**Plate 74: External western elevation to Building E-Walled orchard**



**Plate 73: Cut-stone pier to entrance to Building E-Walled orchard**



**Plate 75: Eastern elevation of Building B-Maglin House and Building E-Walled orchard**



Plate 76: Overgrown southern wall of Building E-Walled orchard



Plate 78: Interior of southern section of Walled Orchard



Plate 77: Section of collapse in western wall



Plate 79: Brick gate piers between Wadded Orchard and Maglin House



Plate 80: Small garden shed against eastern wall in Walled Orchard



Plate 82: Internal elevation of southern wall of Walled Orchard



Plate 81: Internal elevation of eastern wall of Walled Orchard

**Building F – Modern farm buildings**



**Plate 83: Western elevation**



**Plate 85: Interior**



**Plate 84: Eastern elevation**

**APPENDIX 16-2 Conservation Method Statement**

## Appendix 16.2: Conservation method statement

### Conservation Philosophy

The document published by the Department of Environment, Heritage and Local Government in 2004, namely *Architectural Heritage Protection: Guidelines for Planning Authorities* will, along with the principles embodied in international charters such as the ICOMOS charter on the Built Vernacular Heritage (1999) and the 1964 Venice Charter (on the Conservation and Restoration of Monuments and Sites), form the basis of provided conservation guidance and will inform the supervision of works on this site.

The Charters and the guidelines accurately describe the strategy to be adopted for a project such as the conservation of these buildings, but they cannot dictate every decision, since many of the clauses are open to interpretation.

### General Principles

- Authentic structure and fabric of importance to maintain the structure's special character are to be respected and retained including early alterations of interest.
- All existing sound fabric and features are to be retained and protected.
- It is the objective to carry out works limited to the minimum intervention essential for the survival of the property and its restoration as a residence.
- It is intended in all cases where possible to carry out repairs rather than replacement, which will only be carried out where the fabric has perished.
- It is intended that unsatisfactory alterations which disfigure earlier work of greater merit should be reversed.
- New repairs are to be discernible but sympathetic to the visual integrity of the structure.
- Alterations are to be as far as possible reversible.

The works to the authentic fabric of the building shall be carried out in accordance with this conservation methodology, which shall take precedence over all other documents.

### Supervision and recording during works

All works to the historic fabric of the buildings shall be carried out under the supervision of the consultant historic building consultant and no taking down, opening up nor is any feature or fitting to be removed without his/her approval. The conservation consultant will also be responsible for recording of historic fabric that is to be removed from the building. Where safe and feasible to do so, the consultant will document any significant building phase evident from the fabric exposed/revealed during works. The consultant will prepare a summary document on completion on the refurbishment works.

### Experienced Contractor

Only contractors or sub-contractors with proven experience in the repair of historic buildings shall be engaged on the work. Project architect may request exemplars of works.

### Standard of Finishes

The highest standard of finish is required for the works, and the contractor shall prepare samples for the approval of the conservation consultant before each stage of the work commences.

### Roofs and rainwater goods

The roof to the building needs comprehensive repair given its rapid deterioration over the last two decades through disuse and weathering. Given the dangerous condition of the building, a detailed examination of the roof of Maglin House has not been possible as part of survey for the present document, but it is clear that a significant portion of rafters, timber trusses, purlins and other structural

timbers will require replacement or repair. It may be possible to retain some of the principal trusses. The preferred approach will be to carry out repair works to individual timber elements as far as practicable in order to retain as much functioning original fabric in situ as possible and to prevent loss of the distinctive form of the roof. These details will be easiest to maintain by repairing rather than reconstructing the existing roof. Many of the existing roof slates will be salvageable for reuse on a repaired roof structure with the front and south-east elevations being the most visually prominent. Original slates should be used to clad these elevations when roof structural repairs have been completed with any necessary supplementary natural slate selected to match as closely as possible the size, thickness, colour and grain of the original slates.

Eaves gutters and downpipes should be replaced with appropriately designed cast aluminium held on brackets fixed directly to wall tops. The dimensions of rainwater goods should be sufficient to effectively drain the total plan area of roof they serve, bearing in mind the average expected rainfall for this area. Drainage gullies and subterranean pipework should be confirmed as being in good condition before works are deemed to be completed.

### Chimneys and chimney stacks

Existing chimney stacks will be fully repaired with all chimney flues being retained, capped and ventilated. Any existing chimney pots that have been closed off with cement or a lead capping in the past are likely to contain moisture trapped within the chimney in a stagnant atmosphere where it cannot evaporate. This moisture reacts with soot within the flue and mobilises corrosive compounds that accelerate decay of the chimney breast masonry. After thorough sweeping to remove loose soot deposits within the flue, unventilated caps to chimney pots should be removed and replaced with the correct size of proprietary vented chimney cap, either of plastic, metal or more durable clay. This prevents ingress of rainwater into the flue, prevents debris being dropped into flues by birds and allows air movement within the flue. Blocked fireplaces within the building must incorporate a ventilator at the base of each fireplace to ensure circulation of air throughout the flue that will prevent the concentration of moisture and masonry damage which would result. Flues proposed to be reused should be swept, lined and fully insulated with appropriate material.

The procedure for repairs to the chimney stacks should include the following:

- Carefully remove all existing fixtures and fittings for previous communication aerials.
- Strip all sand-and-cement render from the brick chimney stack taking care to avoid excessive damage to brick.
- Inspect, and if cracked, remove the cast-concrete capping from the chimney stack avoiding further damage to existing clay chimney pots.
- Assess existing pots and replace, if necessary, on a like-for-like basis. This should only take place if the level of damage poses a risk of significant water ingress.
- Any brickwork of the chimneys should be pointed where necessary using an appropriate weak lime mortar (NHL2 or similar hot lime mix) after raking out any loose joint material.
- If necessary to replace the existing concrete chimney capping, a new course of overhanging brick should be bedded on lime to the top of the chimney stack and a dome-topped lime-mortar flaunching should be cast on top of the chimney cap to secure the pots in place and prevent any pooling of water on the structure. Lime mortar on the top surface of the chimney stack (as opposed to the vertical brick-work) can be a stronger, NHL 3.5 or similar. An experienced contractor will have their own preference which can be agreed before works commence.
- A lead cover flashing in code 5 or 6 lead will be installed around the chimney stacks. The cover flashing should be installed into joints at least 100mm above the line of the roof in accordance with details from the Lead Sheet Association – use of mastics, sealants or lead screwed onto the face of brick and plastered over will be unacceptable.
- Any brickwork within the chimney stacks should be rendered with an appropriate lime render with appropriate separation of the corrosive lime from any leadwork. The render contractor must be able to complete this operation without the use of any angle or edge beads.
- Install ventilated caps into the disused pots to enable continued ventilation of the flue but to prevent ingress of water and accumulation of debris dropped into the flue by birds. Each flue needs to be ventilated at the base of internal blocked fireplaces in order to provide sufficient

fresh air circulation within the flue to prevent moisture build-up. Flues should be thoroughly swept and cleared of debris as part of the works.

### External Walls

The external walls of both Maglin House and the former gate lodge have modern sand-and-cement smooth render which has clearly failed and in need of removal and replacement. All existing wall renders should be removed, and the exposed wall surfaces should be brushed down to remove loose or flaking patches of render or substrate.

Hollows and depressions should be dubbed out in as many coats of lime render as necessary with no coat thickness exceeding 10mm. Before any render is applied to a surface, the background must be dampened to reduce and control suction, especially in hot weather. If the substrate is not sufficiently damp, it will soak water from the render as it is applied and reduce the effectiveness of the bond and the strength of the render.

Two-coat work is common, but three-coat work is recommended for all but the smallest render repairs. The first and strongest coats should be 9mm-16mm thick, combed to provide a key for the succeeding coats each of which should be thinner and of the same strength or weaker than the preceding. Finishing coats should be 6mm-10mm thick. Undercoats should be left at least two days in summer and at least seven days in winter protected by ventilated covers to ensure that the initial shrinkage is over before the next coat is applied and the surface lightly sprayed to reduce and control suction immediately before application. The topcoat should be finished with a wood float or similar to ensure an open surface.

Fixing damp hessian or similar over the repaired area and its immediately surrounding surviving render will be necessary to control the drying out and potential shrinkage of repair render. Renders should be given sufficient time to carbonate before painting with any finish that will hinder permeability. Permeable finishes such as limewashes are recommended as they facilitate the natural movement of moisture through the render.

### Internal works

The interior of both Maglin House and the former gate lodge are in an advanced state of disrepair, and all internal fabric will need to be removed. Within the main house, it is envisaged that a new ground-floor slab, staircase and first-floor structure will need to be installed. The existing floors and stairs will be removed and new structures installed incorporating ground-level insulation together with necessary service ducting and maintenance of the existing finished floor height. Note that if preferred, ventilation ducting to chimney flues direct to the building exterior can be installed within the new floor slab to provide the required air-movement within this part of the building (or air supply to a re-used chimney flue) without causing loss of heat from the interior space. New timber stairs will be installed within the main house.

There is no practicably reusable ceiling or wall plaster fabric remaining within Maglin House and the former gate lodge. Furthermore, all internal studwork walls will need to be removed. All new internal walls will be of timber or concrete construction and finished in gypsum plaster. Only on completion of main roof repairs and renewal of chimneys, can work on introducing new partitions within both the main house and the former gate lodge.

### Windows and windowsills

No original or historic windows survive. It is proposed to install new windows throughout (both the main house and the former gate lodge). A conservation joinery works with extensive experience in successful completion of modern replication of historic window frames, often incorporating double-glazing without compromising the proportions and historic character of the original windows will be commissioned to manufacture any new windows for Maglin House and the former gate lodge. The final design of windows will be approved by the supervising conservation consultant prior to their manufacture, and the fitting process will be overseen by the same consultant.

It is important to examine and ensure the integrity of all stone windowsills on the site. These should be free of vertical cracks which could result in moisture ingress into the masonry wall fabric beneath. Cracked windowsills should be replaced with new stone sills to match if they cannot be effectively repaired using resin-bedded stainless-steel dowels and crack sealant or weathered beneath with a suitable lead damp-proof course. It is important that where it forms part of the sill design, there is an effective upstand on sills which prevents water being blown under window frames and into the masonry structure. If necessary, an upstand can be installed on a retained stone sill or damage to existing upstands can be repaired using an appropriate epoxy resin-based filler. A gap should be left beneath timber window frames to enable sufficient ventilation around the window that restricts moisture damage. The gap beneath the sides of any windows should be pointed with a lime mortar which will physically restrict water ingress to this vulnerable part of the opening by soaking up any water in this area from the sill and allowing it to dry out again, preventing it being trapped within the masonry or held for an extended time against the base of the window frame.

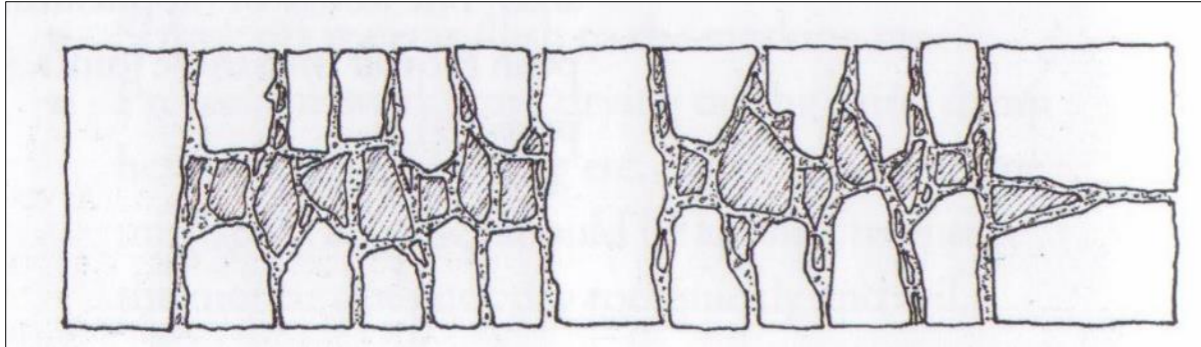
Cleaning of stone windowsills or other external masonry should generally be avoided unless there are excessive damaging chemical deposits on the surface as a result of air pollution. In this case, such cleaning should only be undertaken by a specialist contractor experienced with the need to remove damaging material but causing the minimum possible damage to the stone.

The use of silicone or other sealing mastics around the exterior of timber window frames is not recommended. The outer lining of window frames should have a routed channel in the appropriate location so that the lime reveal plasterwork can be pressed in, creating a nib of plaster which reduces drafts around the box to a minimum and kills any limited expansion and contraction of the timber window frame which should prevent the minor cracking of reveal plaster at its junction with the window outer lining board.

### Treatment of existing boundary walls proposed for retention (i.e. at the walled orchard)

Any localised areas of masonry to be retained or reinstated as part of boundary walls of the former walled orchard, or where rebuilding is necessary following taking down to remove damaging vegetation roots, should be rebuilt in lime-mortared (no use of cement), solid stone masonry to match the style, appearance and structural performance of surviving historic stonework which it adjoins. Engagement of a contractor with proven experience at successfully replicating the features of historic stone walling will be the most effective means of ensuring a successful outcome. Such a contractor will be familiar with the following key points of appropriate workmanship which should form part of a more detailed method statement to be agreed before works take place:

- **break all vertical joints** with none more than two stones high;
- try to maintain an **even vertical surface** with the use of two string lines fitted to a suitable timber profile if required, to reduce projecting or indented stones;
- keep **mortar joints** as tight as those on the historic masonry with use of good-sized **pinning stones** in wider joints to reduce the surface area of pointing mortar;
- keep top and bottom beds of stones **generally level** – larger stones with flat bottom beds and irregular top edges are unsightly and are more often seen on poor-quality modern stonework. Stones which are longer vertically than horizontally are also to be generally avoided;
- **good tying** of face stones with the length of stones extending into the wall core rather than along the face of the wall;
- a **well-built wall core** using stones bedded horizontally, fully covered in mortar and interlocking into gaps between the backs of face stones to provide good tying throughout the wall structure.



**Figure 1:** Plan view of what typical two-sided wall structure should look like with face stones extending into wall core instead of along wall face. This feature of the masonry construction should be replicated in re-built face masonry of the cutwaters. The core should be composed of mortar-bound stone laid transversely to bind the centre of the wall together. As with a dry-stone wall the same principles apply to a mortared wall – the stone should be built in a structurally-sound manner as the lime, unlike cement, cannot provide structural support. (Image after McAfee 2009)

Minor and generally inconsequential destabilisation of a wall due to ground settlement can be exacerbated to more concerning levels by a lack of pointing mortar between stones which should be maintained to provide an effective matrix that transfers forces through the wall. Keeping the pointing mortar in good condition reduces the ingress of moisture into the structure which breaks down bedding mortar and can cause wash-out of fine material causing further destabilisation. Effective mortar joints also provide less opportunity for damaging vegetation to become established and thrive.

Capping and any pointing or consolidation work to historic masonry walls should use appropriate techniques and materials which are compatible with the retained historic stonework if the original structure is to be sustained in the medium to long term. This will mainly involve the engagement of a suitably-experienced conservation masonry contractor who will be familiar with matching the masonry style and appropriately weak lime mortar of the existing historic stonework when undertaking reconstruction of damaged sections as well as localised stone re-bedding to the wall-tops and pointing work.

## POINTING

The following methodology for localised replacement of loose or missing historic mortar joints will also be applied to the finishing of new reconstructed boundary masonry. New masonry should be initially built with mortar joints recessed back from the surface in order that pointing of the retained historic masonry and repaired new masonry can be undertaken in one operation using a consistent mortar mix and application technique.

1. Any existing open joints in masonry or where cracks have extended through masonry joints will be raked out manually by a depth of 2 ½ times the width of the joint or at least 25mm. These joints should be scraped out to ensure a solid, square-backed joint into which pointing mortar will be applied. All vegetation roots should be removed as completely as possible with masonry dismantled where removal of significant roots is required. Any remaining roots left within the structure should be treated with a suitable biocide and stumps filled with copper nails before being built over.
2. Begin **gently damping stone** with water, without soaking joints prior to repointing.
3. Mix dry mortar ingredients together first in a suitable paddle mixer or in small batches in the traditional large cement drum mixer. Ensure a well graded aggregate with no particle sizes more than 1/3 the width of the joints (ie. 6-8mm angular gravel) down to fine material. This will involve experimentation (analysis of surviving historic mortar to determine proportions of aggregate sizes and quantity and nature of lime binder), adjustment and mixing of **building, plastering sand and gravel** in the right proportion with lime binder. Add clean water gradually to mortar while continuously mixing. Added water should be kept to a minimum in order to

reduce shrinkage of mortar joints as they dry and to reduce splashing of surrounding stone during re-pointing works.

**Lime:** the binder used for both bedding masonry and pointing should be appropriate for the wall being repaired. It should set to provide a durable surface between individual stones that contributes to the structural coherence of the wall and facilitates the appropriate movement of moisture within the masonry. As a general rule, the mortar in joints should be considerably weaker and more moisture permeable than the masonry units; this means that any mortar containing cement is unsuitable due to its hard chemical set while a mortar containing only hydrated lime (such as White Rhino) will be much too feeble to serve any useful role. A weak natural hydraulic lime such as NHL 2 or 3.5 or a hot lime mix incorporating a proportion of quicklime with other building limes may be appropriate but a contractor experienced in successful use of any traditional building lime on similar historic structures is essential for these works and will be best placed to determine the most suitable lime.

4. Pack pointing mortar **right to back of joints** using appropriate width of pointing tools that enable mortar to be pressed in firmly to finish slightly proud of stone arrises without spreading it over the surface of surrounding masonry. Deep joints should be pointed in layers over the course of a number of days applying each new layer when the previous layer has been scraped back after having partially set to a 'green' state. Thin stones that reduce the width of the mortar joint and provide additional stability to the masonry are called pinnings and should be incorporated in the re-built masonry to best replicate the original masonry style. Pinnings should be good-sized pieces of stone pushed with their length into mortar joints rather than small chips pressed onto the surface of mortar joints.
5. Protect work as soon as possible after completing it using hessian sheeting regularly dampened and secured over masonry in order to control drying of mortar. No work with lime should take place if temperatures fall below 4°C and precautions should be taken (protective covers or insulation) to prevent damage to fresh lime mortar from extreme conditions of moisture, drying or freezing.
6. Pointing mortar surfaces should be scraped back lightly using a trowel when it has partially set at the 'green' or leathery stage. This is to remove the smooth, closed surface or laitance left by pointing tool ensuring proper access of air to the setting mortar. Joints should be **tamped back** after scraping with a stiff-bristled brush to remove any remaining pointing tool marks, to pack and closed small shrinkage cracks in the mortar. Protective covers should be replaced after brushing.

Facilities for pre-wetting joints before pointing mortar is applied and for keeping protective covers damp should be considered by the tendering contractor as control of mortar drying and shrinkage is often overlooked and can render the best pointing work ineffective if not properly planned. For larger projects, an automated damping system or dedicated personnel attending to the controlled drying of mortar should be made a requirement.

## MASONRY CAPPING OF WALL-TOP

A masonry capping to the wall does not involve the pressing of small stones into a thick bed of mortar on top of the wall as often seen on modern repair works in varying states of disrepair. Stones should rather be bedded horizontally to bring the wall-top to a consistent level with sloped faced stones chosen or cut to form the sloped top of the wall. Wall-top stones should be bedded to follow the same methods of masonry on the main wall where **vertical and horizontal joints are broken regularly and both faces of the wall are tied together** by the use of full-width through-stones and bond-stones which extend over half-way across the wall to overlap another similar stone on the opposite side. Care should be taken to **avoid wide joints or areas where water can collect** and penetrate the wall on the top surface. Stones should be bedded in a lime mortar based on natural hydraulic lime (NHL 2 or 3.5) with all joints pointed in order to direct water quickly off the wall-top surface preventing its accumulation and penetration into the core of the wall structure.

The following examples of similar historic wall capping should be used as reference for a durable new capping with a traditional appearance:



**Figure 2:** Example of constructed masonry capping to historic rubble limestone wall with sloped top surface built of triangular-shaped stones. Example shows weathered masonry, but joints should all be pointed flush with lime mortar to prevent pooling of water on wall-top. Note use of large stones to help tie wall-top faces together and retain stability.



**Figure 3:** Example of constructed masonry capping to historic rubble limestone wall. A slight overhang of capping beyond the vertical surface of the wall of approximately 30mm has proven to significantly reduce the effects of weathering on historic masonry walls.

The unavailability of sufficient rubble limestone to provide the constructed masonry capping shown above may require the construction of a simpler and less durable rounded masonry wall capping. This should consist of stones as large as available bedded in lime mortar to provide as much tying of the masonry faces of the wall-top as possible. A rounded profile to divert water off the structure as quickly as possible should then be built up over the wall-top using lime mortar with as much stone embedded within the capping as possible. All stone should be bedded horizontally rather than pressing small stones onto the rounded surface of the lime mortar finish as shown on an example of poor, modern construction shown below.

